Technology and Innovation Report 2025

Chapter V

Global collaboration for inclusive and equitable AI

International AI governance initiatives are highly fragmented and dominated by developed countries. AI technology is largely controlled by a few technology giants, which are likely to prioritize profits over societal benefits, and it can be deployed virtually anywhere, extending its influence beyond borders.

Therefore, Governments should act to establish international guidance on AI development that favours public interest and promotes AI as a public good. Most developing countries have significant stakes in the future of AI but have limited influence over the direction it takes, which may result in a failure of global AI governance.

This requires multi-stakeholder cooperation to make AI accessible and beneficial for everyone and foster inclusive innovation in tackling global challenges. A comprehensive global framework for AI should incorporate accountability mechanisms for companies, Governments and institutions. UNCTAD, in this report, advocates an AI-for-all approach, addressing infrastructure, data and skills, to steer the technology towards shared goals and values.

United Nations

Key policy takeaways

- **A framework for industry commitment** – Public disclosure of AI systems can improve transparency and accountability. One possible model is the environmental, social and governance (ESG) framework. An AI equivalent could involve impact assessments throughout the AI life cycle and detailed explanations by developers of how AI systems function. Once shared standards have been established, certification could shift from voluntary to mandatory reporting, supported by measures to oversee compliance.

- **Shared digital public infrastructure** – A global shared facility, for example following the CERN model, can provide equitable access to AI infrastructure. Governments can also collaborate with the private sector through public–private partnerships to expedite the development of digital public infrastructure (DPI) for AI in local innovation ecosystems. Tailored DPI systems can offer essential resources and services to support AI adoption and development.

- **Open innovation** – Open innovation models, such as open data and open source, can democratize knowledge and resources to foster inclusive AI innovation. The international community can benefit from coordinating and harmonizing the valuable but fragmented open-source AI resources worldwide. Connected and interoperable repositories with common standards can enhance the global knowledge base and improve access through trusted hubs that ensure quality and security.

- **A global hub** – An AI-focused centre and network modelled, for example, on the United Nations Climate Technology Centre and Network, can function as a global hub for building AI capacity, facilitating technology transfer and coordinating technical assistance to developing countries.

- **South–South collaboration** – Strengthening South–South cooperation in science and technology, through building regional innovation hubs and expert networks, can contribute to enhancing the capacity of developing countries to address common AI challenges. Provisions for AI technology and services could be included in existing trade agreements, while regional institutions can assist in sharing best practices and developing coherent AI policies.

A. The need for global AI governance

AI can be replicated and deployed virtually anywhere, extending its influence beyond borders

Many AI-related issues can be addressed at the national level through well-designed policies. However, as AI encompasses intangible goods and services that can be replicated and deployed virtually anywhere, its influence extends beyond borders, necessitating international collaboration. Ensuring AI as a public good requires a collective multi-stakeholder effort to make it accessible, equitable and beneficial for all, driving inclusive innovation to tackle global challenges.

AI is set to change the technological, economic and social landscape, presenting new opportunities and risks while requiring stronger global collaboration, including the following:

- ***Reshaped economic opportunities*** – AI shifts innovation and value creation towards knowledge-intensive sectors, reshaping economic opportunities and power relationships in a multipolar world. It is also transforming traditional sectors and businesses, leading to greater servicification across economies. This can energize economic activities and open new opportunities, but it can also displace workers and undermine the comparative advantage of developing countries in low-cost labour.
- ***Dominant companies*** – AI development and deployment are led by a handful of large multinational companies. Private enterprises are driven by profit motives for shareholders, but their decisions can affect the whole of society. Larger countries can seek to regulate these companies but smaller countries, particularly less developed ones, may lack institutional capacity and economic strength. They may, therefore, be subject to decisions made elsewhere unless consistent international cooperation and common principles on AI are established.
- ***Rapid diffusion*** – New foundation models and AI applications can be diffused virtually everywhere in a short period of time. They can therefore impact economies and business worldwide before policymakers become aware of their existence. For example, Facebook took about 10 months to reach 1 million users and the platform known at the time as Twitter, about two years; in contrast, ChatGPT reached 100 million users in only two months (Hu, 2023). Such rapid diffusion requires international coordination in regulation and monitoring, aiming for broader societal goals that benefit the global community (Cihon, 2019).
- ***Slow regulatory adaptation*** – Technological advances often outstrip the pace at which current regulatory frameworks can adapt, particularly in countries with lower levels of development. This means that hundreds of millions of people in developing countries cannot influence the direction of technological change but are nevertheless exposed to possible negative consequences. This includes different types of bias, as AI technologies trained on skewed or discriminatory data are likely to ignore particular social, economic, environmental and cultural contexts, with the risk of deepening existing data divides (UNCTAD, 2024a). Regulatory mechanisms that differ from one country to another may result in inconsistent or contradictory impacts across countries, sectors or parts of society, distributing benefits and costs in an uneven and unfair manner.

- ***Cross-border flows of data and skills*** – AI applications are spread across digital infrastructures and rely on digital skills and vast amounts of data that flow through international hubs. Cross-border flows are growing rapidly in digital trade, international commerce and Internet platforms and services. This digital economy shows increasing returns to scale, which can trigger a self-reinforcing dynamic whereby more data translates into value that in turn enables the collection of even more data (UNCTAD, 2024a). Moreover, certain categories of workers are increasingly able to participate in the global labour market either through online freelance and virtual work or by relocating to countries with more or better job opportunities. Such labour flows are typically from developing to developed countries.

B. Aligning AI with social objectives

The dominance of multinational tech giants

Technology leadership by the private sector is not new. What is new to AI is the unprecedented level of control and understanding that private companies have over the technology, an imbalance that limits the ability of Governments to steer AI development in the public interest.

The current AI boom relies on decades of academic work, such as in machine learning and natural-language processing, but most of the latest cutting-edge and high-profile research is carried out by private companies and is not published in peer-reviewed scientific journals. In 2023, researchers in corporations contributed only 3.8 per cent of AI-related academic papers. Most knowledge is being created behind closed doors, limiting the potential for learning and idea spillovers (Owens, 2024; Oxfam International, 2024).

The dominance of multinational technology corporations in AI is pronounced and can be considered an oligopoly due to their market power. For example, Alphabet, Amazon and Microsoft control over two thirds of the global cloud market through their computing services and storage capacities (Lynn et al., 2023).

For the graphics processing units that are critical for large-scale computation, there is a virtual monopoly, with Nvidia having a 90 per cent market share in the third quarter of 2024 (Jon Peddie Research, 2024).

Private companies correspondingly dominate investment in AI. In 2021, the industry worldwide spent over $340 billion, compared with $1.5 billion spent by United States Government agencies (excluding the Department of Defense) and $1.1 billion spent by the European Commission (Owens, 2024; UNCTAD, 2021a). The Government of China has increased support to AI-related firms through various State-backed initiatives that have amounted to $210 billion over the past decade (Beraja et al., 2024). In general, private companies have the resources to attract and retain high-skill employees. Between 2004 and 2020, the proportion of graduates from universities in North America with PhDs in AI-related fields working in the industry increased from 21 to 70 per cent (Ahmed et al., 2023). Multinational technology corporations also draw talent and resources from domestic firms, which can hamper knowledge spillovers within economies (Holm et al., 2020).

The dominance of a few private companies in AI is creating new security risks. One programming error can have rapidly diffused effects around the world.

Recent advances in AI are **dominated by multinational technology corporations**

An AI oligopoly could create vulnerabilities for countries

Without external oversight, **businesses are unlikely to prioritize ethics and societal impacts**

For example, in July 2024, a faulty update of security software distributed by CrowdStrike crashed about 8.5 million Microsoft-operated systems, causing widespread global disruptions, and affecting business operations, as well as public and critical infrastructure (Oldager, 2024; Philstar, 2024; Weston, 2024).

Without external oversight, businesses are unlikely to prioritize ethics and societal impacts in their development processes or address potential issues such as biases or misinformation, on the grounds that this might make them less competitive, with lower returns for investors.

