Data Economy and Artificial Intelligence in Latin America. Opportunities and Risks for a Responsible Use.

Constanza Gómez Mont, Claudia May Del Pozo,
Ana Victoria Martín del Campo

This report was developed by C Minds and commissioned by the Technology and Society Studies Center (CETyS) of the University of San Andrés in Argentina.

Collaborators:
Cristina Martínez Pinto and Andrea Barenque

Research Assistants:
Will Boggs and Adrian Kopps

With thanks to Jack Hardinges, Public Policies Advisor at the Open Data Institute (ODI), for his input.

CETyS Universidad de San Andrés
In collaboration with: fAIr LAC | BID Banco Interamericano de Desarrollo

Abstract

The Fourth Industrial Revolution (4IR) entails unavoidable socio-economic changes for all countries. This report goes over the origin of this paradigm, explaining the essential role of data and analyzing the current scenario in view of a new technology: Artificial intelligence (AI).The report ponders on data economy and lays the foundations for the reflection about the potential of AI for the impact, classifying the intrinsic and extrinsic risks of its implementation. Finally, it gives examples of best practices that address the challenges that come with AI and promote its responsible and ethical use.

Key Concepts

Artificial Intelligence
Data, Data Economy
Risks of AI
Ethics
Responsible Use
Latin America

Preface

This report is part of a project of the Technology and Society Studies Center (**CETyS**) of the University of San Andrés in Argentina, funded by Facebook, whose goal is to create a series of documents that make it possible to consolidate the foundations for the reflection and the implementation of principles and instruments for artificial intelligence (AI) policies, focusing on the challenges and opportunities from a socio-economic and ethical point of view in the context of Latin America.

Through this report, greater knowledge in Spanish and capacity in Latin America are expected be created to take advantage of the new dynamics of the digital economy. The authors seek to contribute to a current discussion about the opportunities that data economy and AI bring to the region, addressing the challenges that should be considered in order to turn academic discussions into incidence and actions by governments, companies and the civil society.

Even though the region faces specific challenges, it is worth stressing that, for the most part, the challenges posed by the digital economy and AI are shared by many countries in their pursuit to make the most of and democratize the benefits of the Fourth Industrial Revolution, in order not to lag behind in terms of competitiveness. From the perspective of C Minds, it is vital that these conversations be anchored in the importance of responsibility, ensuring a use of the new digital technologies, such as AI, focused on human rights.

The C Minds team firmly believes in technology as a tool to build social value. We are committed to a responsible AI that drives the development of Latin America, and we hope that this report will inform decision-makers in order to advance the necessary conversations and actions towards the use of data.

Constanza Gómez Mont,
Founder and CEO, C Minds

1 Introduction

It is said that mankind will change more in the next twenty years than it has changed in the last three hundred years[1]. Every industrial revolution entails changes in the structure of the global economy and new rules for the production, distribution and consumption of goods and services. In the last ten years, society has seen significant advancement regarding the development of disruptive technologies and the emergence of great amounts of data that have laid the foundation for the beginning of the Fourth Industrial Revolution (4IR)[2].

In this new evolution, the implementation of sciences, such as mathematics and statistics, together with progress in data collection, storage and processing, have boosted the development and implementation of artificial intelligence as a tool to transform the different industries and sectors. According to experts, the impact of AI is

1 According to Gerd Leonhard, Keynote Speaker on www.futuristgerd.com

2 "Industrial revolution" is the name given to the great social transformations brought about by technological advancement and scientific development. The first industrial revolution took place in the XVI Century with the steam engine. The second revolution was in the XIX Century with electricity, the automobile and the oil industry. The third industrial revolution began in 2000 and it is characterized by progress in aviation, electronics, cybernetics and atomic energy.

equivalent to the one electricity once had, which has exerted a widespread effect on the tools and devices we use on a daily basis and, therefore, on people's lifestyle and life quality (Smith, 2019). The AI holds the promise of great benefits for the public and private sectors in terms of efficiency and competitiveness; it is estimated that this technology may add from US$13 (Chakravorti et al., 2019) to US$15.7 Bn. (PricewaterhouseCoopers) to the global economy by 2030. By and large, those countries that opt for investing in AI might see their economies grow 25% more than the countries that do otherwise (BID, 2018).

The world has reached a critical turning point for the social transformation that stems from technology innovations, the accelerated technology change and globalization. Even though the tip of the iceberg is barely visible when it comes to new opportunities, we can also have a glimpse of some of the risks resulting from the use of these technologies. That is why it is vital to prioritize a responsible advancement to protect society from the risks that come as a consequence of data processing using AI and the possible negative implications of the adoption of this technology.

We need to ask ourselves how the society, the industry, the academic world and governments can leverage and participate in the digital economy, taking advantage of the benefits of AI, and, at the same time, guarantee the respect for human rights and an inclusive and safe transition to the 4IR.

In the face of that question, this report goes over the transition to a digital economy and puts forth a broad picture of data economy globally and within the context of Latin America. Moreover, it analyzes the risks and challenges that stem from the development and implementation of AI and it presents international best practices for its responsible use.

2 The Digital Transformation

Context - Digital Economy and the Fourth Industrial Revolution

On the basis of digital economy is the Digital Revolution, or Third Industrial Revolution, which took place between 1950 and 1970. During those 20 years, a great number of analog and mechanical technologies became digital thanks to the adoption of computers and digital files, bringing about a dramatic change in the way we communicate, work and, more

generally speaking, the way we live. From then on, all the activities carried out in the digital world, whether form a social or a business perspective, started to leave a mark in the form of data. In parallel to this data generation, machines were developed that could store them and others that could process them. The added economic value created by the storage, access and analysis of this big volume of data, at high speed and boosted by the use of internet, ushered the digital economy (Digital Realty, 2019).

In 2011, years after the Digital Revolution, the term 4IR was coined, in which a great amount of data accumulated over previous decades, faster processing speeds and unprecedented storage capacities converge to bring life to new digital technologies in which the physical, digital and biological worlds merge (World Economic Forum, 2019). This revolution, just like the ones before, is changing the models of production, markets and the creation of new products, affecting all the sectors and even challenging what it means to be human.

It is estimated that, by 2030, Latin America might have increased its GDP by 5.4% due to the influence of AI (Ortmaetxea, 2018), a reality that requires a strategic preparation which is, partly, already under way. Indeed, most of Latin America has laid some of the foundations to take advantage of AI as 70% of the countries in the region have a national digital strategy, according to internal sources at C Minds.

At present, data is a byword for creation potential and value acquisition. Amy Webb, founder and director of The Future Today Institute and author of the book The Big Nine, compares data to oceans in the sense that they surround humans and are an endless resource, but they are useless until they have been treated and processed for their consumption (Webb, 2020). Data allow companies and governments to understand their customers and citizens better, identifying new opportunities for the provision of private or public services which, in turn, translate into strategic information for decision-making.

There are different sources of data, from governments to companies and people. Following the Digital Revolution, many governments have joined the movement of Open Government that, to some extent, implies opening up sets of data from different agencies in open data portals. In 2019, at least 75% of Latin American countries had an active portal[3], contributing to the wealth of regional data, but only 65% of them had a formal data strategy in their public policy agenda[4]. Mexico and Chile are leaders in this issue in the region, and they among the top 25 countries in the Open Data Barometer[5] of the World Wide Web Foundation, together with Brazil, Argentina and Uruguay, which are in the 28, 31 and 14 positions, respectively, on the Open Data Institute ranking in terms of disclosure of government data[6].

