FORUM

INDUSTRY 4.0
AND SUSTAINABILITY

LowCarbonCity

#SOSTENIBILIDADy4RI

THOUGTHS ON A SUSTAINABLE FOURT INDUSTRIAL REVOLUTION:

Inputs for decision makers and citizens

Taken from 4.0 Industries and Sustainability Forum
Medellín June 27 and 28, 2019.

INTRODUCTION

We hear about a 4th Industrial Revolution everywhere but still have trouble understanding its dimensions and significance. What are the explanations for this confusion? First, because it is arguably a revolution in process, it is still being created. Second, there are no common concepts or universally accepted universal definitions. And third, because it deals with diverse technologies that seem to be from the realm of science fiction.
Understanding this revolution as an opportunity for sustainable development is a new proposal, not only for the challenges that the technological advantages will bring, but also due to the inequality and social problems that it can generate.

For this reason we created the Industry 4.0 and Sustainability Forum as a way to profoundly reflect on the 4th Industrial Revolution and sustainability, focusing on the challenges, opportunities, and solutions available so that businesses, the social sector, and government can use these technologies for a more just and sustainable development path.

Through the forum, we achieved the following:

- Educating, closing knowledge gaps so that we have a common understanding when we refer to Industry 4.0.
- Finding and multiplying solutions for the challenges of sustainability, especially climate change, through the use and appropriation of these new technologies.
- Contributing to the construction of an agenda that links Medellín and Colombia with the 4th Revolution and the recently created Center for the Fourth Industrial Revolution through a viewpoint of sustainability.
- Connecting actors that work in this field to promote new projects and higher impacts.

Here we present the principal conclusions of the forum and open the doors to continue generating reflections and projects around technology with a purpose.

KEY FIGURES

136 Kg Electronic trash collected and recycled | **500** Attendees

44 Presenters from **8** countries | **7** Youtube Videos | **1** Networking space

8750 Direct Social Media Interactions | **6** Media Appearances

INDUSTRIAL REVOLUTIONS AND SUSTAINABLE DEVELOPMENT OBJECTIVES

We may not see steam engines anymore, consider the first cars, stop to think about a world without electricity, or consider computers or cell phones without the internet. But all of these radically changed our present lives, and are justifiably called revolutions

During the last 250 years three industrial revolutions transformed, and continue to transform, the world we live in. The changes have been economic, social, and environmental. They are not only changes in industry and not just technologies. And the changes haven't all been positive, but they have impacted all of humanity and the world we live in.

Today, technologies that until recently seemed like science fiction are becoming a reality in a Fourth Industrial Revolution (4IR). Think about how things that could only be seen on a screen can now be printed in 3D, how robots are coming to our businesses and homes, how many questions and decisions may now be the result of artificial intelligence, about what technologies can now be part of our own minds or bodies....all that and more is to think about the present and the future.

During the past industrial revolutions world wealth increased as never before. Benefits and conveniences that had previously been reserved for the rich were brought to all levels of society through new technologies.
Even so, millions of people still die from hunger every day, women work tirelessly, receiving less recognition and lower salaries than men, and quality universal quality education is still a work in progress. The costs of these revolutions have also been paid by thousands of extinct species, millions of acres of trees felled across the planet, and contaminated air and oceans.

The technologies of the Fourth Industrial Revolution thus present social, economic, and environmental challenges, but also offer opportunities to correct past errors and allow us to embark on a more sustainable path towards the future. One roadmap exits in the Sustainable Development Goals (SDGs) established in 2015 by the United Nations Development Programme (UNDP). Civil society, governments, the private sector, and citizens are called to take advantage of the opportunities that the Fourth Industrial Revolution offers to achieve these goals.

TECHNOLOGY GLOSSARY

ARTIFICIAL INTELLIGENCE

A set of technologies that permit processing massive quantities of data automatically, learning from them, and using those results to achieve specific objectives without any need for human intervention.

MACHINE LEARNING

Automatic learning is considered a subset of artificial intelligence. Machines are programmed to trust in patterns and inferences to make decisions. Through more data, machines make better decisions and selections.

AUGMENTED REALITY

Augmented Reality (AR) is an interactive experience where information generated by computers is superimposed on one's surroundings, sometimes through multiple technologies such as cellphones or visual lenses.

VIRTUAL REALITY

An immersive experience that gives the user the impression of visiting a distinct digital or filmed environment using specialized glasses.