Even AI projects aimed at social impact may feel the pressures of the profit motive and capital markets. OpenAI, for example, was initially founded as a non-profit organization, but to secure the necessary capital it later established a for-profit subsidiary. At the time of writing, to make the company more attractive to investors, OpenAI is planning to restructure its core business into a for-profit benefit corporation that will no longer be controlled by its non-profit board (Hu and Cai, 2024).

Industry AI governance initiatives lack broad representation, potentially overrepresenting the needs and interests of large companies

Under the pressure of substantial profit-related incentives, self-regulation is likely to be ineffective. Rather than influence from public policy, control is often in the opposite direction, with companies putting pressure on Governments. Many technology companies have been influencing regulations and public policies (UNCTAD, 2021b). Moreover, while they may have an incentive to collaborate with Governments in large markets, they have less need to establish mutually beneficial relationships with smaller countries.

In response to the increasing concerns about market dominance that can stifle competition, a number of jurisdictions have opened antitrust investigations, for example, Germany, India, Japan, the Republic of Korea, the United Kingdom, the United States and the European Union (Chu, 2022; Gil, 2023; Milmo, 2024; Kim and Kim, 2024; The Yomiuri Shimbun, 2024; White, 2024).

The importance of a multi-stakeholder approach

If AI governance is to align the incentives of the private sector with societal development goals and the public interest, it should take a multi-stakeholder approach. The technology needs to be fair, namely, findable, accessible, interoperable and reusable (GO FAIR, 2016). It also needs to be care, namely, with collective benefits, authority to control, responsibility and ethics, and to prioritize people and purpose (GIDA, 2020).

International cooperation can use more accessible open-source technologies not only as cornerstones of science but also to accelerate innovation. Open innovation strengthens international cooperation in science, technology and innovation (STI) and favours knowledge diffusion and the creation of a common pool of capacities that can allow less endowed countries to benefit from AI development.

Currently, there are several industry bodies working on guiding and self-regulating the responsible development of AI. For example, the AI Alliance brings together technology developers, researchers, and industry leaders to advance safe and responsible AI rooted in open innovation. The AI Governance Alliance focuses on integrating AI technologies responsibly across industries and advancing technical standards for safe and advanced AI systems. The Frontier Model Forum advances AI safety research and identifies best practices for AI development and deployment.

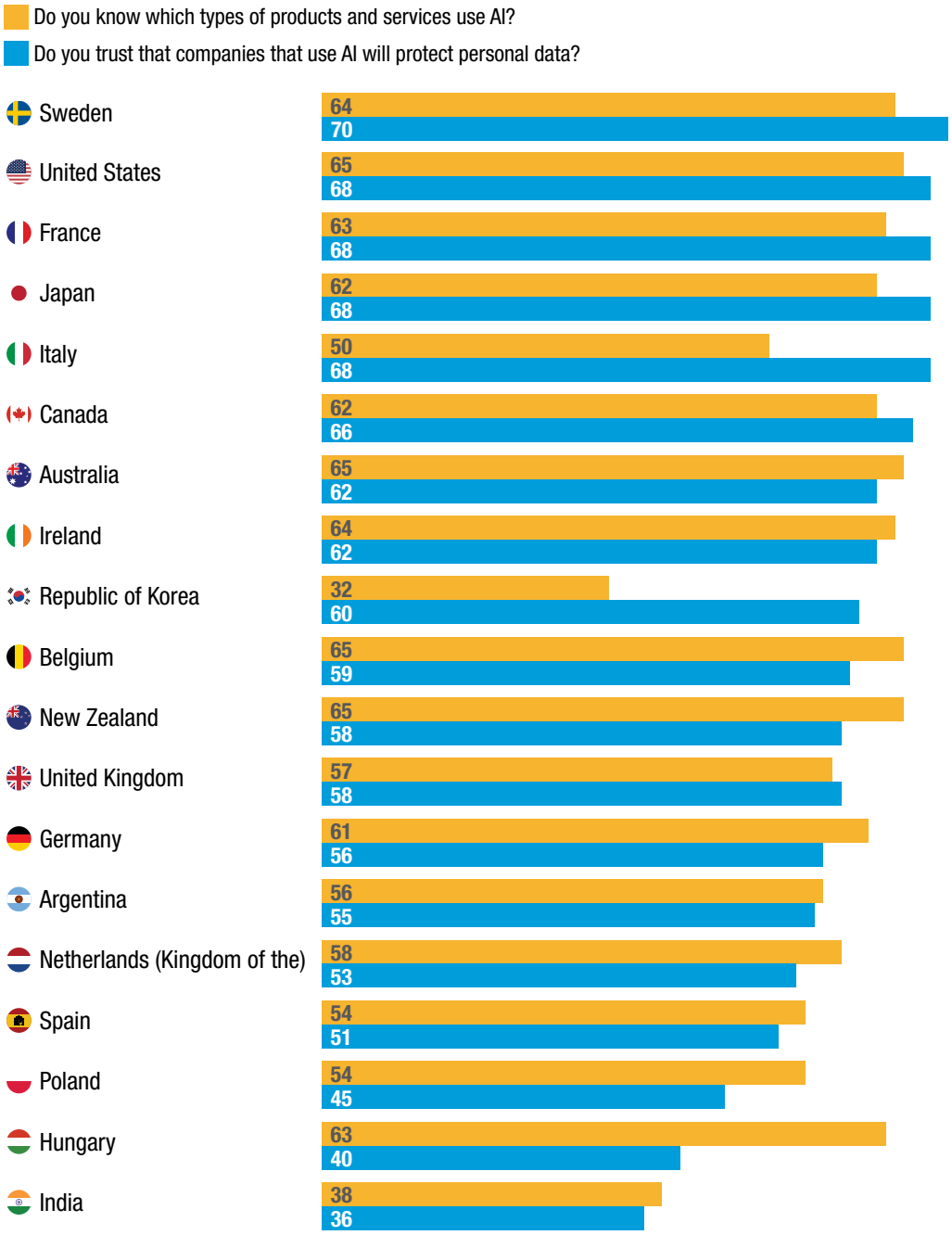
These initiatives are important but lack broad representation. The Frontier Model Forum, for example, involves only a handful of large technology corporations. The more inclusive bodies involve at most a few hundred entities, mainly from developed countries. Only large companies have the resources to participate in different discussions and assert their perspectives across various forums.

The need to include consumer views

International AI governance should incorporate public opinions, aspirations and concerns.

Figure V.1 shows the results from a multi-country survey on how people feel about AI, highlighting concerns about personal data protection and consumer interactions with AI products and services (Ipsos, 2023).

Figure V.1
Opinions on AI and personal data
(Share of respondents answering NO; percentage)



Source: UNCTAD calculations, based on Ipsos, 2023.
Note: Excludes countries for which the sample may not reflect the view of the average citizen.

Consumers lack trust about personal data protection

The survey shows that most respondents do not believe that companies using AI will protect their privacy. In Canada, France, Italy, Japan, Sweden and the United States, only 3 out of 10 respondents trust companies to make respectful use of their data. In addition, most respondents do not know which types of products and services make use of AI, exposing them to possible misuse. Some companies, for example, created databases by mining social media websites and the Internet for photographs without obtaining permission to index individuals' faces (Candelon et al., 2022).

In developing a set of internationally agreed principles for safeguarding consumer rights, an important reference point is the United Nations guidelines for consumer protection (UNCTAD, 2016). The guidelines can assist countries, particularly those with weaker institutions, in designing protection systems responsive to consumer needs and desires, favouring market differentiation and international cooperation.

A key concern related to consumer protection is the GenAI-driven creation of digital replicas, including deepfakes such as recreations of musical performances, impersonations of political and other public figures and the blending of real and artificial images to form disturbing images and explicit content. These pose risks to everyone, spreading misinformation and damaging reputations, and even undermining elections (United Nations, Secretary General, 2023). In a recent report, the United States Copyright Office identified the risks of digital replicas and the problems of privacy violation, unfair competition, consumer protection and potential fraud. Current legislation might not be well designed to address issues related to digital replicas.

