Addendum on AI and Digital Government

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A.1 Introduction

The integration of artificial intelligence (AI) in public administration has attracted global attention in recent years. It is widely accepted that AI technologies can improve public sector operations by replacing administrative tasks with automated processes, improving efficiency, and eliminating backlogs and redundancies. This shift is not without risks, however; the lack of careful scrutiny of AI advances during the past decade and the limited understanding of the nature and extent of their consequences have raised red flags in many countries, leading to what is sometimes referred to as the "AI regulation race". Because the development of powerful AI technologies such as large language models (LLMs) outpaces the development of national policies and regulatory frameworks, AI has become a focal point in discussions on digital transformation in the public sector.

In March 2024, the United Nations adopted resolution A/RES/78/265,[1] underscoring the potential of AI to support or hinder the achievement of the 17 Sustainable Development Goals (SDGs). Followed by the resolution A/RES/78/311, which explores ways to enhance international cooperation on capacity-building for using and managing artificial intelligence. Furthermore, AI has been a key issue of discussion in multiple UN committees and working groups, including the global digital compact by the General Assembly as part of the Pact for the Future. At the national level, many leading countries, including Canada, China, the members of the European Union, the Republic of Korea, Singapore, and the United States of America, are actively pioneering the regulation and use of AI.

This addendum to the *2024 E-Government Survey* focuses on the integration of AI in the public domain and digital government. While this is a specific and narrower aspect compared to the broader discussions on AI regulation and governance in general, it remains a crucial venue for review. Furthermore, this addendum aims to explore the integration of AI in the public domain, which is impacted by the much broader discussion on the regulatory frameworks aimed at benefiting society. The addendum provides a short summary of the perceived opportunities and challenges associated with AI technology, specifically in the public sector, followed by an overview of national, regional, and global efforts to regulate AI. It highlights the benefits of using regulatory sandboxes (a framework that allows being exempted from specific regulations to test a new product/process) in the development of regulatory frameworks, showcasing a number of successful initiatives in this area.

The addendum offers examples of existing global and national regulatory frameworks and agendas, providing recommendations on how to maximize the benefits while minimizing the negative effects of AI implementation in the public sector. A section highlighting methodologies and successful cases of AI capacity-building, including expanding AI literacy, is included to promote the inclusive development of AI technologies.

A.2 AI in the public sector: opportunities and challenges

A.2.1 Opportunities

AI is recognized as an effective tool for enhancing work efficiency and productivity. It can be used for a multitude of purposes, including detecting defects, classifying data, and making recommendations.[2,3,4] There are numerous examples of AI use for products and services in both the public sector and the private sector, though the latter has been particularly active and innovative in AI integration.

The advantages and opportunities associated with AI extend beyond the private sector; AI integration in the public sector can also deliver enormous benefits. AI has proven instrumental in effective public service delivery during crises such as the COVID-19 pandemic. In Togo, for example, the social protection programme Novissi utilized satellite imagery and household consumption data to identify the poorest villages.[5] These villages were then prioritized using machine learning algorithms and mobile phone data to effectively distribute $22 million through three monthly mobile phone payments to 600,000 citizens in urban areas.[6] Other examples include the "virtual doctor" self-assessment tool powered by AI in Croatia and the use of sensors and AI algorithms in London to control traffic. These are excellent examples of how AI can contribute to addressing society's problems.[7]

AI technologies can also support the achievement of the SDGs. The global community has been reminded time and again that the world is not on track to meet the Goals articulated in the 2030 Agenda for Sustainable Development. A comprehensive midpoint assessment of the 135 trackable SDG targets was conducted for The Sustainable Development Goals Report 2024, and the findings revealed only moderate or marginal progress for almost half the targets and either no progress or regression for 35 per cent of the targets since 2015.

The urgent call to action to accelerate progress towards the SDGs comes at a particularly challenging time, as the global economy is still reeling from the effects of the pandemic, with only a few countries having experienced substantial recovery. For most countries, there is a pressing need for enhanced efficiency with constrained budgets – a challenge ideally suited for AI algorithms. There are numerous instances where Governments have leveraged AI to enhance efficiency across various sectors. The Singapore government, for example, implemented AI in its service moments of life (now called Life SG) to streamline government services, including birth registration and elder care. The Indian government has implemented AI technologies into the agriculture sector, improving the value chain for more than seven thousand chili producers. Specifically, the 'Saagu Baagu' pilot project developed in cooperation between the World Economic Forum and the Telangana state government has benefitted participating farmers with a 21 per cent increase in chili yields per acre, a 9 per cent reduction in pesticide use, a 5 per cent decrease in fertilizer usage, and an 8 per cent improvement in unit prices due to quality enhancements.[8]