AUTOMATION

The transformation of a process or procedure through digital technologies, with the goal to achieve them with the minimum amount of human assistance.

BLOCKCHAIN

Blockchain is to an incorruptible digital library of transactions that can be programmed to register and certify processes like financial transactions, contracts, or anything of value.

BIG DATA

Refers large data sets that are complicated to analyze due to their size.

INTERNET OF THINGS

Refers to a network of devices like vehicles and domestic appliances that have electronics, software, actuators, and connectivity that permit that them to connect, interact, and exchange data.

CONTEXT

INVITATION RUTA N: ALEJANDRO FRANCO, DIRECTOR

Science, Technology, and Innovation can be triggers of growth and improvement of quality of life, achieved in a sustainable and equitable manner. The challenges: 1. Attracting capital, talent, and businesses, 2. Developing a corporate and academic fabric with the potential to innovate, and 3. Solving the pressing challenges of the city with technology and innovation.

The Fourth Industrial Revolution must become a talent revolution. We must develop capacities to mobilize adolescents so they can connect with these vocations. Speaking about sustainability and 4IR has to turn into solutions and employment for the city.

THE HARMONY BETWEEN INNOVATION AND TECHNOLOGY: JORGE SANTOS, REPRESENTATIVE, GRAN PACTO POR LA INNOVACIÓN

Science and Technology are leverage for the ideas that we want to promote. The role of innovation is to transform the growth that is being generated in resources and well being. What to do with new emerging technologies? The answer is to transform them into competitive advantages for businesses, close gaps, and generate solutions for social and environmental challenges. The 4IR gives us tools to manage data. The challenge is to use our talent so that data that we didn't have before can be used to our benefit.

TECHNOLOGICAL ADVANCES FOR THE 4TH INDUSTRIAL REVOLUTION: GABRIEL ANGULO, DIRECTOR OF DIGITAL TRANSFORMATION: MINISTRY OF ITC (INFORMATION TECHNOLOGY AND COMMUNICATION)

The priorities of the National Development Plan of Colombia are: 1. ITC environment for digital development 2. Citizens and homes empowered for the digital environment 3. Social digital inclusion 4. Sectorial and territorial digital transformation.

The TIC law project was approved by Congress to reach coverage of 90% of the country.

There are 4 CONPES documents in progress on digital transformation, artificial intelligence, e-commerce, and digital security.

CONSTRUCTING SUSTAINABLE CITIES AND RELIABLE GOVERNMENTS WITH THE HELP OF DIGITAL TECHNOLOGIES

Contexto

- World governments lose 5 trillion USD because the secretaries and ministries don't communicate between themselves.
- 9 out of 10 government employees don't have the tools to work.
- 50% of people don't trust the government.
- In 2020 there will be more than 50 billion devices connected to the cloud.
- The planet is 4.6 billion years old. If scaled down to 46 years, this means human beings have only been on the planet for 4 hours, and during the last minute, which brought the industrial revolution, we have used 50% of all natural resources.

Principal Idea

Everything that happens in the city can be turned into data, filtered, and transformed into information to make decisions on the challenges of sustainability and given to governments so that they can speak the same language and connect. For example, matters of air quality, aqueducts, security, health, public services, employment and urban development can be understood through the internet of things (sensors), artificial intelligence (analysis and prediction of data), and blockchain (secure and reliable information).

If we decentralize trust through tools like blockchain, we can permit efficiency in tax issues, promote financial access to "unbanked"communities, return to the exchange of community money, and promote citizen participation in the infrastructure solutions of city.

To continue the conversation

- New digital technologies and open source development can allow trust to be regained.
- Digital technology does not only involve technology but also our form of thinking in terms of how we can use it.
- If we want to be a more sustainable city our habitants have to be the most sustainable.
- Technology will not solve our problems, but will help and have an enormous impact on the public sector.

JESÚS CEPEDA

Co-Founder and director of OS City, a leading organization in the implementation of artificial intelligence and blockchain in the Latin American public sector. They are focused on the future of cities and their sustainable growth. He has a doctorate in artificial intelligence and robotics and has been an entrepreneur in civic technology software development for the last 10 years. He is a member of the highly selective Program of Global Solutions at Singularity University and is focused on applying exponential technologies to find impactful solutions for global challenges at the NASA Ames Research Center in Silicon Valley.