Part of the data generated by individuals is called "data exhaust". They are collected in a passive way from individuals' everyday interactions with digital products and services such as cell-phones and credit cards, just to name a few examples[7]. It includes the use

3 According to internal analysis.

4 According to internal analysis of C Minds.

5 World Economic Forum: www.weforum.org/

6 The Open Data Institute: theodi.org/

7 Information obtained from Big Data for Sustainable Development United Nations. Available on: www.un-.org/en/sections/issues-depth/big-data-sustainable-development/index.html

of email systems, search engines and social networks (it is estimated that one out of three people in the world uses a social network)[8], generating huge amounts of data every day.

On the other hand, companies gather invaluable amounts of data by offering their products and services. In the last years, there has been an interest in encouraging the openness of data from the private sector, fighting the phenomenon of data deprivation (Serajuddin, 2015). In fact, data from the private sector, combined with data from the public sector, might provide a comprehensive outlook about different topics such as mobility, energy or finance, to name a few, reducing the monopoly of data and enabling the creation of new solutions for consumers. Some initiatives, for example the Consumer Data Rights Initiative of the Australian government, seek to enable the sharing of data among authorized agents and to give control of data back to users, starting by the finance and energy sectors[9].

The mechanisms that make it possible to open and share data, and grant access to great volumes of sets of data are crucial, because AI predictive models are optimized as more data can be accessed, because patterns can thereby be detected with more certainty.

8 *According to The Rise of Social Media. Our World in Data. Available on ourworldindata.org/rise-of-social-media According to Consumer data right (CDR). Australian Competition & Consumer Commission. Australian Government, February 7th, 2020. Available on https://ww-w.acccgov- .au/focus-areas/consumer-data-right-cdr-0 able-development/index.htm*

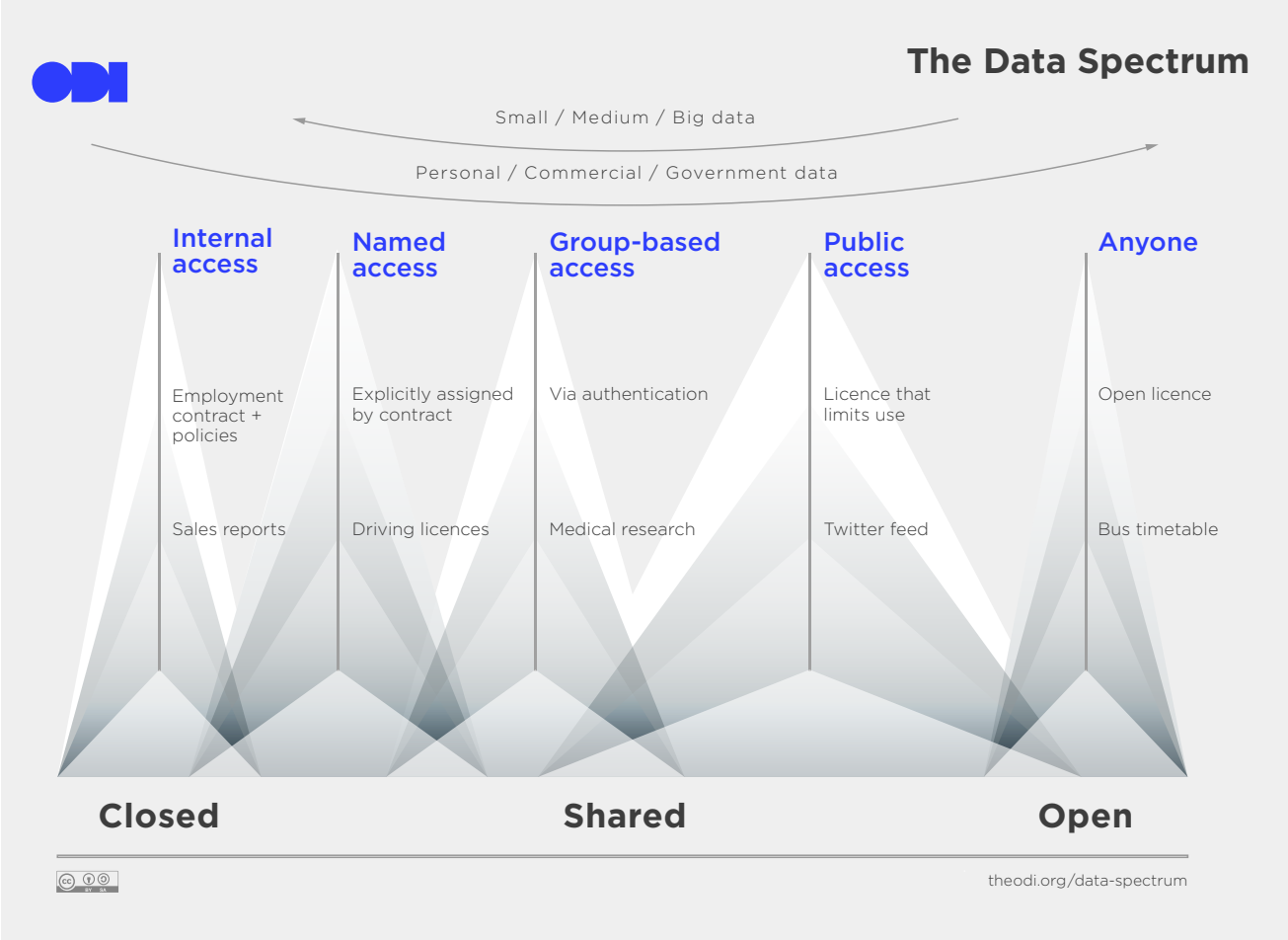
9 *According to The Rise of Social Media. Our World in Data. Available on ourworldindata.org/rise-of-social-media. According to Consumer data right (CDR). Australian Competition & Consumer Commission. Australian Government, February 7th, 2020. Available on https://ww-w.acccgov.au/focus-areas/consumer-data-right-cdr-0*

Data as a New Asset

Classification

Even though the term "open data" is relatively common knowledge, data classification includes more categories according to their license (or access). The use of accurate language for each of them bears testament to the multiple challenges and opportunities they involve. The Open Data Institute (ODI)[10] suggests placing data through a spectrum that presents the types of data in a graph that goes from close to open data, clarifying the name of the type of data that applies to each group and giving concrete examples, as shown in the image below.

Image 1 - Data Spectrum



Source: Open Data Institute[11]

10 The Open Data Institute (ODI) is a non-profit organization based in London, United Kingdom. Its mission is to collaborate with governments and other organizations to build an open-data, reliable ecosystem. https://theodi.org/

