

Reliable Artificial Intelligence: The 18th Sustainable Development Goal

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Artificial intelligence (AI) brings countless benefits to humanity, but it carries serious risks and has profoundly disruptive ethical implications. In scientific research, generative artificial intelligence is already changing the way science is done, and its ability to increase the pace and quality of results is undeniable. In medicine, AI will be disruptive regarding the doctor-patient relationship given that generative AI systems allow the collection of information obtained from anamnesis, and thus suggest differential diagnoses and recommendations for treatment. Also, the financial sector, the judiciary, the creative arts, and environmental policies are deeply influenced by AI. The European Union, aware of the enormous complexity of AI, approved the Artificial Intelligence Act. This example of AI regulation may not be followed by other countries, so regarding global governance, a possible solution to regulate AI internationally would be for the UN to consider Trustworthy Artificial Intelligence as the 18th Sustainable Development Goal (SDG). AI will, directly or indirectly, radically alter life on Earth, meaning that all the seventeen current SDGs will be affected by artificial intelligence. Therefore, considering Trustworthy AI as the 18th Sustainable Development Goal might be a huge step for humanity and a fundamental legacy for future generations.

Keywords: Artificial intelligence, ethics, global governance, reliability, sustainable development goals.

Introduction

Never before has a technological development had the potential to change our lives as profoundly as artificial intelligence (AI). From the financial system and commercial transactions to the administration of justice, the health-care system and the artistic and creative sectors, AI is already permeating our daily lives, often without most people being aware of it. While it is true that AI brings countless benefits to humanity, it also poses serious risks and has profoundly disruptive ethical implications that need to be analyzed and, above all, prevented.

The objective of this article is to frame the anticipated evolution of AI within a sustainable development framework for humanity, focusing on economic, social, labor, and environmental aspects. It also aims to examine the extent to which the *Sustainable Development Goals*—set by the United Nations as benchmarks for the future evolution of humanity—are affected by artificial intelligence.

Indeed, artificial intelligence possesses profoundly innovative characteristics that could represent a paradigm shift in science and even in civilization (Harari, 2024). It is not merely a digital tool or an instrument that assists in decision-making. The ability to learn how to learn, to use human language without limits in any context, and to operate within a digital network make AI both fascinating and concerning. Additionally, AI systems can incorporate devices equipped with mobility in the physical space—such as social robots or even humanoids robots (Constantinescu and Crisp, 2022) — which will make coexistence and interdependence with the super AI currently being developed acceptable (if not desirable).

In scientific research, for example, generative artificial intelligence (such as ChatGPT) is already changing the way science is conducted, and its ability to enhance the pace and quality of results is undeniable (Mann et al., 2023). However, the lack of explainability in AI — the inability of humans to understand how AI reaches certain conclusions — makes the scientific process difficult to replicate and therefore to verify. Replicability and explainability, especially when combined, represent one of the main ethical issues of AI in science and research (National Academies of Sciences, 2019). The concept of replicability is based on evaluating the reliability of the scientific method used.

In other words, the assumption is that applying the same method by a different researcher to the same scientific question should yield the same results (Ioannidis, 2018). The lack of explainability in AI means that the replicability of research conducted in AI and with AI is difficult to verify. This implies that in a global society, with strong connectivity and based on technological

development, it is necessary to rethink copyright, the acquisition of patents, the assessment of individual merit and the way university rankings or research laboratory evaluations are determined, among other aspects. This is an area where ethics and scientific integrity must be particularly considered (Nunes, 2017).

AI has serious implications across all dimensions of knowledge, in all areas of activity, and in all cultures of humanity. For example, in healthcare, especially in medicine, AI will be disruptive at various levels (Mittelstadt, 2021). In the context of the doctor-patient relationship, generative AI systems can collect information obtained during the medical history and thus suggest alternative diagnoses and recommendations for diagnostic and treatment aids (World Health Organization, 2021). The intersection of AI with existing metadata (big data, lake data, etc.) in the digital space creates a paradoxical situation in which artificial intelligence can come to know a person in more detail than their own family and friends.