Legislation should protect all individuals independent of their fame or commercial exposure, and tie liability to the making or distribution of unauthorized digital replicas (United States, Copyright Office, 2024).

Protecting intellectual property

The use of AI is also introducing new uncertainties with regard to the protection of intellectual property. It is not always clear how AI-assisted or AI-generated inventions should be treated under current intellectual property law (Cuntz et al., 2024). In general, AI algorithms themselves cannot be patented unless they take the form of software and only then in a few jurisdictions such as the United States. However, due to the statistical nature of AI, which relies on probabilistic models, the issue of how patents for computer software apply in this case has not yet been settled (WIPO, 2024). In most jurisdictions, patent protection can apply only to applications that amount to new inventions and are connected to some technological device, such as control systems for autonomous driving.

Regarding AI-generated inventions, the Supreme Court of the United Kingdom ruled in 2021 that AI cannot be named as a patent inventor because a machine cannot hold (and transmit) property rights and has not devised any relevant invention (United Kingdom, The Supreme Court, 2021). Similar conclusions have been reached by the United States Patent and Trademark Office and the European Patent Office.[1] A notable exception is in South Africa, where a patent naming an AI system as inventor was granted in 2021 (IPWatchdog, 2021).[2]

[1] In their efforts to harmonize and improve the efficiency of patent examination processes worldwide, the main intellectual property offices worldwide established a task force that recognized the need for dedicated guidance on examination practices related to new emerging technologies and AI (see https://www.fiveipoffices.org/node/9181).

[2] The same patent was not granted at the European Patent Office, at the UK Intellectual Property Office and at the United States Patent and Trademark Office.

Another challenge for intellectual property policy is how to balance the need to train AI models with real-world data while protecting existing copyrights.

In many instances, it is not clear whether training data fall under current exceptions to copyright protection. On these and other issues, it is important to ensure clarity, coherence and consistency.

C. AI governance initiatives from international forums

A fragmented political process

Recent multilateral forums have created a variety of initiatives and frameworks, including the following:

- ***OECD*** – In 2019, OECD approved the Recommendation of the Council on Artificial Intelligence, setting the first intergovernmental standards to foster innovation and trust in AI.
- ***Group of 20 (G20)*** – In 2019, the G20 AI principles called for AI stakeholders to ensure accountability and beneficial outcomes for people and the planet.
- ***Global Partnership on AI*** – In 2023, a ministerial declaration by the Global Partnership on AI underscored the need for ethical considerations to be woven into AI.
- ***Group of Seven (G7)*** – In 2023, the G7 launched the Hiroshima Process, defining a risk-based code of conduct for advanced AI systems but leaving different jurisdictions to choose their own approaches.
- ***AI Safety Summit*** – The Bletchley Declaration in 2023 called for reinforced cooperation for risk-based policies.
- ***AI Seoul Summit*** – In 2024, the Seoul Declaration highlighted potential risks posed by advanced AI and proposed the creation of an international network of AI safety institutes.
- ***Council of Europe*** – In 2024, the Council of Europe issued the first international legally binding treaty in the field of AI, namely, The Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law.[3]

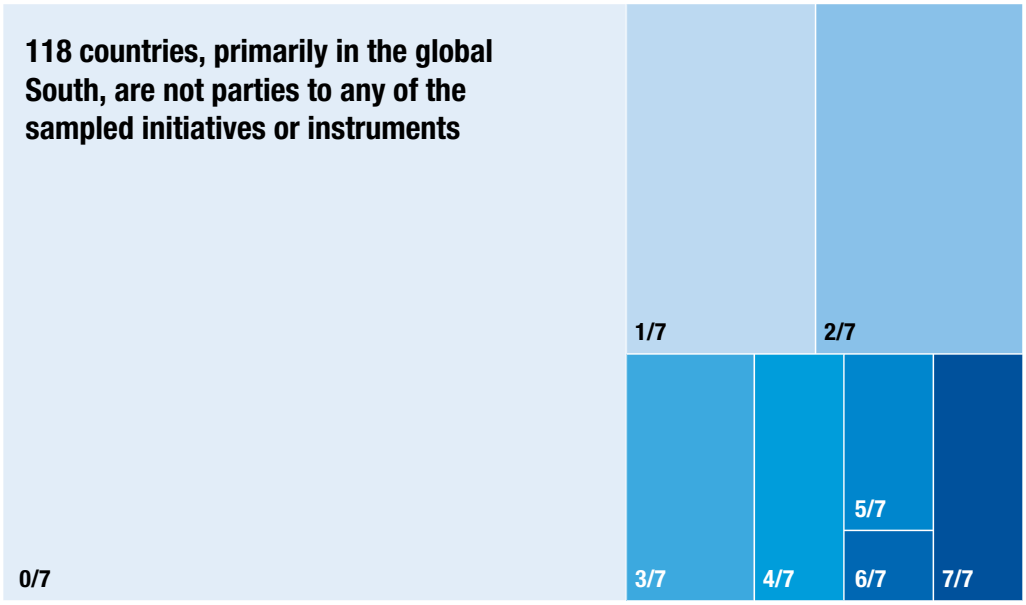
However, none of these initiatives can be considered comprehensive. Figure V.2 shows that these seven major international initiatives are largely driven by members of the G7, whereas 118 countries, mostly from the Global South, are party to none (United Nations, AI Advisory Body, 2024). Existing international initiatives may lack coordination or alignment, risking gaps and incompatibilities that could lead to a patchwork of fragmented regimes worldwide.

Many countries in the Global South provide essential services and resources fundamental to the functioning of AI systems, from content moderation to rare-earth metals (UNCTAD, 2024b), yet they have limited representation with regard to AI governance. Their absence may prevent governance frameworks from effectively addressing key challenges and priorities in developing countries, such as environmental degradation from AI-related mining and poor labour conditions in AI hardware manufacturing and the AI life cycle (see chapter II), as well as the socioeconomic impacts of AI-driven data work in vulnerable areas.

The under-representation of developing countries in international initiatives may **result in a failure of global AI governance**

[3] The following signed the convention in September 2024: Andorra; Georgia; Iceland; Israel; Norway; Republic of Moldova; San Marino; United Kingdom; United States; and European Union, on behalf of the 27 member States.

Figure V.2
International AI governance initiatives are largely driven by G7 members
Country involvement, from 0 to 7 initiatives
(Box size proportional to number of countries in each category)



Source: UNCTAD, based on United Nations, High-Level Advisory Body on Artificial Intelligence, 2024.
Note: The following initiatives are considered: OECD AI Principles, 2019; G20 AI principles, 2019; Council of Europe AI Convention drafting group, 2022–2024; Global Partnership on AI Ministerial Declaration, 2022; G7 Leaders' Statement on the Hiroshima AI Process, 2023; Bletchley Declaration, 2023; and Seoul Ministerial Statement for advancing AI safety, innovation and inclusivity, 2024.

Global AI governance should involve more inclusive engagement with the Global South and with marginalized and vulnerable communities, who have largely been excluded despite the significant impact on their lives (United Nations, 2020).

Emerging common principles

The evolution of the seven major international AI governance initiatives reveals a notable shift in approach from one based on principles to one based on risks (table V.1).

This has been accompanied by calls for industry stakeholders to guarantee the development of safe and trustworthy AI systems, paying greater attention to transparency and accountability along the AI life cycle. Box V.1 discusses the shift of approaches to AI regulation, from outlining principles to addressing the risks.