11 The Data Spectrum. The ODI. Available on theodi.org/about-the-odi/the-data-spectrum/

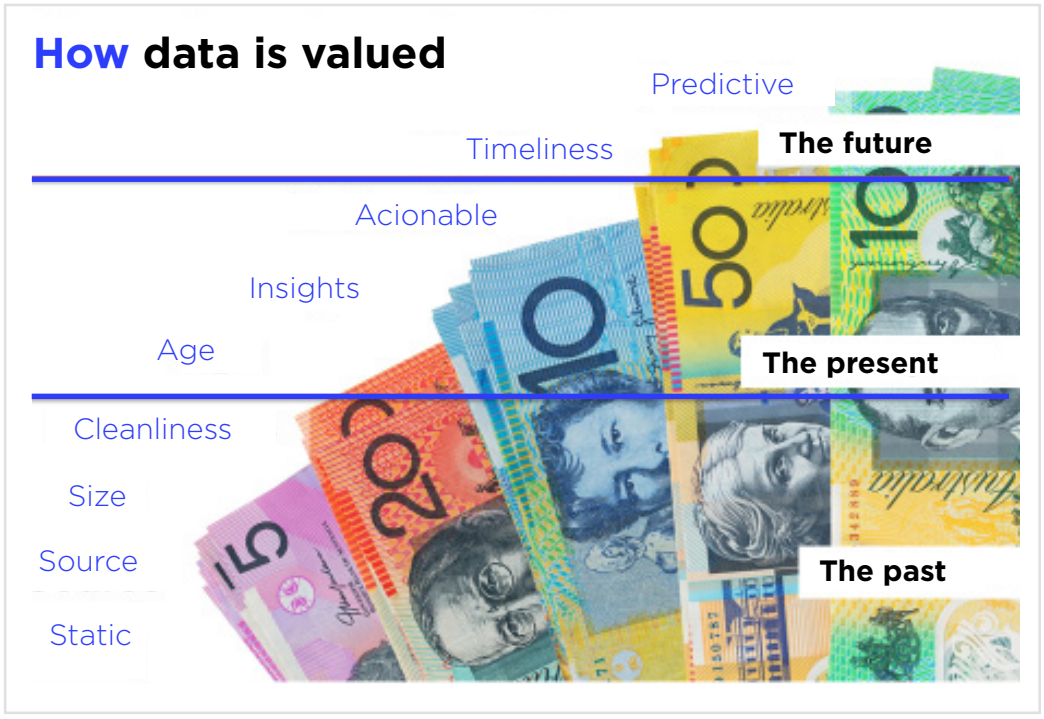
Economic Value

In today's world, increasingly more digitalized and connected, data are produced in outstanding amounts. They are combined and analyzed by technologies such as AI to generate even greater economic and social value. In all, it is estimated that about 289,351 gigabytes of data are generated every second globally[12], lwhich is the equivalent of over 206,000 films[13], contributing approximately US$1.7 Bn. per year to G7 countries. It is estimated that by the en d of 2020 there will be 40 times more bits than stars in the visible universe[14]. Likewise, it is estimated that the value of G7 data would be the tenth biggest economy in the world, ahead of Canada, South Korea and Russia (Digital Realty, 2018).

Throughout the years, different methodologies have been studied and implemented to estimate the economic value of data, a complex task that involves objective issues, related to the type of data and their impact on economy, and subjective ones, determined by the value each individual attaches to their personal data.

One way to gauge the value of a set of data is according to their direct usability and their usefulness. Direct usability refers to the cleanliness and size of the set, to mention some examples, whereas usefulness is associated with data relevance, for example, if they are updated. Image 2 illustrates this data categorization.

Image 2. Data Categorization



Source: Kylie Davis. The 9 Things That Make Big Data Valuable, on CoreLogic[15].

12 *According to Data Economy: Radical Transformation or Dystopia? Frontier Technology Quarterly, United Nations. Available on www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/FTQ_1_Jan_2019.pdf*

13 *Taking as reference 0.7 GB per hour, with medium resolution and an average of two hours per film.*

14 *How Much Data Is Generated Each Day? World Economic Forum. Available on www.weforum.org/agenda/2019/04/howmuch-data-is-generated-each-day-cf4bddf29f/*

15 *Available on: www.corelogic.com.au/resources/9-things-make-big-data-valuable*

Monetization

A phenomenon that should be taken into account in data economy is monetization. One of the main internet businesses, especially for big technology companies, has been data exchange through digital services[16]. Many companies that provide email services, social networks, digital platforms to sell and buy products by individuals and different mobile applications offer services in exchange for users' personal information. These data are typically used to improve the service and to be sold to third parties. These companies are called "infomediaries"[17].

Some companies go beyond offering digital services in exchange for personal data, trading them for physical products, as is the case of the Shiru Café from Japan, presented below.

Use Case: Coffee for Personal Data (Japan)

The Japanese coffee shops chain Shiru Café uses a business model in which it offers beverages in exchange for certain personal data (shared voluntarily by the user through a file) belonging to students and teachers (Bhattacharyya, 2018). The business model of Shiru Café implies selling these data to companies that are potentially interested in hiring those students.

The company is clear about who will have access to those data and offers a financial compensation to the owners of those data in the form of beverages, access to an electrical outlet, a space to study and the opportunity to meet the sponsors of the coffee shop in meetings organized by store.

The company's clarity regarding its business model seems to be part of the reasons for its success. In 2018, Shiru Café already had over 20 stores in the most prestigious universities of Japan and India (Frankel, 2018).

16 This type of service is usually received in exchange for users' personal data and, therefore, is not necessarily free

17 Data as a service (DaaS) is defined as an "information provision and distribution model, in which data files (including texts, images, sounds and videos) are made available for customers through a network, usually internet". Available on: https://searchdatacentertechtarget.com/es/foto-articulo/2240224777/10-definiciones-de-modelos-de-servicios-en-la-nube que-debe-conocer/3/Datos-como-servicio-DaaS

However, the collection and use of personal data is not always completely transparent. There is an important debate about data monetization in terms of personal data ownership and privacy because there are cases in which users' personal data are provided without their consent and even without clarity about the value of data or how they will be used. Considering that people contribute with an asset in the form of data to generate economic and public value, there is questioning about whether people should become shareholders with the right to receive some kind of retribution for the income earned by companies. In the cases of exchange of digital assets and goods or services, for example, the question arises to know whether the retribution people receive for sharing their personal data and the data shared have the same value. The ownership of the value of data and the wealth distribution in data economy are only in the definition process, but they have become a priority all over the world.

In this sense, The Financial Times has developed a virtual calculator (Steel, et al., 2013) that uses a questionnaire with questions about health, consumption patterns, recreational activities and other social and demographic data so a person can have an idea of how much a company would pay for their personal data. The study conducted by this newspaper shows that, depending on the different users' characteristics, a person's data can be worth more than those of another person.

Likewise, it is interesting to highlight the great difference between the real value of data and its perceived value. A survey carried out in the United Kingdom has determined that, on average, it is estimated that people would sell their data for £2,031, when some companies pay only £45 for some data, less that 5% of their sensed value. Specifically, the people interviewed put an average price of £983 for their email address, a piece of information that is actually estimated to be worth five pounds. It is important to mention that, according to this survey, young people between 18 and 24 years old are the ones who give more value to their personal data[18], illustrating a change of attitude in young generations regarding the value of data and their ownership.

18 *In What Is Your Personal Data Worth? Available on TotallyMoneycom, www. to tallymoneycom/ personal-data/infograp hic/*

3. Artificial Intelligence as a New Instrument of the Economy

Even though the term "artificial intelligence" is usually associated with science fiction, it is actually much broader and more multifaceted than it is believed in the public imagination. It was used for the first time at the Dartmouth Conference in 1956 by John McCarthy[19] who defined it as the "science and ingenuity of making intelligent machines, especially intelligent computing programs" (Guillén Torres, 2016). Likewise, Brad Smith (2019), president of Microsoft, defines AI in his book Tools and Weapons as "a computational system that can learn from experience, discriminating between patterns within data, and it feeds back from those patterns to be able to recommend actions". Even though there is no consensus on the definition of what AI is, in general it refers to the capacity of a digital system to fulfill cognitive functions such as learning, interacting, creating and replicating, all of which were attributed only to humans.

For the time being, the existing AI is known as soft AI, capable of carrying out a specific task performing better than a human being, as opposed to hard AI, which would be capable of reasoning as a human being in every aspect. As it has a limited reach, AI actually refers to a set of different techniques that produce an intended result. The hard AI has not been developed yet, and experts disagree on the possibility of developing it.

AI has different types of learning, and this report focuses particularly on those that require sets of data (unlike systems that learn from experience). The different types of learning can be seen in chart 1.

19 *AI expert, Turing Award 1971.*

CeTyS Universidad de San Andrés
In collaboration with: fAIr LAC | BID Banco Interamericano de Desarrollo

Chart 1 – Different types of learning.