"I remember my mom telling me, don't get in a stranger's car...now I take an Uber, don't enter a stranger's house...now I use Airbnb; to decentralize trust, trust in what others say. That's how we have evolved."

11 SUSTAINABLE CITIES AND COMMUNITIES

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INPUTS FOR THE DESIGN OF PUBLIC POLICY FOR A SUSTAINABLE 4TH REVOLUTION

What is the Fourth Industrial Revolution?

It is a moment of convergence between information technology, biotechnology, and new industries that can align to transform the status quo, that can be built by everyone and involve everyone and this is still being built. This fourth revolution is accompanied by the knowledge and focus on human beings, their future, and what will happen to newer generations

What are the risks?

It is often said that technology can displace people from their work. Without a doubt, these technologies can simply life, and we as a people need to teach the machines what we want and make decisions with the data that the machines generate.

Each industrial revolution evolves and generates new opportunities, the opportunity is to leave the fear and change habits, and Industry 4.0 can help us learn about people's habits, generate data, and promote sustainability.

How should these issues be regulated?

We are experiencing changes so rapid that they are difficult to regulate. Normally regulation is used to define routes of development, but this time it is consumers, entrepreneurs, and other private actors who must create the mechanisms and form working groups to create the necessary regulation.

What role do ordinary citizens play?

We live in the highest moment of technological connection, but in the worst moment of human connection. Awareness is required to learn and also to contribute. This theme touches us in our day to day lives. The future is collective.

17 PARTNERSHIPS FOR THE GOALS

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PARTICIPANTS:

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Director of Digital Transformation
MINTIC

JESUS CEPEDA
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GLORIA SALAZAR,
Manager, Sistemas Inteligentes en Red

Moderator:
JULIANA GUTIÉRREZ, Director,
Low Carbon City

HOW CAN WE IMPLEMENT AI AND MACHINE LEARNING TO SOLVE SOME OF THE BIGGEST CHALLENGES FACING SOCIETY?

Context

Artificial intelligence is a technology that can help people and organizations to make better decisions through processing advanced and massive data sets. It can generate recommendations, make precise decisions, and process complete information in a more effective manner.

AI is not something entirely new, rather it is part of the historical process of the formalization of human thought. Since the 80s, and with advances in computation, research into AI moved quickly and in the 90s a computer program superseded human capacities for the first time, in this case playing chess.

Principal Idea

Now these technologies are being applied to address the challenges of sustainable development, below are some examples:

Determining which plant varieties are best suited for an area, which capture the most carbon, and where are the optimal locations to place them. This process that used to take years of human investigation can now can be done in a short amount of time, thereby helping us address a subjects like climate change.

Analyzing vast sets of economic and labor data to better orient individuals and give more information to decision makers in businesses; AI seeking to generate more happiness and a higher quality of life for workers.

AI can be used to process satellite data in order to geolocate and better understand our environment. This permits, for example, us to determine the risk areas for disasters, saving lives through the prevention and increasing the efficiency of responses during an emergency.

Ideas to continue the conversation

- These technologies advance in a rapid manner, and preparing for these changes is an effort.
- The challenge will be to accompany the changes AI brings by forming teams and individuals with the necessary knowledge and capacities.
- Achieving synergy between the human element and the capacities of artificial intelligence is the best scenario to put technology to good use.

MICHAEL WITBROCK

Dr. Michael Witbrock co-founded The AI for Good Foundation. The foundation supports the Sustainable Development Goals by constructing sustainable communities that provide the best technologies to confront the world's most important challenges. Dr. Witbrock brings more than 20 years leading AI research in academia and the private sector, in the automatic acquisition of knowledge through text and dialogue, automatic reasoning, and intelligent interaction between people and computers. He has worked with institutions like Carnegie Mellon University, IBM, Cycorp, Just Systems Pittsburgh Research Center, served as a consultant to the European Commission, and is currently a professor at the University of Auckland.

"The role of artificial intelligence should be to increasingly contribute to sustainable development, and in general contribute to the development of a good, just, and sustainable civilization."

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RESOLVING GLOBAL SUSTAINABILITY CHALLENGES WITH THE HELP OF ARTIFICIAL INTELLIGENCE

How to understand Artificial Intelligence?

Artificial Intelligence is a computation system that can perform work that normally requires human intelligence, but now can be done automatically due to its capacity to process large sets of data..