Table V.1
Summary of the seven major international AI governance initiatives

Initative	Description	Focus	Specificity
OECD AI Principles (2019)	Offers foundation for international cooperation and interoperability for accountable AI systems.	AI that maximizes benefits and minimizes risks for economic growth and sustainability.	Inclusive growth, human-centred values, transparency, security, safety and accountability.
G20 AI Principles (2019)	Addresses interface between trade and the digital economy. Calls for an evidence-based policy approach.	Principles for responsible stewardship of trustworthy AI. Reference to need for national policies and international cooperation.	Accountability and inclusive and safe digitalization (follows up on OECD recommendation on AI).
Global Partnership on AI (2020)	Integrated partnership focusing on responsible development of AI with respect for human rights.	Expert collaboration on research and pilot projects on responsible AI, data governance, future of work, innovation and commercialization.	Human rights and democratic values fostering international cooperation (integrated partnership with OECD).
Hiroshima AI Process Friends Group (2023)	Aims to promote safe, secure and trustworthy AI systems for all actors, including emerging economies, the private sector and academia.	Actions and principles calling for a risk-based approach, but leaving different jurisdictions to choose own forms of implementation.	Considers AI life cycle, aiming for safe, trustworthy and secure AI in line with risk-based approach (formed after G7 Summit).
Bletchley Declaration on AI Safety (2023)	Establishes shared responsibility for risks and opportunities of frontier AI.	Cooperation calling for actions to identify AI safety risks and build respective risk-based policies.	Considers need for cross-country policies and to develop relevant capabilities to mitigate potential risks of frontier AI.
Seoul Declaration (2024)	Recognizes risks posed by AI and calls for international cooperation for inclusive and safe AI.	Pointing to risk-based approaches to ensure safe, secure and trustworthy design, development, deployment and use of AI.	Prioritizes international cooperation to address risks posed by AI and a human-centred vision (follows up on Bletchley Declaration).
Council of Europe Committee on AI (2024)	First legally binding international treaty on AI, covering life cycle of AI systems.	Standards for a human-centred approach through human rights, democracy and rule of law impact assessment methodology.	Human rights, transparency and democratic values in life cycle of AI, stakeholder engagement and responsible innovation based on a risk-based approach (life cycle as under Hiroshima Process).

Source: UNCTAD.

Box V.1
Different approaches to AI regulation

AI regulation seeks to balance innovation, ethical considerations and safety. This is an evolving field, and different countries are exploring or implementing regulations that reflect their diverse cultural, legal and political contexts. There are three common approaches, as follows:

Principles-based

A notable example is the set of OECD AI Principles adopted in 2019. Such principles offer flexibility and adaptability, based on broad guidelines that evolve with technological change. However, this approach has notable drawbacks. It is voluntary, which can lead to inconsistent adherence and a lack of accountability, and organizations may selectively follow or ignore the principles, prioritizing profits over ethics, potentially causing harm. Additionally, broad principles often lack the specificity needed in addressing complex technical and legal challenges such as privacy breaches, bias in AI algorithms and accountability in autonomous systems.

To address these issues, regulatory frameworks need to be more precise. A possible solution is a comprehensive licencing regime that spans the entire AI life cycle, from hardware acquisition to model development and deployment. Entities would need to obtain licences at different stages, ensuring compliance with dedicated standards aimed at mitigating risks. By enforcing clear, preventive compliance rules, such a licencing system could help manage AI-related risks, safeguard public interests and build trust in AI technologies.

Risk-based

AI systems often function as black boxes with little indication of what is taking place inside. A risk-based approach identifies and mitigates potential harms before these technologies are deployed. In 2019, the Beijing Academy of Artificial Intelligence issued the Beijing AI Principles, calling for continuous improvements in AI systems in terms of maturity, reliability and controllability. Similarly, the European Union AI Act classifies AI applications by levels of risk, namely, unacceptable, high, limited and minimal. High-risk applications, such as biometric identification, involve strict regulations aimed at preventing harm before applications reach the market.

The risk-based approach addresses the complexity and unpredictability of AI systems. With the use of pre-emptive regulation, companies can only deploy AI systems that meet compliance standards. Such regulation eases the burdens on low-risk AI while applying strict oversight to high-risk applications. Additionally, it encourages safety and ethics from the outset, reducing collective harms. However, this approach also has limitations. Categorizing AI technologies can be highly subjective and challenging, particularly self-modifying AI systems that evolve over time. While this approach aims to prevent harm, it lacks provisions for corrective justice, meaning that affected individuals seeking compensation may need supplementary liability frameworks.

Liability-based

The emerging liability-based approach to AI governance creates legal avenues for individuals to seek compensation for AI-related harms, promoting fairness and predictability by applying uniform rules and standards. By holding developers and deployers accountable for their AI systems, this approach encourages companies to prioritize safety, reliability and ethics from the outset. This can ensure more trustworthy and robust AI, benefiting both consumers and society. However, this might slow innovation if AI companies, concerned about legal repercussions from, for example, unintended misuse of their AI models, become overly cautious.

In the United States, in 2024, the Senate of California passed the Safe and Secure Innovation for Frontier Artificial Intelligence Models Act. Among other requirements, the act mandated developers to fulfil several obligations prior to model training, including a separate, written safety and security protocol and the capability to promptly enact a full shutdown. However, the act was vetoed by the Governor as not being "informed by an empirical trajectory analysis of AI systems and capabilities" and because it focused only on the most expensive and large-scale models.

Source: Beijing Academy of Artificial Intelligence, 2019; Botero Arcila, 2024; California, Senate, 2024; California, Office of the Governor, 2024; Carpenter and Ezell, 2024; Li, 2024; OECD, 2024.

D. The United Nations contribution to AI governance

The Pact for the Future highlights the importance of **international cooperation in harnessing the benefits of STI**

Over the years, the United Nations has made a significant contribution to the global discourse on AI governance (figure V.3). For example, since 2017, ITU has organized sessions of the AI for Good Global Summit, a key platform that identifies AI applications to advance on the Sustainable Development Goals and scale such applications for global impacts. Other important United Nations-based platforms for advancing understanding on science and technology are the Commission on Science and Technology for Development (CSTD) and the Multi-stakeholder Forum on Science, Technology and Innovation for the Sustainable Development Goals (STI Forum).

In 2021, member States adopted the first global standard on AI ethics. The UNESCO Recommendation on the Ethics of Artificial Intelligence provides a shared framework of values, principles and actions for shaping legislation and policies (UNESCO, 2022).

A key policy area is gender, including to protect girls and women and ensure that AI systems do not violate their human rights or fundamental freedoms; the recommendation also calls for investment in girls' and women's participation in STEM and ICT disciplines, to improve their employability and help ensure equal career development. The recommendation is accompanied by a readiness assessment methodology that helps countries measure their preparedness for applying AI and an ethical impact assessment for evaluating the benefits and risks of AI systems (UNESCO, 2023).

In 2024, the United Nations General Assembly adopted two resolutions, one on seizing the opportunities of safe, secure and trustworthy AI systems for sustainable development (United Nations General Assembly, 2024a) and one on enhancing international cooperation on capacity-building of AI (United Nations General Assembly, 2024b).

Figure V.3
Key United Nations efforts in global AI governance

Source: UNCTAD.

The resolutions serve to help strengthen international and multi-stakeholder collaboration and support the effective, equitable and meaningful participation of developing countries.

In September 2024, United Nations Member States adopted the Pact for the Future. This highlights the importance of international cooperation in harnessing STI while bridging the growing divide within and between countries. This was accompanied by a Global Digital Compact that sets a series of commitments for enhancing international AI governance for the benefit of humanity (United Nations General Assembly, 2024c).[4]

The development of AI is intrinsically connected to the collection, processing, storage and use of digital data. The CSTD has been requested to establish a dedicated working group to engage in a comprehensive and inclusive multi-stakeholder dialogue on data governance at all levels as relevant for development, which will report on its progress to the General Assembly in 2026. The group will consider equitable and interoperable data governance arrangements, such as fundamental principles of data governance for development, proposals to support interoperability between national, regional and international data systems, with considerations of sharing the benefits of data and options to facilitate safe, secure and trusted data flows (United Nations General Assembly, 2024c).