A.2.2 Challenges

While the potential benefits of AI technologies are substantial, so are the potential risks. The ethical, security and social implications of AI must be carefully addressed. One ethical concern is data bias. AI algorithms are intrinsically data-based, meaning they rely heavily on accumulated data to produce results. Consequently, any bias in these data can lead to the misrepresentation or underrepresentation

of certain groups. This bias is especially problematic when Governments employ AI in the development of public policies intended to serve the entire population, including marginalized groups. The persistent digital divide highlighted in previous United Nations E-Government Surveys[9,10] and digital governance studies poses a substantial challenge to implementing AI technologies in the public sector, especially in middle-income, low-income and least developed countries.

Chapter 4 of the *2022 E-Government Survey and chapter 3 of the 2024 E-Government Survey* provide extensive insight into digital disparities within and between countries. According to both Surveys, significant progress has been achieved in bridging the digital divide. As noted in chapter 3 of the present Survey, the proportion of the population without digital access has declined from 45 per cent (3.5 billion) to just over 22 per cent (1.73 billion) in recent years. However, these gains derive primarily from developments in Asia; Africa, Oceania and the Americas have seen little to no narrowing of the digital divide. Data disparities are particularly problematic when AI technologies are applied in critical areas such as health care. In the 2021 publication *Ethics and Governance of Artificial Intelligence for Health: WHO Guidance*, inclusiveness and equity are identified as key ethical principles for AI use in health care. The publication further emphasizes the need for careful monitoring and evaluation of AI technologies to avoid disproportionate impacts on specific groups.[11]

Moreover, the growing influence of AI technologies in the labor market signals a profound transformation and the potential risk of job displacement across various sectors. This necessitates the implementation of strong universal social protection systems to support those adversely affected by these rapid changes and facilitate smoother transitions to alternative forms of employment. Such measures should include unemployment benefits coupled with active labor market policies aimed at retraining displaced workers.

A.3 AI governance and regulatory frameworks

With the advent of LLMs and other powerful AI systems, the AI discourse has shifted from empowerment to regulation. The rapid evolution of AI technologies has outpaced the regulatory capacities of Governments; however, national and international authorities are aware of this dynamic and are taking steps to address the gap. Many United Nations member States have established different types of institutions to oversee the development and regulation of AI technologies and safeguard citizens against potential risks and threats.

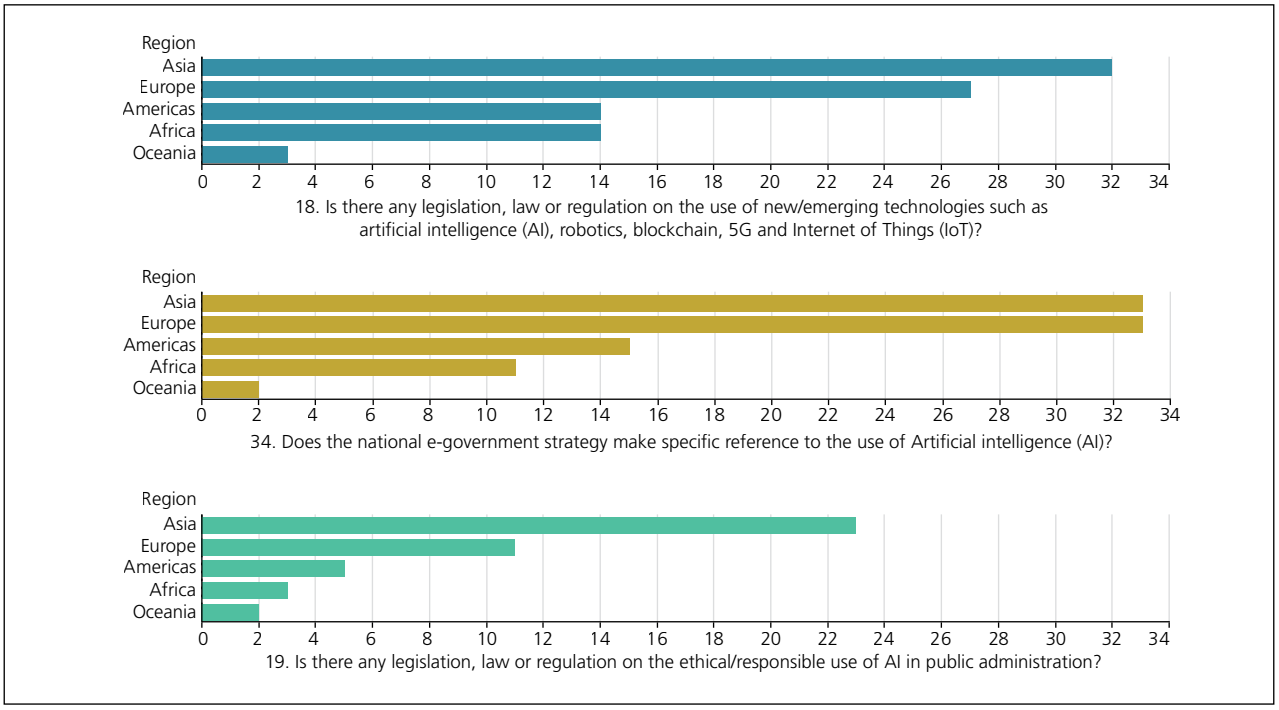
The past several Surveys have endeavored to capture this transition and explore the evolving landscape of AI utilization and regulation by eliciting feedback on specific questions. Responses to the Member States Questionnaire (MSQ) disseminated by UN DESA indicate that 63 per cent (90 out of 142) of the countries surveyed for the 2022 to 2024 editions report having legislation or regulations on the use of new/emerging technologies such as AI, robotics, blockchain, 5G, and the Internet of Things. Almost half (44 out of 93) of the countries responding have already adopted legislation or regulations on the ethical/responsible use of AI in public administration. While these figures are notable, given that the discourse on the regulation of AI is relatively new, they remain well below the 88 per cent of countries (121 of 137) that have established e-government strategies or the equivalent. This disparity underscores the need for accelerated efforts to establish AI regulatory frameworks at the national level.