Type of learning	Input for learning
Supervised	It uses big, labeled databases with historical data.
Reinforcement learning	It learns by itself interacting with the environment.
Unsupervised learning	Hybrid (Data mining and experience-based learning).

Chart 2 highlights some examples of the technologies or fields of application of AI, together with examples of everyday usage.

Chart 2 - Examples of the technologies or fields of application of AI, together with examples of everyday usage.

Technology	Everyday example
Machine learning	Transport and mobility apps such as Uber.
Processing of natural language	Virtual assistants such as Siri and Alexa.
Computational vision	Facial recognition.
Robotics	Arms in industrial factories.
Knowledge representation	Representing information of the world in a way that can be digested by machine learning models.

Source: C Minds, with the support of Ricardo Reyes, expert in AI and Erudit.AI partner.

AI Uses

The implementation of AI has optimized data analysis, providing inputs that make processes more efficient and enable an evidence-based decision-making.

Chart 3 summarizes several AI applications for the efficient use of resources and for the generation of value in all the sectors, from industry to government.

Chart 3 – AI applications.

Resource saving	Value generation
Enhancement of labor productivity by increasing automation, improving visibility and enabling the early detection of anomalies.	**Data monetization** by selling data of the organization or adopting a pay-per-use or data-as-service model.
Efficiency of the value chain by eliminating unnecessary work steps and optimizing routes/processes.	**Improvement of products and services** by analyzing data coming from purchases.
Security improvement by processing data of materials, personnel and location.	**Identification of new applications** for existing products and services.
Reduction of defects in manufacturing by analyzing failure risks and understanding failure patterns.	**Increase of product margins and launch of new products** by analyzing data from consumers and their purchases.
Optimization growth by limiting the use of resources, lowering maintenance costs and extending the lifespan of assets.	**Improvement of consumer experience, indirect advertising and marketing** by analyzing data.

Source: Opher et al., 2016

The term business intelligence represents a technology process to analyze data and present operable information that helps key players make better-informed decisions. Having ever more sophisticated tools to analyze data has become a strategic element in operations and business models of companies and governments. They can achieve greater costs

efficiency and improve their operations, as well as innovate in the offer of products and services to satisfy the needs and the demand of customers or citizens through AI-based tools. In fact, in 2018 it was estimated that approximately 70% of companies might have adopted at least one type of AI technology (Bughin et al.) by 2030. The following text box tells about the implementation of AI in a case in the agriculture business.

Use Case: AI for Agriculture

In 2018, programmers from Brazil and the United States noticed that, more often than not, small and mid-sized farmers do not have records of their financial statements and accounts data that can grant them access to loans from commercial banks. Moreover, given the perception of this sector as "high risk", interest rates are high. This hinders growth for this sector, because the investment offer is scarce and government subsidies are insufficient.

In light of this need, Brazilian entrepreneurs founded Traive, a startup that designed an application for mobile devices that provides a given rating through a risk estimation for agricultural credits. The calculation uses models that predict default risks and delays in payments, but anyway explain the factors driving such risk (for example, agronomic risk, the weather, market volatility, behaviors, etc.), so farmers have an opportunity to get a better rating.

This application not only helps obtain an unbiased assessment of farmers, but it also allows more and better investment opportunities.

From the government perspective, data analysis through AI makes processes more efficient and reduces administrative costs, and it also provides inputs to offer better and more personalized public services, among other benefits. On the other hand, it enables the interaction between citizens and governments by creating new, more efficient channels of communication, such as chatbots or virtual assistants. An analysis made in 2018 by the multinational Deloitte (2017) estimated that a minimum level of investment in AI might free 2% - 4% of the time of government personnel in the next five to seven years, while an optimum level of investment might free up to 30% of the total work time of public servants.

By the time this report was published, 10% of Latin American countries had developed an AI strategy, according to an internal source at C Minds, which shows a growing interest by governments in leveraging the benefits of AI from a public policy perspective. In line with the achievement of the Sustainable Development Goals (SDG) of the United Nations (UN), the implementation of AI in government is a new tool that is vital to face the most important regional challenges, as shown in the following case.

Use Case: AI to File Gender-based Violence Complaints (Argentina)

In 2017, the government of Buenos Aires identified an area of legal opportunity in the process of gender-based violence complaints. In the face of this issue, a system called Prometea was created, which makes it possible to automate processes and criminal complaints related to this matter. Prometea expedites and completes processes to fill in forms and questionings, and it suggests one out of four necessary and specific decisions through a chat or voice command.

Likewise, the system integrates a tool to create documents annexed to the decision, such as official letters to different agencies, based on the statement of facts. With Prometea, the decision and related official letters (nine documents in all) are prepared in two minutes.

The power of data, boosted by AI, might be such as to lead some experts to think that they should be considered a public asset (Taylor, 2016), ensuring its access and use to institutions that seek to create a positive social and/or environmental impact. However, even though AI entails great opportunities for topics related to productivity and social development, it is important to emphasize the risks involved by its development and implementation.

4. AI Risks

Contrary to what Hollywood science fiction films portray, the consequences of using AI are not as easy to understand and predict. In fact, 45% of global business leaders state that they do not understand the unforeseen consequences of AI enough20[20]. What we can claim is that AI, as it is a disruptive and general purpose technology, is a tool with major change power, which entails the need to adopt a responsible use approach, and to take the necessary precautions to prevent unexpected and harmful consequences.

The responsible use of AI goes beyond avoiding illegal practices through its use. It is about using AI in a way that does not undermine minorities, that avoids the violation of human rights and does not lead to increasing the existing inequality gap, whether intentionally or accidentally.

Among the consequences of using AI, there are intrinsic risks directly associated with data, and extrinsic ones, related to the adoption of AI by the society. Against conventional wisdom, these risks are not an unavoidable collateral effect; rather, they can be minimized through enough planning, control and governance[21]. That is why leading players in the subject, such as the Organization for Economic Cooperation and Development (OECD), the Inter-American Development Bank (IDB) and other institutions talk about the responsible use of AI. This refers to a framework of AI development whose objective is to ensure the ethical and transparent use of users' data adopting mechanisms that make it possible to meet their accountability expectations, always considering the values of the organization and the rules of society.

20 20As can be seen in: AI Momentum, Maturity & Models for Success, Accenture. Available on www.accenture.com/t20180919T202227Z _w_/us-en/_acnmedia/PDF-86/Accenture-AI-Momentum-Final.pdf

21 As can be seen in RESPONSIBLE AI: A Framework for Building Trust in Your AI Solutions, Accenture. Available on www.accenture.com/_acnmedia/pdf-92/accenture-afs-responsible-ai.pdf definiciones-de-modelos-de-servicios-en-la-nube-que-debe-con- ocer/3/Datos-como-servicio-DaaS

Intrinsic Risks

s was mentioned in previous paragraphs, AI has the potential to maximize the efficiency of processes in different environments. However, it is necessary to acknowledge the fact that the use of AI poses multiple intrinsic risks; that is to say, they depend exclusively on the use of data.

There are at least four types of risks that we need to consider in the planning, programming and implementation stages for a responsible use of AI. This report underscores the following: (1) Justice and inclusiveness, (2) system reliability and security, (3) privacy and security of users' data, and (4) transparency and accountability.

Justice and Inclusiveness

In spite of the common assumption that an algorithm might be biased, in fact an algorithm is only a code that follows procedures and cycles that process data in a program. What can be biased is the result, not because of the algorithm itself but because of the human involvement in its construction and training.

On the one hand, the bias may be found in the sets of data used for AI training. Algorithms are trained based on data records to build a predictive model, adopting the machine learning processes that will be used later. Even though models are usually presented as mechanisms based on objectivity, they can actually be opinions embedded in mathematics, according to Cathy O'Neil[22]; training data may include human biases or reflect social and historical inequalities. In turn, an overrepresentation or underrepresentation of certain groups in the training data, as well as a data sample that does not correspond to the data the algorithm will face in reality will affect the results in favor of or against certain groups (Manyika et al., 2019).