How is AI being used for sustainable development and what are the possibilities?

AI is already being used in many spaces in the world to improve people's lives, the making of decisions in public and private institutions, and to apply its uses to subjects like the preservation of the environment or public health.

Thanks to the analysis of health data AI allows us to identify individuals that are at higher risk in order to help in the prevention and avoidance of illness. This presents a paradigm change that allows us to think of the healthcare system not as a business of sickness but rather one of prevention.

What risks and challenges have been identified?

AI can have negative consequences, but only if the data which we are working with is biased at the beginning. The challenge for us is to identify the biases that exist in our manner of capturing data and the our preconceptions in order to avoid them in AI systems.

The changes that artificial intelligence will bring are difficult to determine but will come rapidly and as the majority of people will have reticence towards these changes, it is important to accompany and educate the population so that the positive potential of the technology can become a reality.

AI will arrive in a way that the information that it provides will challenge us to make these technologies behave more like us and to integrate morality or considerations of human dignity so that communication we have between us and the machines integrates these values.

AI will not replace abilities or individual employees but will rather take the general capacity of humans and integrate with machines. The principal challenge as a society will be resignified in front of these changes to the value of being a human being, giving it a value per se, preserving the necessities and comforts that humans need so that when these changes come they can contribute to the wellbeing of everyone.

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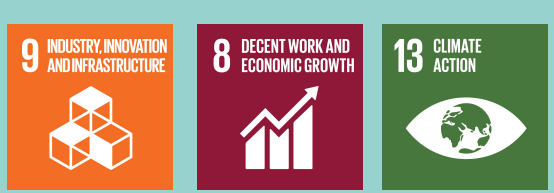

THE ROLE OF WOMEN IN INDUSTRY 4.0

How can the Fourth Industrial Revolution affect/benefit women? What opportunities exist?

The 4IR, along with gender equality, are macro trends. People around the world are talking about including women in the labor market and different economic systems. In that order of ideas, the 4th Industrial Revolution appears as a bridge for that transition and because of this it is vital that women are involved in the creation and development of these tools. This is so that they can not only resolve the necessities that we have as a society, but also so they can reduce the gender gap.

Why are women underrepresented in specialized fields of work?

There are a large number of challenges and barriers that limit the participation of women in areas like science and technology. This phenomenon is due to mental biases, a lack of systems of effective assistance, and centuries of evolution in which the role of women has not been very dynamic. On the other hand, it is evident that that paradigm has been changing little by little and it is time to accept the genetic and neurobiological changes in the minds of women that each day push them to create a break with the establishment and create their own transformations in the social, cultural, and academic worlds.

What methods exist so that women, especially those without access to formal education, can access STEM knowledge? What examples can you provide?

The first step to involve STEM (Science Technology, Engineering, and Math) knowledge with women who have little or no access to this information is to develop approachable language and leave technical terms to the side. For this we need translators to bring this language to different contexts, nurture human connections, and facilitate understanding.

Similar to this, technology as a tool can help generate changes, facilitating self-training, and bring it to zones that are normally not connected.

Great examples of both strategies are the projects of Pioneras Dev and the Observation of Women's Studies and Management by the government of Antioquia.

PARTICIPANTES:

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Secretary of Women,
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Manager of Social Management and International Relations, Comfama

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10 REDUCED INEQUALITIES

EDUCATION, INCLUSION, AND DIGITAL TALENT FOR THE CHALLENGES OF INDUSTRY 4.0

Why is digital talend associated with the Sustainable Development Goals?

Digital Talent and SDGs converge because the people who develop technology must focus on how to integrate it with the industry and environment in order to develop solutions to the problems most relevant to human beings' lives (diet, clean air, etc…).

The past industrial revolutions destroyed the environment. So that this doesn't happen again, the biggest responsibility of the 4IR is to integrate the aspects of life and well being. Education is very important for this, as digital talent must be well educated, but the educational system is not prepared.

What are the competencies for this education?

The most important capacity in the 4IR is the capacity to learn regardless of a person's profession.

It will be important to have competencies in coding and technology but the most important will be human competencies, like working in teams and across sectors, resolving problems, communicating, and empathy. These are the things that machines cannot learn how to do. The creative component of human beings will generate value because mechanical work will be done by machines.

What are the challenges for digital talent?

Even if we train people so that they have the necessary technological competencies for the 4IR, the question is, what jobs are we going to put them in? Can we generate work for all these people?