In response to the question "Does the national e-government strategy make specific reference to the use of artificial intelligence (AI)?", a total of 94 countries from among the 2022 and 2024 respondents indicate that their national e-government strategies include explicit reference to AI, an increase from 65 countries in 2020. While this represents solid progress, it also points to the absence of AI provisions in many national e-government strategies. Countries that have not yet integrated

AI into their digital agendas should carefully consider doing so to assess the potential benefits and challenges the technology may bring, as AI can greatly enhance governance and service delivery.

MSQ responses on the regulation of AI technologies reveal a regional imbalance. Asia is the leading region, ranking first in all questions relating to AI governance, closely followed by Europe. However, the Americas, Africa and Oceania lag far behind in the adoption of AI regulations and policies, with compliance rates averaging less than half of those achieved in Asia and Europe. Oceania, in particular, requires substantial support if it is to catch up with the other regions assessed, as only two to three of its countries have adopted AI-related regulations or policies.

Figure A.1 Numbers/Percentages of countries responding affirmatively to MSQ questions on AI regulation, 2022 and 2024 cumulative total



A.3.1 United Nations initiatives

The United Nations has been actively involved in discussions and activities surrounding AI technologies. The AI for Good Global Summit, first held in Geneva in June 2017, is an annual event organized by the International Telecommunication Union (ITU) and various partners within and outside the United Nations system. The Summit serves as a prominent platform for advocating the use of artificial intelligence in advancing the SDGs.[12] Other efforts undertaken by the United Nations and its agencies to enhance understanding and implement AI, are well documented in the ITU publication *United Nations Activities on Artificial Intelligence (AI) 2022* (Please also refer to the Annex A.18 for a detailed list of UN initiatives on AI). The United Nations addresses AI topics and issues internally and through its specialized agencies, and discussions on AI are incorporated into the work of existing committees and bodies, including the Commission on Science and Technology for Development and the Committee of Experts on Public Administration.

One milestone in the regulation of AI technologies by the United Nations and its agencies is the publication of the UNESCO Recommendation on the Ethics of Artificial Intelligence in 2021. This

first-ever global standard on AI ethics, adopted by all 193 Member States in 2023, is intended to serve as a universally accepted normative instrument on AI technologies. It incorporates four critical values and ten principles that can be promoted through amendments to existing legislation and the elaboration of new legislation.[13]

The High-Level Advisory Body on Artificial Intelligence was established by the Secretary-General of the United Nations in October 2023 announcing the interim report on governing AI for humanity in December of 2023 in which they call for strengthened international governance of AI carrying out seven critical functions. Likewise, the first resolution on artificial intelligence (A/RES/78/265) was adopted by the United Nations General Assembly in March 2024 seeking methods to implement a safe, secure, and trustworthy artificial intelligence systems, followed by the resolution that calls for enhanced international cooperation (A/RES/78/311), marking another set of milestones in the international governance of AI technologies. The resolutions recognize that AI technology, when used responsibly, can contribute significantly to the achievement of all 17 SDGs by fostering economic, social and environmental progress to improve the global welfare and advance sustainable development. Although the resolutions do not impose any immediate binding obligations, it identifies the need for cooperation with and support for developing countries in narrowing the digital divide and improving digital literacy to ensure more inclusive access to AI technologies.