22 Cathy O'Neil is an American mathematician, a Harvard graduate and founder of ORCAA, a consulting firm that helps companies and organizations manage and audit algorithms-related risks.

On the other hand, biases can be rooted in the programming of algorithms, as a consequence of how data are selected through a chain of algorithms or how they are trained. Biases in the construction of algorithms can be attributed to the labor monopoly of white men in programming jobs (Manyika et al., 2019). As this group lacks in diversity, programming does not take into account the way the set of training data or the programming of algorithms may affect other groups of the population, which will be later reflected in the results produced by programs.

AI results simply reproduce the prejudices of human beings, determined by cultural, political and social contexts. The risk is that the results of the algorithm have a massive reach and they amplify exponentially the prejudices they reproduce. They can be not only unfair and discriminatory, for example using a recruiting algorithm that favors male applicants, (Wen, 2019), but also even harmful, when they are used to predict criminals' recidivism (Angwin, 2016). The most interesting aspect to highlight about many cases of algorithmic bias is the time it has taken implementers to identify the prejudice spread.

Even though AI models are not bias-free, there are already solutions in place to reduce its potential impact, among them ensuring the presence of humans in monitoring and supervision processes, and making sure that AI can be used as input for human decision-making, rather than as a decision-maker itself.

Use Case: Gender Discrimination in Recruiting Processes[23]

Since 2014, the e-commerce company Amazon has sought to develop a program to automate its recruiting processes. In one of the multiple pilot tests conducted, its specialists in Machine Learning generated an algorithm that used AI to review applicants' profiles; it evaluated the profiles and recommended finalists for the interview stage to recruiters.

The problem was related to the sets of data used for algorithm training: Profiles of previous and current employees. As a high percentage of them were men, who are ubiquitous in the technology sector, the algorithm not only favored that variable, but it also used gender as a selection criterion, discarding the applications that included the term "woman" or that implied that the applicant was a female.

Even though programmers set parameters so the algorithm was neutral for the "male" and "female" terms, the program was later abandoned given the small chance of success without discrimination.

23 *Note from the editor: This example is also the one developed in the document of this collection, Carlos Amunátegui Perelló and Raúl Madrid, Sesgo e Inferencia en Redes Neuro-nales ante el Derecho.*

System Reliability and Security

A reliable AI system should be capable of preventing "involuntary" errors. It is made up by technical robustness, human action and supervision, and digital security. Technical robustness should be internal and external. The internal one starts in the planning phase and it requires the permanent design and update of programs bearing in mind the technical risks the software might face, and reducing to a minimum the error margin of the expected results; the external robustness should take into account the environment and the context in which the system operates to prevent hardware failures.

When it comes to error margin and technical risk, it is important for the model to work under human supervision, ensuring ethical results aligned with the initial goal and the parameters set.

Finally, digital security requires that AI, as any other digital technology, have software protection to prevent malicious external or internal agents from compromising the system. It is necessary to prevent cyber-attacks that allow malicious agents to manipulate or take control of the system, especially when lives depend on those systems, as in the health sector. The next use case illustrates the risks faced by organizations when they do not take care or anticipate risks in the security of their system.

Use Case: Hospitals Paralyzed by a Cyber-attack

In 2017, one of the most serious international cyber-attacks in the world took place. In the USA, Spain, Portugal, Russia and 60 other countries there were blockings and threats of theft, elimination and leaking of data in public institutions and companies.

This massive hacking took advantage of the lack of software update in the computing systems of some hospitals in the United Kingdom, among the St. Bartholomew Hospital, to take institutions data hostage. During the attack to the hospital, some rooms were blocked, telephone systems were shut off and databases could not be accessed. The infected computers encrypted the information and demanded payments in crypto-currency to release the software and data. The consequence of the cyber-attack was that the lives of patients were at risk: People receiving chemotherapy had no treatment while the attack lasted and others could not undergo surgery, to name a few repercussions.

The cyber-attack came to an end thanks to the combined efforts of international intelligence agencies to counter its harmful effects and it showed how important it is to strengthen the security of the systems in institutions that safeguard important and sensitive data.

Privacy and Security of Users' Data

When we talk about users' security, we refer to privacy of their personal data. Indeed, a great amount of inputs driving data economy come from consumers, so they demand increasingly more protection and privacy. Such protection should cover the areas of consent, data abuse and discrimination.

As they have lax security systems, companies and governments expose their customers and citizens to the risks of a wide surveillance network where each digital action is traced and monitored. This may lead to profiling and to the prediction and manipulation of behaviors with a high risk of incurring in the violation of human rights (see the next case of exposed use)[24]. These concerns are exponentially amplified if we talk about biometric data. Knowing that their use is increasingly more common, it is important for institutions to adhere to standards in digital security that are permanently updated.

In other cases, the challenge is related to consumers' consent to share their data and the possibility to understand their intended used (sale to third parties, for example). The terms and conditions customers are asked to read are unintelligible and they usually end up in a click on "accept terms and conditions" without really understanding the implications for privacy (Litman-Navarro, 2019). Even though there is a responsibility as consumers to read that information, it should also be considered that companies have a responsibility to make it understandable for the general public, as acknowledged by the European Union in its latest regulation regarding data privacy.

Use Case – Discouraging Voting through AI

In 2010, the political party Congreso Nacional Unido of Trinidad and Tobago, in the coalition People's Partnership (PP), which had never obtained a majority of votes thus far, hired the service of the digital political marketing group Strategic Communication Laboratories, known as Cambridge Analytica. According to El Diario and other sources, this group allegedly gathered data about thousands of voters on the island and, after analyzing the data of the citizens, would have decided that, as there was a slight difference between the two parties fighting the election for Prime Minister, the best idea was to target the undecided population, mostly young people. >>

24 *Developed in Rethinking Privacy For The AI Era. Forbes Insights, www.forbes.com/sites/insights-intelai/2019/03/27/rethinking-privacy-for-the-ai-era/#771401f97f0a.*

>>

Taking this information into account, the media informed that the company had created a campaign called "Do So" urging young people on the island to protest through political abstinence, which included discouraging voting as a means to protest. It is explained that the campaign was aimed directly at the target group using social networks data to identify them so as to send specific messages to their platforms and digital networks (advertisement, videos, blog entries, etc.) encouraging them not to vote. They started a chain of action of such magnitude that even young people who did not receive any money from the company joined their promotional ranks, creating content (pages, videos and balls) to support this campaign.

Even though the direct relationship between the facts cannot be verified, the absence rate in the election was 6%; this changed the course of the election, leading to the triumph of the Congreso Nacional Unido party in the PP coalition.

This case led to discussions regarding the role of that campaign, based on data collected and used without the consent or the knowledge of their owners, in the success of the party. It is worth mentioning that Cambridge Analytica is the same company that was hired by the current president of the United States, Donald Trump, for his election campaign, and by the successful Brexit campaign in the United Kingdom.

Situations like the one exhibited have taken place in different contexts and in different regions of the world, alarming consumers, the society and controllers. Therefore, it is important to create guidelines and regulations that prevent the misappropriation of data for certain ends that are not aligned with democracy or human rights.

This conversation usually includes the debate about the possible success of self-regulation by part of the industry. Nevertheless, the growth in numbers and scope of data breaches indicate that this action is not enough. According to a study quoted by Forbes, there is a lack of economic incentives for companies to take more robust security measures. The average cost of a data breach, estimated to be US$3.86 million globally, is marginal compared to the annual income of big companies, ranging between US$100 million and US$25 billion. Even though other variables may be considered, such as confidence and stock exchange price, they seem to have few significant repercussions in the long term, as shown by the most controversial data breaches these days[25].