Whatever the profession, nobody in the future will have a stable career. Although futurists say that there will be 12-14 new professions, the bad news is that many people will not have stable jobs those that exist will be short-term. Given this future, it is important to rethink our politics and perceptions because economic benefits and professional status are currently based on stable jobs.

Is there a potential to generate employment for historically excluded populations? (disadvantaged, rehabilitated, victims, women)

Yes there is a potential, provided that education focuses on these populations, as well as creating innovative spaces for learning and new jobs in the sustainability industry.

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Modera:
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Green Talent

8 DECENT WORK AND ECONOMIC GROWTH

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DEMOCRATIZATION OF TECHNOLOGY AND DIGITAL CITIZENSHIP

What is digital citizenship?

Providing citizens with digital tools that permit: a. Expression in digital and physical spaces mediated and helped by technologies, b. Sharing and consuming information, and c. Collecting the information that the city generates.

What are the challenges of 4IR technology for citizens?

- The potential of computing, helped by AI and sensors, allows the collection off different kinds of data about people. The ethical use of this data will be a fundamental challenge.
- The accessibility of technology is not generalized, and digital illiteracy is common. For this reason it is necessary to promote education and general knowledge from an early age in order to learn the functionality and use of these technologies.
- The generation of data and how people interact with it is crucial. Technology procured through open documentation, software, and design, that facilitates the capture of data especially for sustainable development and how to improve citizens experience in their own city is crucial.
- The majority of technologies use languages based in English. Bilingualism from an early age will facilitate access to technology.
- Defining mechanisms to accompany communities with appropriate technology.

How can citizens take advantage of new technologies to achieve the goals of SDP?

Joint Responsibility. Informed citizens are necessary for a sustainable city.

Building together is a challenge. It is important to have co creation of the government with citizens and businesses. Generating alliances in favor of citizens. Forming means of communication in order to diffuse information. Understanding sustainability as the development of capacities that permit the development of actions in territories and generate projects with the communities.

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11 SUSTAINABLE CITIES AND COMMUNITIES

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UNDERSTANDING INDUSTRY 4.0 AND SUSTAINABLE CHALLENGES TO BE SOLVED

Why link entrepreneurship and sustainability?

Businesses are a link to solve problems. Global systems are failing and businesses must choose what type of problem they want to resolve at the planetary level and work on it as part of their business.

Entrepreneurs are agile, and have the capacity to innovate and develop new ideas pragmatically. If entrepreneurs have the capacity to take tools of the 4th revolution and put them in service of the environment, it is possible to find models of sustainable business through economic, social, and environmental themes.

We are coming from a social and economic model that does not function and entrepreneurship is called to change this model. We are in a process of transformation of society through I, through us, and it is not a change in technology but the form in which we address many goals, which will be collective and technology will facilitate many of these processes.

The previous revolutions used an excessive amount of resources, and today in the context of climate change and the exhaustion of these resources sustainability is a critical point for the growth of business to fix their vision, not only inward looking but also outward with respect to the impact they want to have on society.

What recommendations do you have for other entrepreneurs?

Reframe the word sustainability to not refer to what we don't want, for example contamination, but rather deal with it in terms of positive impacts that it can generate.

Create businesses that from their beginning have a vision that considers sustainability. Bring it close to a vision of conscious capitalism, that is preoccupied with social themes, employees, and the environment.

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Co-founder, Ecoral

"In the 4th industrial revolution art and medicine, among other fields, will converge with technology and vice versa. Citizens have not realized the power that technology gives them and this is a starting point." -Maria Clara Choucair

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

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REAL SOLUTIONS TO REAL CHALLENGES: CASES

EMERGING TECHNOLOGIES APPLIED TO SUSTAINABLE MOBILITY

Project

Intelligent Systems of Transportation, affiliated with ISA, created the System of Transit Control, in which the incorporation of technology like virtual reality, augmented reality, internet of things (sensors), artificial intelligence, machine learning, drones, and apps, makes decisions on traffic of the city. It analyzes the information and gives it to the city and its citizens.