Following on the recommendations of the High-Level Advisory Body on Artificial Intelligence, in the Global Digital Compact, Member States committed to the establishment of a multidisciplinary Independent International Scientific Panel on AI and a Global Dialogue on AI Governance. These initiatives aim to promote reliable scientific AI understanding through evidence-based impact, risk and opportunity assessments. By sharing best practices, they also support interoperability and compatible approaches to AI governance.

Other United Nations agencies and bodies have been leveraging AI for the Sustainable Development Goals, as well as informing and shaping global AI governance. For example, UNESCO has developed Guidance for Generative AI in Education and Research, UNICEF has developed Policy Guidance on AI for Children and WHO has developed Guidance on the Ethics and Governance of Artificial Intelligence for Health.

In coordinating efforts across various domains, international law offers a shared normative foundation that can support coherent global AI governance and avoid the proliferation of fragmented initiatives and institutions.

International law can provide a foundation in coordinating AI-related efforts across different domains

E. Ensuring accountability

All players in the AI life cycle should have well-defined roles, namely, developers need to ensure the fairness and safety of their systems and users need to ensure ethical AI deployment.

All should be accountable, through frameworks that define responsibilities, foster transparency and ensure responsible use.

[4] During the intergovernmental process of the Global Digital Compact, several thematic deep-dive consultations were conducted to discuss priorities and key issues, one of which focused on AI and other emerging technologies and centred on harmonizing institutional coherence and the importance of aligning digital transformation strategies, data governance and cybersecurity frameworks.

Public disclosure is essential to improve transparency and accountability

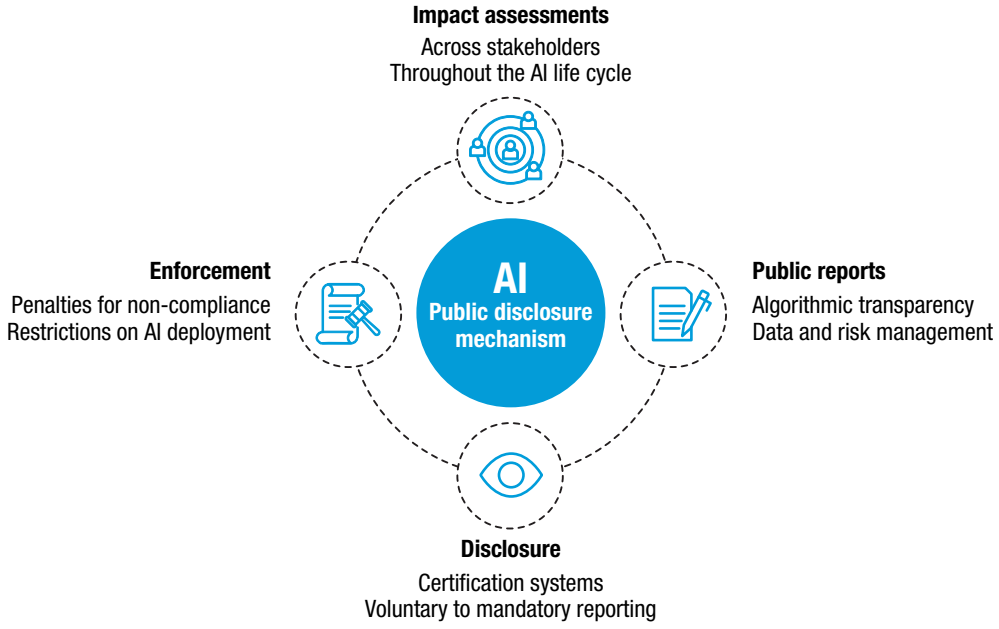
Given the growing influence of technology giants, companies, particularly those deploying large-scale AI systems, should be required to make public disclosures of their activities. This would help anticipate and address potential impacts of AI, increase systemic resilience and enhance transparency and accountability.

One possible model is the ESG framework. An AI equivalent could involve impact assessments across stakeholders throughout the AI life cycle, measuring the effects on the environment, employment, human rights, safety and inclusivity (figure V.4). Companies can use international guidelines and standards as a basis for impact assessments. Carried out before and after deployment, these can shed light on how AI systems affect jobs, wages and working conditions, for example, and ensure that companies have mitigation strategies to support workers.[5]

Public disclosure measures should also detail how AI systems work, including algorithmic decision-making processes; the collection, use and management of data; and efforts to ensure fairness and accountability. Auditing impact assessments and public reports helps ensure compliance with established guidelines, identify potential risks and certify that AI systems meet standards for fairness, transparency and safety.

The evolution of ESG reporting provides valuable lessons for engaging the private sector in developing AI accountability mechanisms. A certification system can attest that a company meets AI-related ethical and transparency criteria. Once the standards are well developed with clear reporting frameworks and regulations, reporting can become mandatory to ensure comprehensive, standardized and transparent disclosures.

Figure V.4
Establishing an AI public disclosure mechanism to ensure accountability



Source: UNCTAD.

[5] An example is the guidelines for AI and shared prosperity developed by the Partnership on AI that include a job impact assessment tool, responsible practices and other resources, https://partnershiponai.org/paper/shared-prosperity/.

At present, many stock exchanges mandate ESG reporting or require listed companies to provide explanations if they are unable to comply; the "comply or explain" approach. Mandatory reporting for AI can be supported by similar oversight measures. For enterprises that fail to comply with established standards and regulations, fines may be imposed or restrictions set on the deployment of particular AI systems.

Public disclosure of AI systems should:

Balance innovation and safety – Policymakers need to strike a balance between fostering innovation and ensuring public safety and trust. Overregulation may hinder technological progress, while underregulation could pose significant risks and make it difficult to hold companies accountable. It is also important to consider the regulatory burden on SMEs. Larger firms may find it easier to meet stringent AI regulations, since they have the resources to manage legal risks and deal with complex regulatory requirements (Kretschmer et al., 2023). In contrast, SMEs may lack the skills or resources required to achieve compliance, potentially diverting funds from innovation and making them less competitive. SMEs may therefore need support, particularly in developing countries, where AI ecosystems are less developed.

Incorporate flexibility – The requirements should be flexible and capable of adapting to rapidly evolving technologies. Regulations need to be regularly updated to address emerging ethical dilemmas and incorporate technological breakthroughs and unforeseen impacts that appear with the diffusion of AI.

Involve different stakeholders – Policies and requirements need to reflect diverse perspectives, interests and expertise; it is therefore important to take a multi-stakeholder approach, involving the private sector, civil society and academia. Particular attention should be given to vulnerable populations, who are less likely to benefit from AI advances but more likely to experience AI-related harms. For example, AI can exacerbate existing gender inequality and amplify biases. It is also critical to encourage workers to participate in the design and implementation of AI systems, guaranteeing that new AI tools complement their work and are aligned with their needs and interests.

To ensure fairness and positive outcomes across societies and jurisdictions, existing platforms, such as the AI for Good Global Summit, the CSTD, the STI Forum and Global Dialogue on AI Governance, can serve as venues to discuss common AI public disclosure requirements and accountability in AI governance. These platforms can also help strengthen data governance cooperation at all levels and unlock the full potential of digital and emerging technologies.

F. International cooperation for infrastructure, data and skills

Harnessing the benefits of AI inclusively requires international actions at each of the three leverage points of infrastructure, data and skills. International collaboration can enable countries to develop consistent approaches and actions, as well as pool resources and expertise for directing AI development towards the benefit of humanity. Such collaboration is critical in order to avoid fragmentation, duplication of efforts and the risks of AI use amplifying inequality across borders.

For effective global collaboration on infrastructure, data and skills, the following sections outline three propositions,

namely, digital public infrastructure, open innovation and capacity-building and research collaboration.

Developing digital public infrastructure for AI

To address the increasing demands for connectivity and computing power, DPI models can offer an equitable approach to provide the necessary access and services to stakeholders of the AI ecosystem.