25 *It can be checked in Rethinking Privacy For The AI Era, Forbes. Available on ww-w.-forbes.com/sites/in-sights-inte-lai/2019/03/27/rethink-ing-privacy-for-the-ai-era/#18fb79057f0a.*

Transparency and Accountability

Transparency refers to the capacity to explain the decisions made based on the information of an AI system. However, some kinds of AI techniques, such as neural networks, have such complex internal processes that they are unlikely to meet explainability criteria. In other occasions, even if it were possible to explain the process and share its operation, it would imply disclosing property codes or secrets of the industry, affecting companies' competitiveness. Sometimes the decision-making process simply cannot be traced. Besides understanding the code, it is believed that consumers should have the right to understand what variables taken by the algorithm influenced the decision and how that could be reverted.

Many companies are developing solutions and creating tools that can explain the conclusions of their algorithmic models. The challenge is that there is no consensus about the definition of a fair explanation, about the ideal level of transparency, or about how clear the explanation should be. As Data & Society, an organization that raises awareness about new technology applications and social impact, says, we need to ask ourselves, "transparent for whom, and to what end?" (Matsakis, 2019).

Another question being raised among players of the AI ecosystem and consumers has to do with accountability: "who should be accountable for a potential damage caused by an algorithm?" This issue is known as "accountability breach", and it refers to the fact that legal systems are based on a fundamental assumption of human actors (Bartlett, 2019). Replacing them by autonomous actors creates chaos regarding causality, justice and compensation, because, in order to implement the different legal systems, it is necessary for a person or group of people to be held accountable[26].

Taking into consideration the challenges entailed by marking a group of people as accountable for the damages caused by AI models and by creating the mechanisms for the public to hold somebody accountable, new solutions are being explored. Among them is the example of the United Kingdom, which is entertaining the possibility of implementing No-fault hedging policies according to which the victims lose their possibility to file a lawsuit, but they are recognized the damage suffered and the government bears the costs incurred by the damage (Bartlett, 2019).

26 *As explained in Managing The Ethics Of Algorithms, Forbes, 27th March 2019. Available on forbes.com/sites/insights-intelai/2019/03/27/managing-the-ethics-of-algorithms/#7639f39c3481.*

Extrinsic Risks

Apart from the intrinsic AI risks, there are social risks related to its general adoption. One of the concerns fueled by the narrative of the media has to do with the future of work. Many news articles and stories portray a world in which workers have been replaced by intelligent robots, freeing humans from exploitation but rendering them irrelevant. Authors like the historian Yuval Noah Harari (2016) believe that "it is worse to be irrelevant than to be exploited" (496).

AI, understood as automation, will modify the way a great number of jobs are done, as certain tasks are complemented by automated systems, freeing the time of the labor force for tasks that require essentially human capacities. The OECD estimates that 14% of jobs will be affected globally, while 32% of jobs will be affected significantly. Regarding Latin America, the IDB (2018) estimates that between 36% and 43% of jobs may feel the impact of AI.

Even though the AI revolution promises to change the way we work, adding robots and intelligent systems to the labor force in an accelerated manner, this idea of a future without jobs is distorted. First of all, it is important to understand that most jobs will not disappear, but their processes will be modified as systems driven by AI will be in charge of performing the most repetitive tasks. Secondly, we should remember that employment has remained relatively steady throughout history in spite of the growing role of automation. The reason behind this is that, historically, new jobs and tasks that can only be done by human beings have always been created (Azuara Herrera et al., 2019). In fact, the OECD highlights that the labor transition of the 4IR will probably create as many new jobs as it will eliminate, and the World Economic Forum predicts that 65% of the children who are currently studying at elementary school will have jobs that do not exist right now (Martínez et al., 2019).

It is imperative to prepare the present and future labor force for the accelerated change resulting from the AI capacities and its increasingly generalized adoption.

In collaboration with:
fAIr LAC | BID

It is necessary to adapt the knowledge and skills of current workers to new market demands. This entails designing new programs, contents and forms of learning that allow children and young people to develop soft skills in terms of communication, creativity, team work, critical thinking and around continuous learning. Inasmuch as the world keeps changing, retraining programs will make it possible for adults to keep acquiring relevant competencies throughout their lives, reinforcing their professional training. As the IDB (2018) points out all too well, "governments will have to look for new ways to promote and, in some cases, fund or co-fund these changes, in such a way that they are inclusive for all the people".

5. Best International Practices

In a context of digital economy, a new methodology has been proposed to determine the size of the economy considering the value of data: the Gross Data Product (Chakravorti, 2019). The study takes into account four criteria for the 30 countries assessed: Volume, use, accessibility and complexity of people's digital activity. The study includes 30 countries and classifies the four Latin American countries that participate in the following way: México ranks 18/30, Argentina ranks 19/30, Chile ranks 20/30 and Brazil ranks 22/30, showing that there are still areas for opportunity in the region in terms of data economy[27].

Latin America has reached a turning point because it is on the verge of becoming one of the regions that has grown the most in the world. Even though its current digital economy can be compared to China's, the penetration rate of technology has been growing expeditiously for the last 10-15 years (Hass, 1019). The GDP of the region might grow by 5.4% as a result of the impact of AI as soon as 2030[28].

In order to keep moving forward in the direction of competitiveness and growth, it will be important for the region to consolidate the basis for a responsible adoption of AI, an approach that should ensure inclusive participation processes by all the sectors. Besides detailing what it means to lay the foundations for collaboration and participation, this report seeks to share examples of best cross-cutting practices that may be carried out in parallel to boost its impact.

In the next section, there are six examples of practices that cover at least two of the challenges aforementioned, seeking to reconcile ethical risks with economic competitiveness topics. These initiatives have already been implemented or else have just begun to explore how to promote a successful transition to 4IR, protecting privacy, security and human rights.

27 The United States ranks 1/30 and Indonesia ranks 30/30.

28 28According to Sizing the Prize What's the Real Value of AI for Your Business and How Can You Capitalise?, PwC. Available on www.pwc.com/gx-/en/issues/analytics/assets/pwc-ai-analysis-sizing-the-prize-report.pdf.

Fundamentals and Regulations for a Responsible AI

The everyday presence of AI in people's lives has brought about a wave of creation of guides, principles and frameworks for the responsible and ethical use of AI. These documents have been drafted and promoted by governments and intergovernmental organizations, companies, professional associations, activists and initiatives among multiple players of the ecosystem.

The OECD proposal (2019) is one of the most recognized sets of principles, and it aims at strengthening people's trust through the responsible use of AI. In early February 2020, only 35% of Latin American countries had signed these principles, according to an internal source of C Minds.

Some organizations, as they try to outline the main topic trends, have focused on identifying consensus and similarities among the most prominent 36 documents dealing wih AI principles. Eight key topics stand out, which are presented below according to their recurrence in the different documents, starting by the ones mentioned in each of the documents analyzed:

1. Justice and non-discrimination: AI systems should be designed to maximize justice and to promote inclusiveness (mentioned in 100% of the documents).
2. Privacy: AI systems should respect individuals' privacy regarding the use of data and offer people more control over their data as well as information about the decisions made with them (97%).
3. Accountability: There should be mechanisms that allow an appropriate allocation of accountability and ensure compensations for the people or entities damaged (97%).
4. Transparency and explainability: The development and the implementation of AI systems should have mechanisms that allow a continuous and appropriate supervision (94%).
5. Security: AI systems should be safe, work in the intended manner and be resistant to hacking attempts (81%).
6. Professional responsibility: The people involved in the development and implementation of AI systems should meet the highest standards of professionalism and integrity to ensure the success of the system (71%).

