SCIENCE FOR GLOBAL TRANSFORMATION
ARTIFICIAL INTELLIGENCE: ETHICS, SOCIAL IMPACT, REGULATION, AND KNOWLEDGE SHARING
Task Force 1 - Preliminary Document

Introduction

The progress of artificial intelligence (AI) technologies holds the potential to accelerate scientific advancements and research productivity. AI can empower scientists across diverse fields with these new tools. By integrating digital technologies and data science with disciplines such as physics, chemistry, biology, medicine, materials science, and engineering, the pace of scientific research can be significantly expedited, leading to valuable societal impacts. Although AI is being used in various sectors and phases of scientific research, its complete potential remains largely untapped. As developing nations strive to attain scientific and technological relevance, it is essential to prepare for these transformations by equipping the scientific community with skills and resources to work and develop artificial intelligence technologies. Additionally, it is vital for developing countries to collaborate as partners and active participants in constructing large scientific databases, mastering relevant methodologies and techniques within their respective fields of interest. Achieving this requires investments in infrastructure for data storage, communication, and world-class high-performance processing, as well as the training of qualified personnel capable of harnessing the power of AI technologies.

Artificial intelligence is a science and a powerful set of general-purpose technologies that offer opportunities to boost economic and social growth in developed and developing countries. AI is increasingly becoming an essential element in the research and innovation ecosystem, with the potential to drive discoveries, innovation, and economic growth in all areas of science and across all sectors of the economy and society. The adoption of digital technologies and data science across various sectors of society have resulted in the silent integration of AI. These technologies offer advantages, but also pose risks and tend to exacerbate economic inequality, disproportionately affecting certain communities over others.

AI and Sustainable Development Goals

The G20, together accounting for 85% of the world's GDP and two-thirds of its population, plays a pivotal role in shaping the global digital technology landscape. Since the establishment of the United Nations Sustainable Development Goals (SDGs) agenda, the G20 has sought to explore the use of digital technologies and innovation to advance the 2030 Agenda. The pervasive influence of AI extends across various sectors, including agriculture, biotechnology, education, engineering, humanities, environment, health, among others, which are important sectors for the SDG transformations. In the context of major global challenges, healthcare systems have become a central focus of the G20 in recent years. The COVID-19 pandemic has underscored the need for coordinated responses among countries and healthcare providers with respect to digital health. In the most recent years, the G20 meetings highlighted the importance of digital health and data modernization in strengthening healthcare systems, where AI is a technology capable of bringing about unimaginable changes. Its ability to analyze vast amounts of data, predict trends, and make forecasts can assist in disease identification, patient care, and efficient resource allocation, ultimately saving lives and reducing costs.

Building Capacity in Artificial Intelligence (AI)

AI education at all levels and research capacity need to be built to allow countries to develop their own solutions to their specific problems and to play their part in the international scientific and technological arena. Harnessing the range of opportunities offered by AI requires understanding and managing the associated benefits and risks. Therefore, effective investments in research, development, and innovation (RD&I) and in human resources development are necessary. These investments should pave the way for seeking solutions to countries' challenges, promoting responsible innovation, contributing to the public good, protecting people's rights and safety, and advancing democratic values.

Several approaches can support the development of talent within the country's educational system and promote a skilled workforce nurtured domestically. Human resources development should promote research and development with public and private investment, encourage collaboration between university researchers and private sector counterparts to foster innovation, and reassess the educational sector at its foundational levels. Educating and training young individuals – who can understand AI issues, exhibit critical thinking, create cutting-edge solutions, and prioritize domestic solutions – represent a fundamental challenge.

Artificial Intelligence in the Developing Countries

AI already plays a significant role in guiding decisions, be it in the private or in the public sector. The rapid advancement of AI technologies raises legitimate concerns, including the potential for mass unemployment that could disproportionately affect large portions of the workforce in developing countries, thereby exacerbating existing inequalities. The adoption of AI in public services requires a comprehensive and reflective assessment of the advancements. This evaluation should encompass not only the immediate costs and benefits but also the implications for democratic institutions and social cohesion. A positive impact would be achieved with the development of AI technology aimed at national issues while aligning with international needs and challenges. This impact should extend to various areas in the social and economic fields. In summary, it's also essential to address topics like: What are the main benefits of AI for society? How can AI be used as a lever for social inclusion? How can AI be used to build more efficient public services?