A modular approach allows digital public infrastructure to be tailored to particular AI needs

DPI is a set of shared, secure and interoperable digital systems and applications that can be used flexibly in different activities and sectors. It can be built on open standards to provide societies with equitable access to public and private services (G20, 2023a). DPI connects people, businesses and Governments through secure and reliable online systems, and it is often referred to as the infrastructure of the digital era.

Building on foundational physical infrastructure, such as networks, data centres and storage systems, DPI offers a shared means to many ends, including e-government services, digital identity systems and digital payment systems. There are many successful experiences across countries. For example, in Estonia, a DPI platform facilitated the secure exchange of data across consumers, energy distributors and producers, to enhance decision-making in the energy sector. In India, a DPI approach led the way for identification provision to over 1 billion people. In Togo, during the pandemic, social assistance to about 450,000 people was distributed within one week through a DPI platform (UNDP, 2023a).

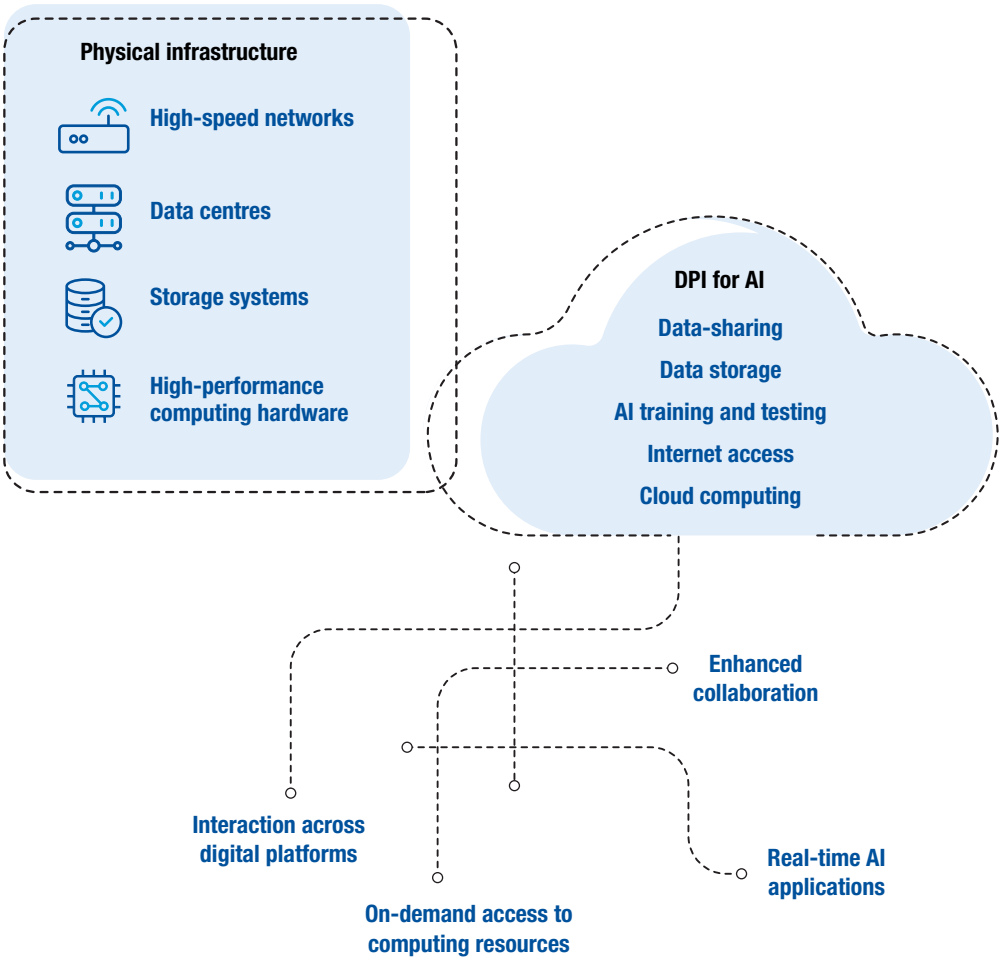
It is estimated that low- and middle-income countries can achieve the equivalent of two to three years of growth by implementing DPI in the financial sector. In the climate sector, DPI is expected to bring benefits to carbon offsetting and trading, accelerating emissions control efforts by 5–10 years (UNDP, 2023a). The Secretary-General has selected DPI as one of the high-impact initiatives that can accelerate progress on achieving the Sustainable Development Goals.

Developing countries can provide resources to build flexible DPI systems and support AI adoption and development. For example, Governments, alone or with private partners, can establish high-speed networks for reliable, fast Internet access, enabling data transfer and real-time AI applications. Data centres can ensure secure, efficient storage and easy access to information, and support platforms such as cloud services and government databases for seamless data exchanges. Interoperable frameworks can unlock data exchanges and open data platforms, enhancing the use of AI models across sectors. Combining high-speed networks and data centres, high-performance computing provides scalable computing power for AI training, applications and data management. These modular components can address particular challenges and needs in developing countries, offering resources that can enable collaboration, innovation and responsible AI deployment at scale (figure V.5).

Despite the potential of DPI for AI, developing countries face significant challenges in its design and implementation. The international community can support developing countries by providing a combination of guidelines and principles,[6] financial resources and technical expertise. In 2023, for example, the G20 Digital Economy Ministers reached a consensus on how to leverage DPI for digital inclusion and innovation. The framework includes a list of key components and principles (G20, 2023a), as well as a playbook with practical guidelines and a design checklist (UNDP, 2023b). In addition, to address the existing knowledge gaps in practices for designing, building and deploying population-scale DPI, the G20 has created a Global Digital Public Infrastructure Repository (G20, 2023b).

[6] For instance, DPI governance that encompasses regulatory frameworks and data governance is key to ensure secure and inclusive implementation and safeguard data sovereignty, protection and security.

Figure V.5
Developing digital public infrastructure for AI



Source: UNCTAD.

Other international programmes and initiatives are emerging, including the following:

- ***The United Nations High Impact Initiative on DPI*** – Aimed at unlocking targeted support for DPI in 100 countries by 2030 (ITU, 2023).
- ***Identification for Development and Digitizing Government-to-Person Payments*** – These World Bank initiatives aim to help over 60 countries issue digital identification to 550 million people (World Bank, 2023).
- ***The Universal Safeguards for DPI initiative*** – Launched in 2023 by the Office of the Secretary-General's Envoy on Technology and UNDP, this initiative is aimed at co-creating a pragmatic framework designed to mitigate risks, advance on the Sustainable Development Goals and foster trust and equity (Universal DPI Safeguards, 2023).
- ***The 50-in-5 campaign*** – Aimed at helping 50 countries design, launch and scale components for open, secure and resilient DPI within five years (50 in 5, 2024).

- ***The Global Digital Compact*** – The Compact represents the latest landmark, with countries committed to increasing investment and funding towards the development of DPI to advance solutions for the Sustainable Development Goals (United Nations General Assembly, 2024c).

Efforts from the international community can help scale up and tailor DPIs for AI, providing developing countries with the foundational systems needed for digital inclusion and technological innovation. The international community could provide developing countries with financial support or access to existing DPIs (Gottschalk, 2019).

DPI for AI can rely on two service models that, compared with traditional infrastructure, provide greater flexibility, scalability and global accessibility. The first is infrastructure as a service, which provides virtualized computing resources on the cloud on an as-needed basis, including servers, storage and networking. The second is data as a service, which provides data on demand, through application programming interfaces, or cloud-based platforms, enabling users to access, manage and analyse data sets without owning the underlying infrastructure. Cloud and data resources from infrastructure as a service and data as a service providers can be leveraged to develop packaged, cloud deployable and interoperable AI services.

Infrastructure as a service and data as a service are mainly owned and operated by private companies on a commercial basis. However, governments can collaborate with these companies to offer services within the local AI ecosystem.