Benefits

- Reduce accidents
- Reduce travel times
- Measure and reduce emissions
- Promote sustainable mobility

ROBERTO URREA
Sistemas Inteligentes en Red

11 SUSTAINABLE CITIES AND COMMUNITIES

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METHODOLOGY OF PUBLIC-PRIVATE INTERVENTION BASED ON INCLUSIVE INNOVATION AND SUSTAINABLE BUSINESS

Project

The foundation PuntoGov is a civil organization created to contribute to the digital and technical development of Argentina. We promote Information and Communication Technologies in the public sphere, aimed at improving people's quality of life and the generation of opportunities for human, economic and social development.

We focus on the resolution of social problems using ITC in the public sphere through collaborative networks of high technology and formulas for effective cooperation. We promote the strengthening of institutional capacities and strengthening through strategic communications the potential of ITC for social change in areas like health, education, urban mobility, sustainable development, citizen processes, and vitality.

SABRINA DIAZ
Director, PuntoGov

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

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"We connect the biodiversity of genetic resources with high value productive chains that benefit local producers through science, knowledge, and technology."

REAL SOLUTIONS FOR REAL CHALLENGES: CASES

MEDATA: OPENING, APPROPRIATION AND USE OF PUBLIC DATA IN MEDELLÍN

Project

MEData is the strategy of open data from the City of Medellín that looks for the appropriation, opening, and use of data. This platform is part of a bet to construct a more intelligent city that gives precedence to two components: the data driven economy or an economy based on data that helps to propel the innovation of the city through public data, and the construction of a system of innovation in the city full of "informed and intelligent citizens"

Lessons Learned

- Open data is fundamental to modern cities.
- It is vital to invite other sectors of society to utilize public data in making their decisions and share the data of interest with citizens.

ELIANA MONTEROSA
Strategic Leader, MEData

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

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ENCOURAGING DEVELOPMENT IN COMMUNITIES WITHOUT ACCESS TO ENERGY THROUGH MICRONETWORKS BASED ON BLOCKCHAIN

Project

According to the IPSE, 52% of Colombia is not connected to the electric grid. Because of this Cycle, a start-up that promotes development in communities without access to electricity through micronetworks based on blockchain, was born.

In other words, this system permits habitants of isolated communities to be prosumers (producer and consumer) of renewable energies, where through a platform based on blockchain they can carry out the different transactions they need.

Lessons Learned

- Politicians and entrepreneurs should constantly converse to generate an ecosystem of innovation.
- The 4IR can help us to create and attract modern energy models to the country.
- The use of technology should be simple to be able to involve communities and to be a motor of development.

NICOLÁS CUADRADO
Co-founder and CTO of Cycle

7 AFFORDABLE AND CLEAN ENERGY

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REAL SOLUTIONS TO REAL CHALLENGES: CASES

PEER TO PEER MARKET SOLUTIONS

Project

Climate Blockchain Initiatives has as an objective to boost funds and capital towards impact enterprises. Its value-added consists of a blockchain platform that provides transparency to transactions and prevents the double-counting of the projects of carbon markets at an international level.

Lessons Learned

- The solution for the climate crisis will not be charity, and for this reason every project or initiative related to climate change must involve a matrix of economic, environmental, and social impact.
- In today's world the companies that contaminate the environment have the opportunity to compensate for their emissions generated. With the help of the 4th IR this capacity will be extended to further actors in society such as families and individuals.

JOSÉ LINDO
Co-Founder
Climate Blockchain Initiatives

13 CLIMATE ACTION

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ECOREGISTRY: A REGISTRY PLATFORM FOR EMISSIONS, TRACING AND CANCELLATION OF CERTIFICATES OF REDUCTION OF EMISSIONS

Project

XM, affiliated with ISA Group and the analytical data startup Latin Checkout, created EcoRegistry, a system of registry for the voluntary carbon market in Colombia that brings traceability, confirmability, and robustness through a blockchain platform. This platform permits the guarantee of the integrity of information, simplifying processes and reducing the costs of transactions in the voluntary carbon market.

Lessons Learned

- According to the OCED "Carbon markets are the most cost-effective method to achieve the objective of fighting climate change"
- En la actualidad es vital utilizar la tecnología como una herramienta para disminuir las fricciones y costos transaccionales de los diferentes procesos i
- El mercado de carbono colombiano es robusto, estable para transar y referencia a nivel internacional.

JUAN DAVID DURÁN
Innovation Leader
XM, Filial de Grupo ISA

13 CLIMATE ACTION

VER VIDEO

CHALLENGES AND OPPORTUNITIES FOR BLOCKCHAIN IN CLIMATE GOVERNANCE

What is Blockchain and what sustainable developmental challenges can it help to solve?