7. Human control over technology: The important decisions should be supervised, reviewed and made by humans (69%).

8. Promotion of human values: The purposes of the use of AI systems and the way they are implemented should correspond to basic values and promote the well-being of mankind (69%).

The most recent documents usually encompass each of these eight points, which suggests a convergence in the conversation about AI principles and, thus, points to the emergence of a regulatory basis in terms of principles for AI ethics and governance.

Even though this represents great progress in the conversations regarding the handling and future of AI, it is necessary to remember that the principles are only a first step in the acknowledgement of the importance of ethics. As Carina Prunkl, the expert in AI ethics from Oxford University, in the United Kingdom, has stated[29], these principles are more focused on the challenges of AI than on offering solutions for them. Indeed, for principles to be truly effective, they should be accompanied by relevant policies, such as national AI plans, legislation and regulations, and they should be reflected in professional practices and daily routines (Fjeld, 2020).

The possibility to create certifications for the responsible use of AI is also under review, a conversation that is being held in different organizations, such as the Institute of Electrical and Electronics Engineers (IEEE)[30], C Minds, the IDB, the OECD and the Dutch government.

Regulation for Data Protection of the European Union

30 It is the world association of engineers that deals with the normalization and the development of technical areas. It has approximately 425,000 members and volunteers in 160 countries, and it is the biggest non-profit international association made up by professionals of the new technologies[31] (RGPD). This instrument came into force in May 2018. Its main objective is to protect citizens from breaches to their privacy and from the use of their data, and to offer them greater control over what is gathered and shared about them. The regulation compels companies to enhance the transparency mechanisms regarding

29 During her visit to Mexico in February 2020, in the event 'Un Acercamiento a la Inteligencia Artificial" of the Science and Technology Commission of the Senate.

30 It is the world association of engineers that deals with the normalization and the development of technical areas. It has approximately 425,000 members and volunteers in 160 countries, and it is the biggest non-profit international association made up by professionals of the new technologies

31 EU - RGPD: https://euRGPD.org/

the use of people's data. It requires that companies get users' consent to gather and use their data (for a given purpose) and it issues a regime for new fines.

In order to comply with the requirements established, companies are asked to monitor people on a big scale regularly and systematically, and those companies that process great amounts of sensitive personal data should hire a person responsible for data protection, prioritizing the subject of data protection during board of directors meetings.

Moreover, it lifts the legal barriers to prevent companies from publishing ads based on personal matters, such as work, education or marital status. This regulation is expected to reduce the administrative burden for EU companies by up to €2.3 Bn. (approximately US$2.5 Bn.) per year, thanks to the creation of a single authority for all the administrative decisions related to data processing.

As for individuals, the regulation gives them the right to ask a company to give them or, under certain conditions, to delete all the data this company has about them, and it exempts individuals from having to abide by a decision if it was made automatically and it has a considerable impact on them personally (Burgess, 2019).

The convergence between the GDPR and AI is accompanied by interesting discussions. In the conversations, the Article 22 is underscored, which affects automated decision-making and profiling. At the same time, the topic most actively discussed refers to restrictions to make a fully automated decision that has legal effects or affects one person significantly. In order to be applicable, significant information about the rationale involved in the decision-making process has to be shared, among other aspects. This differs from the algorithmic explainability, in which the "how" and "why" of an individual automated decision should be explained. Rather, information about the algorithmic method used is required, which is very different from explaining the rationale of an automated decision-making. In this sense, no code information that might be proprietary is asked to be shared, a misunderstanding that has disappointed the industry.

According to experts, adopting the GDPR in an AI context might be a key driving force in terms of trust, acceptance and adoption by consumers and governments, as well as an important first step towards a regulated data market (Spyridaki, 2019). However, it has been accepted that the regulation, in its current version, has areas of opportunity, such as the existence of gray areas due to an ambiguous use of language that could lead to misinterpretations with serious repercussions (GDPR editors, 2019).

Data Trusts

Data Trusts are defined by the Open Data Institute (ODI), one of the leading organizations in this matter, as a legal instrument that provides an independent data administration. They would allow deciding who can have access to certain data, to what effect and who would benefit from that. It is suggested that several organizations that gather and store data authorize an independent institution agreed upon to make decisions regarding the use of those data and how they are shared for a previously arranged purpose. Trusts would take responsibility over the way data are used and shared, and they would assume some obligations. They would be responsible for ensuring that the decisions made contribute to the purpose of the data trust, as well as to the benefit intended, balancing opposing views.

Even though they are called "trusts", the ODI states that they do not necessarily have to be controlled through the legislation and regulations related to trusts (Trust Law), as these laws regulate the propriety of goods, and that is not the case for data. However, they are used as reference to aim at the establishment of obligations that are similar to those of trusts.

Trusts could have different forms according to the context and the processes to be monitored and protected. Some examples the ODI determines are: Terms and mechanisms of operation, an organization, a legal structure, a data storage instrument or a public surveillance mechanism.

In order to understand how a trust works, we should be clear about the participating players and the benefits they obtain:

- Data holders, that is to say, not their owners but those who collect and store them in the private, public and third sectors, might enable access to their data, reducing the necessary resources.
- Groups working with data holders might help them examine, design and operate a data trust or advise independently to assess their reliability.
- Citizens and consumers might advocate for data trusts to achieve processes that are more open, participative and deliberative regarding the way their data or data whose use affects them are shared and used.

- Data users might participate in data trusts to ask for authorized access to data stored by organizations.
- Governments might mandate a data trust to prevent data monopolies or restrictions to access data of certain organizations. Likewise, they might promote the creation of personal data trusts by funding them and sharing research on the subject.

One of the main reasons to set up a data trust is the possibility of unlocking the value of data, enabling collaboration in common challenges, offering new opportunities to startups and businesses to innovate with data. In a nutshell, a data trust might ensure that the benefits of data are distributed in a broader, fairer and more ethical way (ODI, 2019). In particular, when it comes to AI, the trust model would make it possible to boost and democratize the use of such technology as a result of greater data availability.

Data Trusts are in an incipient stage, but they are expected to work as governance agreements among the parties to ensure faith in the data access and exchange process between third parties.

Data Portability

This concept is based on the belief that people should be able to transfer the data that a service has about them and take them to another service. It is argued that it can promote online competitiveness and foster the creation of new services. In spite of the inconveniences this entails, experts in the subject of competitiveness and data protection agree that portability may empower people by giving them more control over their data and simplifying the selection of online service providers. On the other hand, the benefits that data portability brings to people, startups and big companies are acknowledged, as well as the fact that, as they can share data, a greater number of companies may train AI systems, increasing competitiveness and competition in the sector (Egan, 2019).

Even though the term “data portability” is found in the existing legislation and regulations, it is still a concept under construction and it is hard to explain from the point of view of controllers. Experts suggest having clear rules about what type of data should be portable and who would be responsible for the protection of data in case they are transferred to third parties. There should be clarity about how the issue of data portability to data shared among different people or to data resulting from the analysis of a person’s data would be implemented.

Many initiatives regarding this issue are already being developed all around the world. On the one hand, we have The Data Transfer Project, a collaborative open-source software project of Facebook, Google, Microsoft, Twitter, Apple and others, designed to help participants develop interoperable systems for individuals to be able to transfer their data between online service provides efficiently (Egan, 2019).

On the other hand, the state of California, in the United States, is about to implement a data portability provision that authorizes every consumer to transfer and move their data as they see fit. The provision establishes that information should be in a usable format so its transfer is simple and efficient (New America, 2019). The governments of Singapore, Australia, India and Hong Kong, to name a few, are also exploring the possibility to implement legislation in favor of portability (Egan, 2019).