A CERN for AI model can provide equitable access to AI infrastructure

Public-private partnerships can expedite the development of DPI for AI. To increase their collective negotiating power and strike equitable terms, developing countries could pool resources through regional or multi-country partnerships. In addition, multi-stakeholder collaborations could foster innovation in the digital ecosystem and facilitate the exchange of best practices (UNDP, 2023b). These partnerships can also help set international standards, governance principles and regulatory frameworks, to foster an inclusive and sustainable AI development and adoption framework.

DPI for AI services requires high-performance computing hardware, data centres and other complex and expensive physical infrastructure that few individual institutions or countries can afford. To provide affordable and distributed AI infrastructure, one model is that of CERN, the intergovernmental organization that operates the world's largest particle physics laboratory, including the Large Hadron Collider, in France and Switzerland. This shared resource is used by researchers globally. A CERN for AI model can be based on the principles of international cooperation, open science, open access and the pooling of resources and expertise.[7]

A similar shared facility for AI research and development would enable countries and organizations to engage in cutting-edge research, counterbalancing the power of technology giants and promoting equitable access to AI resources.[8] Compared to the Large Hadron Collider, computational resources for AI can be more easily spatially distributed.

[7] CERN not only provides a unique range of particle accelerator facilities to researchers, but also trains new generations of physicists, engineers and technicians and engages all citizens in research and in the values of science. Its research in fundamental physics helps uncover what the universe is made of and how it works, and at the same time introduces new solutions to different fields of work. For example, CERN collaborates with different institutions to create network platforms to foster AI research in medicine. One of their AI algorithms designed to diagnose anomalies in the CERN accelerator chain, has the potential to identify brain pathologies including strokes, see https://home.cern/news/news/knowledge-sharing/accelerating-stroke-prevention.

[8] For instance, the International Computation and AI Network aims to leverage experts' knowledge and broaden access to the world's foremost supercomputing resources to develop AI models that benefit society worldwide. It plans to be fully operational by early 2025, see https://www.icain.org/.

A shared AI infrastructure could be developed as a distributed public infrastructure across institutions and countries in multiple centres using high-speed networks, with system interoperability and security protocols.[9] A key element for success is the involvement and openness of various stakeholders, including Governments, businesses, academia and civil society, which could use the shared facility as a virtual space for interaction, experimentation and co-creation.

Promoting AI through open innovation

Open innovation provides a way of managing the innovation process and enabling collaboration and knowledge-sharing among independent innovators, companies, institutions and countries. Compared with the traditional model of innovation where each company relies on its own resources, open innovation encourages firms, public organizations and other actors to tap into the large pool of innovative resources available among external actors, including customers and citizens. Open innovation can speed up research and development, lower costs and enhance the quality or relevance of innovation outcomes,[10] which is particularly beneficial for developing countries and SMEs, to compensate for limited resources and skills.

Open innovation has gained significant traction in recent years and is widely recognized as a key driver of technological opportunities, enabling risk and cost-sharing and the championing of transparency while democratizing access to diverse, technically advanced resources. For example, through the Global Digital Compact, United Nations Member States have committed to developing safe and secure open-source software, open data, open AI models and open standards, also referred to as digital public goods (United Nations General Assembly, 2024c). Another important effort is the Manaus package issued under the Presidency of Brazil by the G20 Research and Innovation Working Group. This includes an open innovation strategy to foster international collaboration on STI, and puts forward principles, approaches and tools for inclusive and equitable open innovation initiatives (G20, 2024).

Concepts and approaches for open innovation are still evolving, but they generally involve open data, that is, making data freely available. This can facilitate the training and testing of AI models and foster innovation by allowing researchers and developers to experiment with data and create new AI solutions. Open data can also improve transparency and facilitate the assessment of new AI models and applications.

Prominent examples of open data initiatives include the Human Genome Project, the COVID-19 Open Research Data Set and the Human Connectome Project. Most emerging open data platforms for AI are from the private sector, such as the Kaggle data sets, the OpenAI data sets, the Microsoft Azure open data sets and the registry of open data on Amazon Web Services. They vary in their operation, data management approaches and open data standards. Common international definitions and standards for open data are essential to give both the public and private sectors access to high quality and diverse data and make them digital public goods. Further important aspects include privacy, security and the prevention of data misuse and misinterpretation.

Another important instrument is open source, largely diffused in software development.

[9] This is, for example, the current approach discussed within the European Union, where the Group of Chief Scientific Advisers has suggested the creation of a European Distributed Institute for AI in Science.

[10] For example, the European Commission characterizes the concept of open innovation as combining the power of ideas and knowledge from different actors to co-create new products and find solutions to societal needs, as well as creating shared economic and social value, including a citizen and user-centric approach (European Commission, 2016).

The use of open data and open-source systems can help **democratize knowledge and resources for AI innovation**

This is a model wherein the source code, design or blueprint of a software package or a project is made freely available through public platforms. Well-known open-source operating systems include Android and Linux, which power critical infrastructure and digital devices. By providing free and open tools, libraries and frameworks, the use of open source democratizes knowledge and resources, enables global collaboration and innovation and improves transparency and trust.

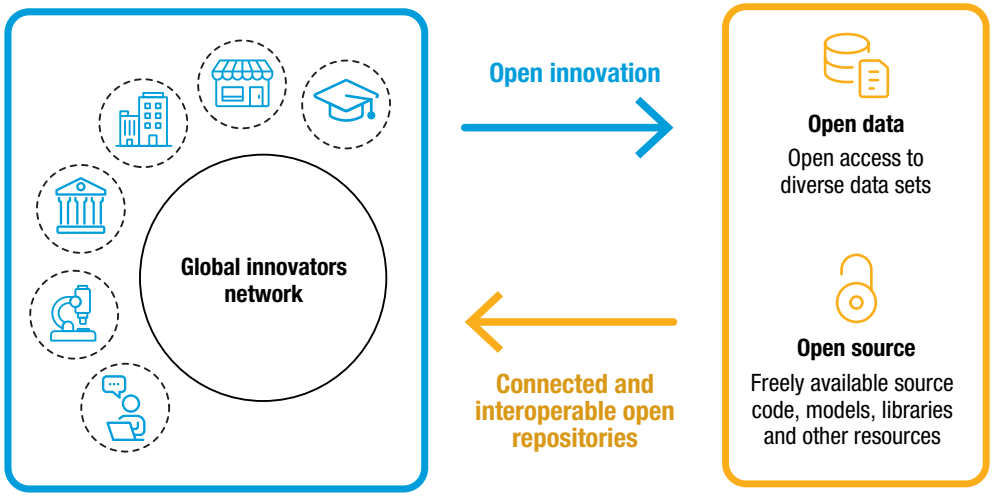
Since the emergence of GenAI, there has been a surge in open-source AI and GenAI projects. These include commercial large language models, as well as applications developed by academic institutions and individual developers (Daigle and GitHub staff, 2023). The code is communally maintained on open-source platforms such as GitHub and others, which offer diverse use cases and readily accessible AI models, with community engagement for discussion and mutual support.

The international community can benefit from coordinating and harmonizing the important but fragmented open AI resources worldwide. Successful open innovation for AI relies on connected and interoperable open repositories of global knowledge, using open data and open source in a global innovators network with standardized protocols. Such a repository can strengthen the global knowledge base, foster inclusiveness, improve access through trusted hubs that ensure quality and security, mitigate potential risks and accelerate AI-driven innovation (figure V.6).

Strengthening capacity-building and research collaboration

Both DPI and open innovation provide accessible resources for businesses, academia and the general public to engage in the adoption and development of AI.

Figure V.6
Open innovation in AI



Source: UNCTAD.

However, using these resources requires technical knowledge and skills, such as statistical knowledge, programming skills, familiarity with open-source platforms and protocols and knowledge of machine learning algorithms, as well as an understanding of the domain for which an application is to be used.

These capacities are often highly concentrated in technology companies and developed countries, an imbalance that the international community should address through the transfer of knowledge and technology to developing countries, as well as assistance for capacity-building.

The CSTD has been advancing international STI collaboration through knowledge and experience-sharing, and capacity-building. The Commission can further strengthen international AI collaboration by sharing good practices, facilitating coordination and contributing to enhanced trust, transparency and inclusivity.