According to the OCED, “blockchain is a technology that looks, in different ways, to redistribute economic and political power and surpass boundaries.”

In simple terms, blockchain is a database shared and distributed to avoid corruption, thanks to the mechanism of “blocks” chained so that they are more difficult to corrupt. Some of the virtues that blockchain brings to climate action include avoiding the double counting of mitigation projects, mobilizing more capital for climate finance, and strengthening the monitoring and verification of climate change projects, among others.

What is the competitive advantage that blockchain offers in comparison to other tools of the 4th Industrial Revolution?

Blockchain is a very versatile tool, that in it’s principal advantage brings security and confidence. For this reason it is much more easily articulated compared to other technologies like IOT, Big Data, Machine Learning, etc. In fact, we currently can show large projects of integration between blockchain with other developing technologies in fields like electric mobility, financial systems, and forest monitoring among others.

What are the principal challenges to expanding initiatives based on blockchain? What is being implemented to solve these?

Blockchain, like every existing technology has many areas it can improve. The case of electricity expenditure is without a doubt the most relevant in relation to climate change, as when designing an algorithm it needs large amount of mining centers that constantly demand energy.

On the other hand, there are those who are proposing solutions to these challenges, such as designing chains at local and community scales (leaving aside big energy savings, moving mining centers to countries with the best energy supplies), improving the algorithm in a manner that uses as little energy as necessary, and not storing memory in inefficient data sets (which decreased current energy consumption), among others.

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Moderator: ORIANA BALLESTEROS
Project Coordinator, Low Carbon City

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“Blockchain, among other technologies, generates confidence between climate actors, creates mechanisms that incentivize climate action in a way that’s accessible to the least privileged people, and supports the mobilization of green financing..” ONU

ROBOTICS IN SERVICE OF SDGs

Context

“Robotics and intelligent automation could help communities improve their quality of life and contribute to sustainable development. The dynamic of the 21st century presents a great variety of challenges that will require that collaborative education to be the nucleus of knowledge production and technological innovations. Robotics for sustainability could develop through a combination of classic technology and sustainable and new methods of application.”*

Is it true the robots will replace humans?

Humans can’t be replaced by robots because the brain is irreplaceable, although without a doubt certain human activities can be replaced. To be human is to create and think. What is important is to change the imagination, robots serve as a tool to facilitate work rather than replace humans.

How can robots be of use in the context of SDGS?

From assisting on patient surgeries to contributing to forced or dangerous work that people can’t do.

- Pygmalion has impacted more than 50,000 children and young people in subjects like robotics and education in Colombia. Robots that can be assembled by children.
- The foundation Marina Orth works with children, adolescents, and teachers through robotic education.
- The UPB has worked in the development of robotics for exploration, generation of information, conservation, and sustainable uses of the ocean. More than 80% of the sea bottom is unknown. Through robotics we could discover the 46% of the territory of Colombia that is marine.

* A role for robotics in sustainable development.

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COMMUNICATING SUSTAINABLE DEVELOPMENT THROUGH VIRTUAL AND AUGMENTED REALITY

What is Virtual Reality and Augmented Reality?

Virtual Reality (VR) permits the experience of moving in a completely new space, that can be designed or filmed in a vision of 360 degrees. Augmented Reality (AR) uses platforms like smartphones to put digital content on top of the reality in which one moves around, integrating data, entertainment, or whatever additional interaction with the real world. They are technologies in evolution that have existed for a few years, and in becoming more affordable are increasing their impact.

What do they do and what can they do to communicate sustainable development and sustainability?

The form in which we tell stories about sustainability is essential, today the problem is to bring these complete themes to the people on the street. The advantage that VR offers over other mediums is its capacity to generate more empathy. Although data is important, so is telling striking stories through an immersive experience, and VR allows the public to better integrate the information and the message. The reception of information that is passed through speaking is around 5% compared to almost 70% in VR simulations.

By generating empathy these technologies serve to raise awareness of environmental subjects. For example the experience that permits a viewer to see a bear close up in a visit its environment, or to be an endangered species in isolated territories is a way to raise the consciousness of the public on this theme. Other examples include the Justin Beaver experience by Alexandra Sierra that allows the viewer to experiment being a beaver hunting victim, or the virtual reality project Tree, which turns people into a tropical tree to tackle the problem of deforestation.