Through these resolutions, the United Nations affirms that the ultimate objective of AI is to enhance human welfare and achieve sustainable development, consistent with the provisions of the Charter of the United Nations, the Universal Declaration of Human Rights, and the 2030 Agenda for Sustainable Development. Towards this end, the United Nations is committed to establishing a global consensus on the development and implementation of AI systems that are safe, secure and trustworthy.

A.3.2 National AI strategies

Many countries have established or are moving towards the establishment of AI regulations and policies. China, a leader in this area, announced its New Generation Artificial Intelligence Development Plan in 2017; this has since been supplemented by various regulations, including the 2023 Measures for the Management of Generative Artificial Intelligence Services, which address the meteoric rise of LLMs such as ChatGPT. Under these Measures, companies providing services to Chinese users are required to comply with Chinese regulations on personal information, take steps to protect the physical and psychological well-being of individuals, and uphold core values.[14]

The United States and the United Kingdom of Great Britain and Northern Ireland are not far behind in the regulatory race. In November 2023, the two countries released the joint Guidelines for Secure AI System Development, with contributions from various global ministries and agencies.[15] These Guidelines are important for two main reasons. First, they emphasize the importance of maintaining security not only during the initial development phase but also throughout the entire AI system development life cycle, adhering to secure-by-design principles. Second, they collectively represent one of the first internationally agreed-upon guidelines on AI development, setting a precedent for global cooperation in this field. Additionally, the United Kingdom of Great Britain and Northern Ireland hosted the "AI Safety Summit" in November 2023, marking the first global summit focused on AI safety. During this event, 28 countries adopted "The Bletchley Declaration on AI Safety." This was followed by the second summit, the "AI Seoul Summit," held in Seoul in 2024.

The European Commission has released its first-ever legal framework on AI, known as the AI Act, focusing on the risks associated with AI and positioning Europe to play a leading role globally. Announced in April 2021 and adopted in March 2024, this regulation addresses the risks of specific uses and applications of AI, including generative AI, by classifying them into four different levels: unacceptable risk, high risk, limited risk, and minimal risk. The primary objectives are to guarantee the safety and fundamental rights of people and businesses while also strengthening AI uptake,

investment and innovation across the European Union. Under this Act, high-risk AI systems – those used for critical infrastructure, education, product safety, employment, essential services, law enforcement, migration, and the administration of justice – will be subject to strict obligations in the areas of risk assessment, the quality of data sets, traceability, documentation, user information, human oversight, and robustness.

The Brazilian Artificial Intelligence Strategy guides the actions of Brazil in research, innovation and the ethical use of AI. The Strategy is based on five principles developed by the Organisation for Economic Co-operation and Development for the responsible management of AI systems: inclusive growth, human-centred values, transparency, robustness, and accountability. The Strategy aims to develop ethical principles, promote AI research and development, remove barriers to innovation, educate professionals, and foster international cooperation.[16]

A.3.3 Human-centric approaches

The public sector plays a vital role in the smooth functioning of society and can have a significant impact on people's lives. To best serve the public interest, governance should be based on core values that include integrity, equity, sustainability and accountability.[17] AI tools used within the public sector must reflect and reinforce these core values, but this may be problematic, as AI algorithms are set up to return the most likely result for a given task with no regard for ethics, social norms or societal standards. A human-centric approach to the adaptation and application of AI technologies is needed to ensure that AI-driven e-government is secure, effective and aligned with social values.

One potential strategy is to establish certification standards akin to those the United States Federal Communications Commission or the European Union has for electronic products but specifically tailored to AI. The widespread adoption of such standards would make it possible to detect and prohibit the use of AI systems that may pose hazards to humans.

Another potential human-centric approach involves incorporating a human element in the automation process. Although AI tools are powerful, they are not accountable for the results they provide, so human supervision is needed to close gaps in the chain of responsibility for AI processes and outcomes. Countries should implement a humans-in-the-loop or humans-on-the-loop approach to oversee the use and application of AI and ensure accountability. Where possible, countries should explore ways to integrate explainable AI (XAI) in digital administration and oversight to enhance transparency and allow for a thorough review of AI algorithms by human coordinators.