Multi-stakeholder engagement and knowledge-sharing on AI, through international dialogues or global networks of exchange, for example, could build on existing platforms such as the CSTD, the STI Forum, the Internet Governance Forum and the AI for Good Global Summit. It is also important to have technical assistance and tailored solutions based on local needs and the limited absorptive capacities of many developing countries. This can help effective transfers of technical knowledge and reduce the risk of misuse due to a lack of resources or expertise.

Knowledge and technology transfer typically focus on particular information, skills or activities. Capacity-building is critical in adopting and developing rapidly evolving frontier technologies, and encompasses a broad set of capabilities that enable individuals or countries to innovate continuously. It can take place through training workshops that enable policymakers to develop STI policies or tailored educational programmes on AI and data literacy.

Capacity-building can also take place through AI incubators and research hubs and R&D partnerships. Special attention should be given to the adoption and development of human-complementary AI technologies. This can be achieved by allocating dedicated funding to AI solutions that augment rather than replace workers, and setting up international AI research networks or partnerships that prioritize human-centred AI.

These activities align with the resolution adopted by the General Assembly on enhancing international cooperation on capacity-building of artificial intelligence, particularly in developing countries, as well as the Global Digital Compact, which encourages the development of international partnerships on AI capacity-building.

To create global hubs for AI capacity-building or an AI-focused centre and network, a useful model and reference point is the United Nations Climate Technology Centre and Network. This is the implementation arm of the Technology Mechanism of the United Nations Framework Convention on Climate Change, which supports developing countries through technical assistance and access to information and knowledge on technologies, including capacity-building and policy advice, as well as fosters collaboration among stakeholders via its network of regional and sectoral experts. While the CERN model focuses on shared infrastructure, the Climate Technology Centre and Network approach is aimed at providing technical assistance to developing countries and building capacity through knowledge and technology transfer.

An AI-focused centre and network could help developing countries in adopting, adapting and developing AI. This could build on existing efforts such as the International Research Centre on Artificial Intelligence under UNESCO auspices, which promotes ethical AI solutions for the Sustainable Development Goals, and the Global Partnership on Artificial Intelligence, which advances the implementation of human-centric, safe, secure and trustworthy AI solutions.

An international AI centre can provide technical assistance, build capacity and foster collaboration

Reinforced South–South cooperation in AI can help address common challenges

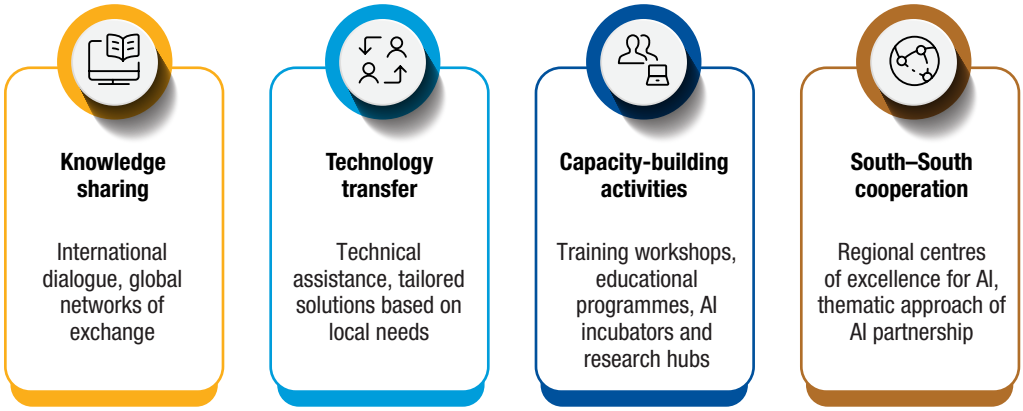
Furthermore, collaboration in AI research and innovation can help scale up South–South cooperation in science and technology to address common challenges (United Nations General Assembly, 2019). For this purpose, the more technologically advanced developing countries can collaborate with other countries, for example, through regional partnerships, to create critical mass in AI, favouring knowledge and technology transfer, and overcoming the resource constraints that may hamper the establishment of thriving AI ecosystems in less-endowed countries.

In recent years, there have been numerous instances of new South–South cooperation in the field of AI. The BRICS member countries, for example, have formed an AI study group aimed at catalysing AI innovation. China has expanded cooperation with Africa in various areas, including AI, as outlined in the Forum on China-Africa Cooperation Beijing Action Plan (China, Ministry of Foreign Affairs, 2024). In 2024, the launch of the ASEAN Committee on Science, Technology and Innovation Tracks on AI aimed at expanding regional capacity development initiatives in AI (ASEAN, 2024).

These initiatives represent promising starting points for South–South cooperation, and the Global South can also make use of other mechanisms for exchanging AI technologies, data and services. The Global South can, for example, incorporate provisions for AI technology and services in trade agreements and engage regional institutions such as the African Union or ASEAN for sharing best practices and developing coherent AI policies.

In addition, developing countries can build regional innovation hubs and expert networks for addressing AI challenges. In Africa, for instance, the Artificial Intelligence for Development programme scales AI innovations through the creation of four pan-African Innovation Research Networks and supports policy research by funding two research-to-policy and think-and-do tanks in East Africa and a policy network in West Africa. It also engages African talent and skills through two multidisciplinary university labs. Other ways in which countries in the Global South can work together are mobility programmes, human capital development initiatives and joint research and technical projects in the field of AI and other frontier technologies.

Figure V.7
AI capacity-building partnerships



Source: UNCTAD.

Countries can cooperate on particular themes or in sectors in which AI brings sustainable and scalable change. One of the most important areas is agriculture, for which a major resource is the Consultative Group on International Agricultural Research (CGIAR), the largest global partnership focusing on agricultural research for development, which can integrate AI as a tool to create and diffuse new solutions for climate-smart, innovative and socially inclusive agriculture, while addressing challenges such as crop disease and pest detection, yield prediction and precision irrigation. A thematic approach of AI partnership can help coordinate and target efforts in key areas that are most relevant to the socioeconomic and developmental needs of the Global South.

G. Guiding AI for shared prosperity

Technology does not have intrinsic moral or ethical qualities. Whether its impact is positive or negative depends on how humans develop and use it. At first glance, AI technologies are no different; their use can enhance various aspects of our lives, but can also deepen inequalities and further concentrate economic power (Korinek and Stiglitz, 2021). Nevertheless, AI is beginning to challenge the notion of technological neutrality. This is the first technology in history capable of making decisions and generating ideas by recombining existing knowledge, and which could evolve into an active agent. As AI grows faster and more powerful, the potential response times shorten and the room for error may become smaller (AI Action Summit, 2025).

History shows that technological progress brings economic growth but does not guarantee that the benefits will be broadly distributed, nor does it necessarily lead to inclusive and equitable human development. Driven forward by new technologies, markets may make efficient economic decisions in the short term, but do not assume responsibility for distributive consequences or automatically maximize social value.

Technological advances have typically fostered the rise of technology giants and favoured the owners of capital at the expense of labour, leading to greater concentration of wealth (Acemoglu and Restrepo, 2019; Korinek et al., 2021). There is an urgent need to guide AI advances.

Responsible design, conscientious use and ethical oversight of AI depends on effective global AI governance, along with international support for developing countries through DPI, open innovation and capacity-building. Equally important is building a common vision to guide AI progress towards promoting shared prosperity and fostering an inclusive economic future for all of humanity.

UNCTAD, in this report, calls for a shift of focus from technology to people, putting humans at the centre of AI development. AI technologies should complement rather than displace human workers, and the transformation of production processes should bring benefits that are shared fairly among countries, firms and workers. Inclusion and equity are central to an AI-for-all approach, supported by policies, incentives and regulations driven by a global agenda that promotes international multi-stakeholder collaboration.

Humans should be at the centre of AI development

Inclusion and equity should be at the forefront of AI for all

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