What opportunities are being created for education in sustainable development?

We can contribute by communicating complete knowledge, particularly scientific knowledge, in a clearer manner to educate the public and specialists. These technologies permit us to go directly to knowledge acquired at a distance, thus connecting us to territories that were originally disconnected. AR is available in applications that can be utilized to democratize learning and can be consumed like entertainment enhance public impact.

Other advantages of VR and AR.

By generating empathy they can contribute to the management of resources, for example the case of natural disasters.

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CLOSING THE GAPS IN RURAL AREAS THROUGH DIGITAL TECHNOLOGIES

What are the challenges that can exist in rural areas today that technology can solve?

- Low levels of technological literacy, or the inadequate use of available technologies.
- Little connectivity and little interest by public and private sectors in improving this connectivity.
- Gaps between supply and demand of agricultural production.
- Generational replacement, as children don't want to do the same thing as their parents.
- Lack of historical presence of institutions in the territories and lack of trust on the part of the population.
- Agricultural development through unsustainable models (agrochemicals, deforestations, buring).

What benefits can the new technologies bring to sustainable rural development?

- Bringing together actors can permit organization in front of institutions and can empower the population to influence their governments.
- Permitting the uniting of resources and interchange of experiences to create more opportunities for small producers.
- Better connection cities with the supply and demand of agricultural products.
- Long distance capacities and access to specialized services, for example, the advice of agronomists or telemedicine.
- Strengthening the value chain thanks to sensors, geolocation, and other technologies that permit the improvement of decision making and production performance.
- The learning of new technological tools will make agricultural work attractive again for young people.
- Reestablish confidence in institutions by generating economic benefits for populations.
- Allowing us to accompany communities to create a true valorization of ecosystem services thus helping the conservation and low carbon rural development.

Lessons from our experiences:

- Technology cannot be an end, it must be a means of appropriation and empowerment for rural populations.
- All problems have adaptive solutions, geolocalization and blockchain can fulfill their role of certification and traceability of products, but sometimes a simple group on Whatsapp can have a great impact in improving production.
- Tokenization can permit tourists to take responsibility for their emissions in ecosystems in danger.

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MESSAGES FOR CANDIDATES FOR PUBLIC OFFICE AND DECISION MAKERS

- To create an innovative city, community, and country, it is necessary to co-create legislation between the branches of power, businesses, and entrepreneurs.
- To change the current paradigm, the public sphere is not something owned by the state, it is something that belongs to everyone, from ecosystems to public spaces. The efforts of the government and institutions can only be effective if they focus on the public good.
- Whoever is elected or wants to incorporate in their campaigns themes of intelligent cities can count on the MinTIC to implement these types of technologies in the fields of development and law.
- Political will is required to integrate capacities in territories and create technological appropriation. This goes beyond guaranteeing access technology to creating a models of long term public management that will allow users to learn how to use and apply technology in an adequate manner.
- In the face of the rapid changes that these technologies generate we must remember how slow change can be for human beings. The role of government facing artificial intelligence must be to adapt its institutions to these changes, first by self development, second constructing a public policy strategy like other countries have done, third taking advantage of the advantages it brings to better understand and model its policies.
- The goal of citizen science is to advance public policy.
- Making a conscious effort to reach communities in need and bring organizational opportunities, so that the students of today will become the creators of technology, especially in elementary and middle schools.
- Each city is a different context, so to create a startup community, it is necessary to generate facilities so that academia, the private sector, and the public can converse in the creation of new technologies. That is the great challenge that leaders face.
- In Colombia there is an ecosystem of innovation, but what is lacking is the accompaniment of the public sector to take a leap of faith with the private sector, so that the risk is shared and not only the results.

FOOTPRINT MEASUREMENT

At Low Carbon City we are conscious of the impact that the organization of an event can have on our planet, and for that reason, since 2016 we measure and compensate for our emissions.

In alliance with our technical allies **INCYCLO** we measure the carbon footprint of the event. The compensation for this footprint is done with our allies at **CLIMATE TRADE**.

Therefore, we certify that the 4th Industrial Revolution and Sustainability Forum was carbon neutral.

We invite the organizations interested in this type of measurement and compensation to reach out to us.

INCYCLO
ASESORAMIENTO AMBIENTAL & SOLUCIONES OPERATIVAS

climatetrade

APPRECIATION

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