Preparation of the Labor Force for Digital Transformations

The future of work is a priority and controversial topic that stems, to a great extent, from the possible impact of automation on jobs, while other elements, such as globalization and demographics, are driving changes in the labor force.

It will be important to ensure that people who lose their jobs can receive continuous training (upskilling and reskilling) to increase their employability opportunities according to new market needs. Nevertheless, the question arises about who will have to provide that training. While the previous industrial revolutions affected mainly manual tasks, a wider range of jobs will be affected by the 4IR: manual tasks, but also office and administrative tasks, and even highly-specialized professions.

The future of work is a global challenge, but changes in the labor force will take place in different ways and at different paces depending on the characteristics of the labor market in each place, creating the need to devise both national and local strategies to ensure an inclusive transition. It is vital for public policy makers to strengthen the adaptability of their labor markets, collaborating with other sectors to define a resilience strategy that encompasses the continuous training of the present labor market, the training in soft skills of the future labor market and the creation of adequate mechanisms of social protection.

IA Use Case: Free AI Courses in Finland

In 2018, engineers form the Helsinki University and the startup Reaktor launched the course Elements of AI, a free, online course about AI for Finnish citizens. Apart form being a technical course on AI, it is about helping people face the growing digitalization of society and understand the new possibilities that AI offers in the labor market, among other topics. It includes a great variety of modules, from the philosophical implications of AI to subjects such as Bayesian probabilities, and it ends with a certification upon passing an evaluation.

Considering the success of the program and the pressing need for AI not to be a topic addressed only by the elites, the Finnish government decided to promote the content among its citizens, setting the goal that 1% of the population should take the complete course. By February 2019, not only had the goal been exceeded, but the government of Sweden challenged the Finnish government to see which country would reach a higher number of citizens trained.

In 2019, the course was translated into several languages so it could be shared with the citizens of the other member states of the EU. It was shared as a Christmas present in December 2019 with the aim of training 1% of the EU population by 2021.

TechPlomacy

TechPlomacy is a concept developed by Casper Klynge, former Technology Ambassador of Denmark, and it refers to the need to face new challenges as a consequence of the disruptive technologies in a collaborative manner. The government cannot, and should not, be the only one to make decisions about this topic any longer, but the digital era demands a diplomacy that brings together governments, the civil society and technology companies. This conversation stems from the need to institutionalize answers to the growing impact of technology companies in the world. Besides having an influence on national and foreign policies of different states, these companies sometimes have their own foreign policies. It becomes important to apply external pressure so they bear a given level of responsibility for their actions and decisions (Brookings, 2018).
Specifically, there is a call upon efforts on both sides: Governments should

strengthen their collaborative capacity and culture, while external players such as companies should be more proactive in terms of sharing valuable information, limiting short-term benefit views.
Even though the concept of "TechPlomacy" is new, acknowledging the power of collaboration in the face of complex problems is not, and there are different initiatives in Latin America that seek to address the potential of new technologies as well as their challenges and opportunities from a multisectoral perspective.
Among them, Mexico's effort to create a national AI agenda collaboratively from the coalition IA2030Mx stands out. This multi-disciplinary civic group, starting off collective intelligence exercises, has been working since mid-2018 on a series of milestones to strengthen the ecosystem, co-create an outlook towards 2030[32] aligned with the SDG and take advantage of the benefits of 4IR[33].

AIn turn, there are emerging efforts on a Latin American and Caribbean level that seek to accelerate the ethical and responsible use of AI, such as fAIr LAC (Cabrol, 2020), a platform led by the IDB together with C Minds in collaboration with partners from all the sectors. This Project, launched in late 2019, has different hubs in the region in which governments work with the academic world to deal with the main local challenges. By way of example, the Jalisco hub, in Mexico, will be covering topics in the realm of education (school dropout) and health (diabetic retinopathy).

On the other hand, we have the Global Initiative on Ethics of Autonomous and Intelligent Systems of the IEEE, which includes the LatAm circle with the aim to contribute the perspective of Latin America to the creation of standards for AI algorithms, giving the region the opportunity to join the global conversations that will determine AI governance one way or another.

The set of best practices presented in previous paragraphs is only an overview on different complementary proposals and topics that seek to face creatively the challenges that accompany the development and implementation of AI from a global perspective. These examples try to bring Latin American decision-makers, both in companies and governments, closer to a spectrum of possibilities from which they can balance the pursuit of economic development together with the impact and social development in the region.

32 *www.ia2030.mx*

33 *They are six topics in all: Ethics; governance, government and public services; data, digital infrastructure and cybersecurity; research and development; skills, capacities and education; and Mexicans abroad.*

6. Conclusion

No aspect of your personal or professional life will be exempt from the transformation driven by Artificial Intelligence
- Amy Webb

The unavoidable transition towards 4IR, driven by the digital economy, calls for multi-disciplinary spaces which analyze the meaning and the positive and negative impact of the accelerated adoption of emerging technologies, and which take us to the creation of mechanisms for AI to help solve the most pressing current challenges in a way that respects human rights and that seeks to reduce inequality gaps.

AI, as a general-purpose technology that creates learning and future predictions based on patterns identified in historical data, promises an attractive economic growth, with the possibility of increasing the regional GDP by 5.4% by 2030. However, it is important to remember that the benefits will be shared only among the countries that opt for the adoption of AI, both in the private and the public sectors.

Even though AI is emerging as a tool capable of having a positive impact on the fulfillment of the SDG, it is a complex and delicate technology because of the risks brought about by the use of data, and because of the collateral effects its adoption may have for society. That is why an approach for a responsible and ethical use of AI is vital, where there are inclusive processes, diverse teams, trust, protection of human rights and of minorities, and respect for individuals' privacy. In spite of the multiple risks associated with AI, it is important to take into account that, to a great extent, they can be mitigated through timely planning, aligned with regulatory frameworks and comprehensive agendas, such as national AI strategies and other mechanisms.

The path Latin America should follow to take advantage of AI ought to be defined internally in a collaborative manner through regional debates surrounding the definition of ethical principles, the formation of capacities in the public and private sectors, the development of legislation, regulations and pilot tests of innovative mechanisms for the access and responsible use of data, together with new concepts such as TechPlomacy, which prioritizes collaboration among sectors. For the region, it will be essential to participate actively in the global conversations about AI governance and to explore new opportunities in order to accelerate the regional well-being and, at the same time, to keep strengthening the connectivity and digitalization of the population.

The actions taken for the short, mid and long term from a collaborative regional model and the capacity to coordinate existing initiatives on digital economy and on the development and adoption of a responsible AI will determine the future of the region, affecting the life quality of citizens and the existence of social mobility opportunities for future generations.

Bibliographic references

Angwin, J. Machine Bias, ProPublica, 2016. Available on: https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing

Azuara Herrera, O., Pagés, C., Rucci, G., Amaral, N., Ospino, C., Torres, J. and González, S. El Futuro Del Trabajo En América Latina y El Caribe: ¿Cuáles Son Las Ocupaciones y Las Habilidades Emergentes Más Demandadas En La Región? (Interactive version), Inter-American Development Bank, 2019. Available on: publications.iadb.org/es/el-futuro-del-trabajo-en-america-latina-y-el-caribe-cuales-son-las-ocupaciones-y-las-habilidades-0.

Bartlett, M. Solving the AI Accountability Gap, in Medium, Towards Data Science, 2019. Available on: towardsdatascience.com/solving-the-ai-accountability-gap-dd35698249fe.

Disclaimer. The opinions expressed in the publication are the sole responsibility of the authors. Said opinions do not intend to reflect the opinions or perspectives of CETyS or any other organization involved in the project.