The European Union, rightly aware of the enormous complexity of artificial intelligence, including machine learning and deep learning, as well as the potential for these systems to invade individuals' private spheres, including access to personal and confidential data, has approved the Artificial Intelligence Act in the European Parliament (European Commission, 2024). This is an initiative of great political relevance not only in Europe but also on the international stage, as it marks the first time the international community has acknowledged the risks of AI and the need for effective supranational supervision and oversight. Nevertheless, given that the scope of the AI Act is geographically limited, new forms of global regulation are desirable. Previously, in 2016, the approval of the General Data Protection Regulation was already a precursor to the regulation of digital technologies in contemporary society (European Union, 2016), a regulation with significant international impact.

However, this example of regulating AI through risk stratification, determining what is or is not appropriate and legitimate, may not be followed by other countries, and variable geometry in this area is not acceptable. Therefore, in terms of global governance, one possible solution for regulating AI internationally would be for the UN to consider Reliable Artificial Intelligence as the 18th Sustainable Development Goal (SDG). In fact, with a view to guaranteeing future generations a brighter future than is currently anticipated, the United Nations has proposed seventeen Sustainable Development Goals (**Table I**) in order to ensure the harmonious development of the planet and its societies (United Nations, 2024). The values underpinning this proposal focus on respect for the human person as a subject with intrinsic dignity and fundamental rights, equality and social integration, global justice

and respect for the environment and the commonwealth of life. (European Commission, 2019).

Table I

Sustainable Development Goals

1. End poverty in all its forms and in all places.
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3. Ensuring a healthy life and promoting well-being for all, at all ages.
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Achieving gender equality and empowering all women and girls.
6. Ensure the availability and sustainable management of water and sanitation for all.
7. Ensure access to reliable, sustainable, modern and affordable energy for all.
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9. Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
10. Reduce inequality within and among countries.
11. Make cities and human settlements inclusive, safe, resilient, and sustainable.
12. Ensure sustainable consumption and production patterns.
13. Take urgent action to combat climate change and its impacts.
14. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.
15. Protect, restore, and promote the sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and stop biodiversity loss.
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels.
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

It is therefore important to analyze the potential influence of AI on these strategic UN objectives for sustainable development—objectives defined in

Transforming Our World – the 2030 Agenda for Sustainable Development. In fact, the United Nations has played a decisive role in recent years through the creation and implementation of the Sustainable Development Goals. A detailed analysis shows that while AI is not a specific objective of any of them, it has a transversal impact on all the goals.

Indeed, AI will, directly or indirectly, radically alter life on Earth. As a result, virtually all of the seventeen current SDGs will be affected by artificial intelligence. Given that the 2030 Agenda addresses several dimensions of sustainable development and aims to promote peace, justice, and the creation of effective institutions, it seems inevitable that the limits of AI applications will need to be redefined. The following will analyze how the different SDGs will potentially be impacted by artificial intelligence.

Sustainable Development Goals

Demography is one of the major global challenges of the 21st century. The gradual improvement in socioeconomic living conditions was associated with a considerable decline in the global poverty rate (measured as the number of people living below \$1.90 per person per day – headcount poverty) from 36% of the population in 1990 to 7% of the population in 2030 (Kharas and Dooley, 2022). This evolution, which is also associated with a universal increase in the quality of healthcare, education, and other social goods, has made it possible for the average life expectancy to grow sustainably throughout the planet since the end of the 20th century (Nunes, 2022).

Indeed, the welfare state that has been built over the past decades in many countries must be considered an important civilizational achievement, allowing the general population to reach satisfactory levels of well-being. Still, we have not been able to completely eradicate poverty and social exclusion due to its significantly associated poverty rate, even in societies with greater human development. In fact, people with disabilities, dependent elderly individuals, single parents, the homeless, low-paid workers, or prisoners are particularly vulnerable groups whose poverty is generally linked with the phenomenon of social exclusion. Thus, a modern welfare state must have a clear perception of the phenomenon of poverty because it has serious consequences for well-being and for individuals' achievements in life. Poverty is a multidimensional problem that needs to be addressed (Alkire and Foster, 2011). Child-specific deprivation is even more problematic, and monetary child poverty and material deprivation should be a priority of the welfare state (Chzhen et al., 2016).

End poverty in all its forms everywhere, end hunger, achieve food security and improved nutrition, and promote sustainable agriculture, and ensure

healthy lives and promote well-being for all at all ages (Alkire and Jahan, 2018) are goals that AI could significantly enhance in the near term. How? At the national level the welfare state must be essentially reinvented at the level of financial sustainability. Despite the implementation of measures to increase efficiency, a welfare state's economic and financial viability has not been guaranteed yet. The welfare state should be sustainable and AI will play a definite role in this evolution. For instance, generalizing the use of telehealth or activating ageing well cities all over the world. It must respect the core values of modern societies, and not forget the impact of economic and cultural globalization on citizens' income levels and well-being.