Developing nations cannot risk to remain solely consumers of AI solutions created abroad. Dependency on other countries and large corporations in this field can undermine national security, sovereignty, and the competitiveness of national companies both domestically and internationally. The lack of technical knowledge in AI will perpetuate growing dependence on major corporations and dominant technology countries. Governments should aim at building capacity to develop AI independently for sensitive systems, reducing their dependence on the private sector. This autonomy is essential for maintaining control over critical products and ensuring the preservation of ethical standards.

Ethical Concerns and Regulatory Measures

Despite potential benefits and opportunities, there is concrete evidence that AI technologies can cause harm to individuals, groups, societies, and the planet. Concerns include privacy violations, the creation of anti-competitive environments, behavior manipulation, and environmental disasters. AI algorithms

already enable the identification and exploitation of vulnerabilities and biases, including cases of perpetuating racial issues and other forms of discrimination.

It's imperative to maintain a strong ethical foundation for the public sector's utilization of AI. As AI plays an increasingly significant role in decision-making, it's crucial to prevent its misuse in ways that undermine democracy or infringe upon human rights. It is crucial that ethical and social risk considerations guide the establishment of principles, rules, and legislation to minimize technology risks. Furthermore, it is essential that society participates in discussions about the limits of AI use. Different actors in society have expressed concerns about these technologies. Scientists are interested in protecting national development on par with international advancements, avoiding delays or limitations in scientific and technological progress, and providing equality in scientific and technological development and the generation of innovations and wealth.

Concluding Remarks

The formulation of ethical principles that prioritize the well-being of humankind and the planet health is crucial in the realm of AI. The development and deployment of AI should be aligned with fundamental values such as equity, responsibility, transparency, and safety. Promoting inclusivity and preventing biases, discrimination, and inequalities from infiltrating AI systems is of utmost importance. Furthermore, the discussion surrounding the need for effective controls and regulation on artificial intelligence is essential to mitigate potential risks. To address these concerns, the establishment of a global AI governance structure may be necessary. It should be designed to accommodate and respect cultural differences while bridging gaps between diverse national legal frameworks. By prioritizing ethical principles, promoting inclusive development, and engaging in constructive discussions on AI governance, we can foster an AI landscape that aligns with human values, safeguards against risks, and promotes the well-being of individuals and societies worldwide.

The sense of urgency regarding investments in AI and the formulation of public policies has emerged as a crucial priority worldwide, encompassing both developed and developing countries. There is a need to accelerate discussions on AI regulation worldwide, as this is of key importance for establishing international partnerships and collaborations in the field of AI. The primary challenge in crafting AI national regulation is to ensure that the rules and laws are fair, inclusive, and protect society and democracy while aiming to reduce inequality levels in the country. At the same time, they should not impede or halt the development of emerging technologies. This is a sensitive, dynamic challenge that should be discussed by various sectors of society. The emerging model for AI technologies in various countries shows that the development of AI depends on multiple factors, including the public policies that each country defines for its data, both public and private. The world has become data-driven, forming the foundation for the rapid growth of AI applications in all fields of knowledge, with extraordinary implications for productivity, competitiveness, and global trade.

The role of science in AI is pivotal for shaping the future trajectory of societies worldwide. Breakthroughs in machine learning, cloud infrastructure, and data processing and analytics have become crucial in this landscape, involving stakeholders from diverse sectors and playing a vital role in driving discoveries across all scientific areas. In the context of the G20, the Science20, through its members, can harness global conversations, together with other key multilateral organizations (such as the UN, OECD, and the World

Economic Forum), about the governance of artificial intelligence technologies, the sharing of knowledge, the development of scientific tools, besides the discussions on ethics, privacy, and regulation.