However, economic development must not be dissociated from a concrete model of human development (Human Development Report, 2016). As one of its core objectives, the welfare state must promote the development of a society considering not only traditional development indicators but also complementary indicators, such as the Multidimensional Poverty Index (MPI), the Gender Inequality Index (GII), or even the Inequality-Adjusted Human Development Index (IHDI) (Alkire and Foster 2010). A modern, AI-powered and sustainable vision of the welfare state may be the answer to a variable geometry that exists on a global scale (Daniels and Sabin, 2002).

Also, from a global health perspective health should be seen as a "One Health" unified approach as the wellbeing of people, animals and the ecosystems are deeply intertwined and integrated. This interdependency is essential for a full interdependent human development and for sustainability to be achieved. This view has an enormous impact, for instance, in antibiotic production and consumption, or in the prevention and control of zoonoses. And AI will be a fundamental tool to promote this integration due to its speed, reach and connectedness. Indeed, this "One AI Health" could provide deeper insights, better predictions, and more targeted preventive strategies (Ho, 2022).

Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all is a central goal for full human development, representing an obvious issue of justice and equity (Nagel, 1991). Education is rightly considered an essential pillar of the integral development of each individual in all modern and competitive societies. Moreover, envisioning a global policy in this area requires determining the objectives of the educational process. It is now generally agreed that there must be a clear and unequivocal commitment to empowering children and young people throughout their lives. Digital literacy is now the primary tool for implementing this commitment.

In other words, education is a continuous process, regardless of a person's age or their level of academic differentiation. For example, the *Convention*

on the Rights of the Child states that education aims, among other things, to “promote the development of the child’s personality, talents, and mental and physical abilities to the fullest extent of their potential”. Furthermore, society must “prepare the child to assume the responsibilities of life in a free society [...]”. Article 28 of this Convention goes further by specifically referring to the “right of the child to education, with a view to progressively ensuring the realization of this right on the basis of equal opportunities” (UNICEF, 1990). It is clear that it is not only about guaranteeing the right to education as a citizenship right, but that this right must be exercised in genuine equality of opportunity.

Education is an individual right grounded in the dignity of the human person, beginning with the right to recognition of personality (the student as a subject of education), the right to the development of personality (creative freedom and expression), and the right to difference (plurality of opinion and diversity of perspective in a society where citizens encounter one another as moral strangers). Thus, it is a duty of society and a social investment to ensure its universal implementation. AI can make a significant contribution through the inherent democratization of access to and use of new digital technologies, fostering more fruitful sociocultural development (influencing socioeconomic gradients, health indicators, healthy lifestyles, democratic participation, gender equality, the protection of minorities, etc.).

Furthermore, AI can help address the question of “what to teach and how to instruct” by utilizing generative artificial intelligence and all the training data it is fed (Kung et al., 2023). In the global village, where the medium is the message (McLuhan and Powers, 1989), the educational process should be maximized to convey democratic values of respect for the human person and the commonwealth of life (Nunes et al., 2015). AI can contribute to the holistic development of individuals within a culture of responsible citizenship, where rights and duties are affirmed in an ethic of responsibility. It also has the potential to actively support vocational training and competitiveness, enhancing employability and mobility in light of the natural replacement of work occurring with the digital transition (Stahl, 2021). Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all is a central goal for full human development.

Another essential SDO is to achieve gender equality and to empower every woman and girl. Gender equality means that women and men enjoy equal conditions to achieve their full human rights and contribute (benefit) to (from) economic, social, cultural, and political development. Gender equality is, therefore, the condition in which society equally respects both the similarities and differences between men and women and the roles they play. It is based on women and men being full partners in their homes, their

communities, and society. This perspective, supported by many relevant international conventions, recognizes the importance of gender diversity, as each person must be free to attain fulfillment and make choices they deem most appropriate. According to United Nations Educational, Scientific and Cultural Organization (UNESCO) (2014), “gender” gender refers to the social meaning of being a woman or a man, including the social characteristics (not biological differences) used to define a woman or a man. Gender is a distinct concept from “sex,” which refers to the biological differences between men and women.

Therefore, to promote gender equality, the active participation of society is essential, along with a strong commitment from various institutions, for true equality depends on excellent civic and cultural education. Indeed, gender equality has come a long way and has already overcome significant barriers in some developed countries, particularly in terms of access to the healthcare system, including reproductive health and health education. Moreover, some societies have made substantial progress in political, economic, and cultural participation. However, there are important differences not only regarding wages and pensions but also access to top positions in public administration and top positions in private sector companies (Nunes, 2024).

Despite this evolution, the Human Development Report 2019 states that, “Gender disparities remain among the most persistent forms of inequality across all countries. Given that these disadvantages affect half of the world’s population, gender inequality is arguably one of the greatest barriers to human development (World Economic Forum. 2024). All too often, women and girls are discriminated against in health, in education, at home, and in the labor market – with negative repercussions for their freedoms” (United Nations, 2019). However, as Zanetti claims, “The digital era offers many opportunities to promote gender equality. Improved access to education, economic empowerment, entrepreneurship, political engagement, networking, work-life balance, and health services contribute to advancing women’s rights and opportunities” (Zanetti and Nunes, 2024).

AI also has the potential to ensure the availability and sustainable management of water and sanitation for all. According to the principles of responsible stewardship and inclusive, deliberative participation (Jennings et al., 2024), issues such as water reuse and mechanisms for achieving this, including desalination (the conversion of saltwater into drinking water), the use of treated wastewater for controlled irrigation systems and other purposes, and the utilization of rainwater can be optimized by AI. Indeed, the integration of AI in water management will eventually reshape the landscape of water conservation, treatment, irrigation, policy formulation, watershed management, and the monitoring of groundwater and surface water.

Access to reliable, sustainable, modern, and affordable energy for all can also be enhanced (Ogundiran et al., 2024), promoting sustained and inclusive economic growth, full and productive employment, and decent work for everyone. However, for this to happen, AI must be reliable and under human supervision. “Human in the Loop” is a prerequisite in these areas. Indeed, new demographic trends, changes in the labor force, energy transformation, climate change, social networks, and individualization are factors that must be addressed alongside AI implementation. A good example of this is the transformation of traditional cities into modern smart cities. AI has the potential to elevate smart cities to a new level.

Why? Because AI-driven smart cities are not just about using networks or digital solutions in a traditional way, but rather about creating a modern, AI-powered integrated system that benefits inhabitants, businesses, and the environment, making cities safer and more sustainable. This approach addresses the needs of elderly and disabled people differently and promotes smarter urban transport networks, upgraded water supply, and waste disposal facilities (European Commission, 2024b). This helps make cities and human settlements inclusive, safe, resilient, and sustainable. Indeed, the majority of the world’s population lives in cities, which must tackle some of society’s most pressing issues, from security and education to health and the social integration of migrant populations. With AI, smart cities could become even smarter and could evolve into AI-powered metropolises (Standard & Poor Global, 2024). The potential of AI in the operational management of organizations can also decisively contribute to the construction of resilient infrastructures, promote inclusive and sustainable industrialization, and foster scientific and technological innovation. It is collectively intelligent (Ryan et al., 2020) to adopt an AI vision centered on global public interest.

Moreover, if utilized appropriately, AI can reduce inequality within and between countries. This implies that the implementation of public policies for education in new technologies, particularly in AI literacy, is a necessity in the short term. Such education should be mandatory at both the elementary and secondary levels. This AI-induced democratization can be an extraordinary tool for social harmonization, provided that special attention is given to the new inequalities that may arise due to digital exclusion, such as those affecting the elderly and disabled. The benefits of AI as global public goods should be shared universally so that all people can benefit. In any case, it is essential to consider the rapid replacement of workers by autonomous robots, necessitating the implementation of a universal basic income in all countries—an unconditional transfer payment. Although this income does not replace work as a means of self-fulfillment and personal actualization, it

may serve as a vital safety net for those affected by technological advancements.

AI also has the potential to ensure sustainable production and consumption standards through various means. It can alter production processes and transform the economy into a circular model that efficiently reuses resources. Additionally, AI can promote a more balanced and intelligent approach to consumption that does not compromise global development. This transformation makes it possible to take urgent measures to combat climate change and its impacts in different parts of the world. Moreover, AI can help conserve and sustainably utilize oceans, seas, and marine resources, protect, restore, and promote the sustainable use of terrestrial ecosystems, manage forests effectively, combat desertification, halt and reverse soil degradation, and stop biodiversity loss. These goals can be advanced through AI to ensure the sustainable development of humanity. All of these objectives must be commitments embraced by everyone, grounded in profound respect for the rights of future generations.

Promoting peaceful and inclusive societies for sustainable development, providing access to justice for all, and building effective, accountable, and inclusive institutions at all levels are objectives that can also be enhanced by AI. Indeed, AI will enable people to develop their full capacities more easily on an equal opportunity basis. Following Sen's account of justice, individual capabilities should be enhanced to promote human freedoms (Sen, 1989, 1999). AI is the perfect tool for the full development of these capabilities, provided that access to new technologies is guaranteed and that they are sufficiently user-friendly.

Finally, AI can and should strengthen the means of implementation and revitalize the global partnership for sustainable development. To accomplish this goal, the education and science systems in every country should foster high-quality and inclusive lifelong learning for all. Additionally, there must be a promotion of inter-sectoral cooperation between education, science, and healthy lifestyles. AI can also empower learners to be creative and responsible global citizens, as sustainable development offers a fair and universally accepted approach to citizenship, contributing decisively to a true capacity-building strategy. Furthermore, the digital economy, e-health, big data, artificial intelligence, and ethics are important tools for uniting the global community and promoting worldwide health literacy, especially in low- and middle-income countries.

AI can clearly support inclusive social development and foster intercultural dialogue. By promoting universally accepted scientific and ethical principles, sustainable development encourages autonomous and responsible deci-

sion-making throughout a citizen's life cycle, leading to a fair and equitable society in alignment with global principles of justice (United Nations, 1948).

The values inherent to sustainable development promote freedom of expression and freedom of choice. International scientific cooperation—particularly through AI-powered global networks—will contribute to more sustainable global development. Only well-informed citizens, who are fully aware of their rights and responsibilities, can, in the long run, promote the need to protect the commonwealth of life, the richness of biodiversity, and the threats posed by climate change. Through knowledge sharing, building partnerships, and international multilateral cooperation, the goal of promoting responsible and trustworthy AI will be achieved. Raising awareness of specific AI challenges and the necessity for a new digital global literacy is both an imperative and a responsibility of international organizations.

Conclusion: Reliable AI as the 18th Sustainable Development Goal

For AI to be deemed reliable, it must adhere to ethical standards that assure citizens and society as a whole that ethical principles and values are upheld in the research, development, and implementation of new digital technologies across all sectors of human activity. This entails compliance with legal frameworks, ensuring that laws and regulations are rigorously followed. Researchers, big tech corporations, and governments must maintain a fiduciary relationship with society, particularly in sensitive areas such as health and finance, to prevent unforeseen consequences from overshadowing the robustness and efficacy of AI systems. Thus, AI reliability encompasses not only the systems themselves but also the processes and individuals responsible for managing them.

To be reliable, AI must also be safe. AI safety refers to the protection against unacceptable harm caused by the use of artificial intelligence. Ensuring safety in AI relies on a combination of technological practices—such as adequately specifying functional objectives and implementing suitable learning processes—and regulatory mechanisms that guarantee AI systems operate as intended without unintended consequences. Key factors in achieving safety include the integrity of algorithms, effective data protection, and compliance with regulatory standards. In the long term, failures in AI safety could pose an existential risk to society and lead to a complete breakdown of trust. In health and life sciences, it is essential to implement appropriate AI governance in areas like individual privacy protection and the handling of train-

ing data to prevent biases that could compromise the performance of clinical AI applications.

Since AI relies on systems, processes, people, and policies across diverse countries and cultures, establishing an innovative and accountable governance framework is essential for ensuring its reliability at a global level. While legislation and regulation are necessary, they alone are not sufficient. If the international community genuinely aims to protect the planet and promote peace and prosperity, there must be a more harmonious distribution of wealth and equitable access to the benefits of research and technology.

This new Sustainable Development Goal (SDG) should take into account, among other aspects, that for AI to be truly reliable, it must be explainable and understandable to humans. It should promote justice, equality, and privacy, and always be subject to human oversight and control. In addition to regulatory instruments at both national and international levels, considering Reliable Artificial Intelligence as the 18th Sustainable Development Goal would represent a significant step for humanity and a fundamental legacy for future generations.

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