A great example of the human-centric approach is the aforementioned AI Act adopted in Europe, which seeks to regulate AI technologies using a four-tiered risk-based framework. This framework prohibits AI applications that present unacceptable risks to humans. Under this legislation, all suppliers introducing AI products or deploying AI systems in the European Union market must assess the risk level of their product or system and comply with the corresponding regulations.

A.4 AI literacy and capacity-building

The technology landscape is rapidly evolving as new digital models replace older ones to achieve superior performance; as part of this evolutionary dynamic, AI advancement is inevitable. The fear of negative outcomes from a premature implementation of AI technology should not hold countries back from exploring its potential. Regulations must be accompanied by capacity-building measures to advance AI technologies and optimize the benefits the technology brings. Countries worldwide are channeling substantial financial resources into improving and expanding AI technologies. The Coordinated Plan on Artificial Intelligence, a joint commitment between the European Commission, European Union member States, Norway, and Switzerland, was published in 2018 to ensure a future-proof, human-centric, value-based digital transformation. The Plan provides for accelerated

investment in AI, the implementation of comprehensive strategies and programmes, and the alignment of AI policies to prevent fragmentation within Europe.

AI development, adoption, and regulation are affected by the digital divide. Developing countries frequently encounter significant challenges in establishing robust data infrastructures. The inability to keep up with developed countries in digital development can pose a substantial threat to global stability, as the combined impact of AI and robotics is expected to transform market structures dramatically – similar to the transitions observed during the early stages of the Industrial Revolution but at a markedly accelerated pace. As the transformation progresses, traditional job markets are expected to experience major restructuring, with many traditional jobs being replaced by AI and automated systems[18,19,20,21]. According to the International Labour Organization (ILO), high-income countries have the potential to automate 5.1 per cent of jobs and 13.4 per cent of augmentation potential. In contrast, low-income countries have significantly lower automation and augmentation potential, with only 1.3 per cent and 10.4 per cent of jobs, respectively. This translates to high-income countries experiencing more disruptive effects in technological transition as enjoying higher net gains from the process. Thus, the failure to address key disparities risks exacerbating global wealth polarization.

However, the lack of infrastructure in developing countries will make this transition challenging. A large segment of the population may find themselves in a position similar to that of typists or telegraph operators in the past, losing their jobs without viable opportunities for transition, further polarizing the global economy.

This underscores the urgent need to enhance the AI-related capacity of developing countries. Highlighting key elements essential for strengthening AI capabilities in these nations is crucial for bridging the gap between developed and developing countries. Building AI capacity will enable developing countries to harness the benefits of AI technology, promote innovation, and ensure they are not left behind in the digital transformation.

A.4.1 Robust structure for data and digital governance

A pivotal starting point in promoting AI capacity-building in developing countries is the establishment of robust data governance and digital governance structures. AI technologies fundamentally rely on data for their implementation, irrespective of the specific methodology employed (whether it be supervised, unsupervised, or reinforcement learning). AI is a product of machine learning algorithms that use historical data divided into three sets: training, validation and testing.

Developing AI technologies without a robust data foundation is impractical and could result in investments becoming non-performing assets, risking the sustainability of AI technologies. Even the latest generative models (including transformer-based models) require the input of accurate data to return accurate results. In other words, if the accumulated data are inconsistent or have wrong instances, they will lead to the creation of underperforming algorithms or algorithms that provide wrong results. The importance of a solid data infrastructure cannot be overstated.

AI technologies are intrinsically digital. Developing an AI framework or governance system disconnected from well-studied data or digital governance frameworks is not only inefficient but also risks overlapping with or contradicting existing efforts to govern the digital environment. While technological development does not follow a strict technological sequence or linear model, countries should be open to leapfrogging into an AI-savvy state. However, the belief that AI development can occur without substantial investment in the fundamental infrastructure (including data infrastructure) required for the development of AI is a misconception. Integrating AI governance within the broader context of digital governance is crucial. This integration ensures coherence and effectiveness by building upon existing efforts in data and digital governance and prevents countries from wasting

the opportunity to benefit from prior advancements in the digital environment while preserving the potential for further AI development. It is recommended that new AI development initiatives be linked to and aligned with existing efforts to support the development of a connected digital infrastructure, including the digital public infrastructure and global digital cooperation initiatives (addressed in greater detail in chapter 3 of the present Survey).

This approach is consistent with a competency framework developed by UNESCO to support national digital capacity-building efforts. The three competency domains – digital planning and design, data use and governance, and digital management and execution – are essential for digital transformation and AI adoption. The approach also aligns with the conclusions of one of the first comprehensive overviews of AI use and impact in public services, which asserts that Governments should view AI governance as an extension of existing regulatory tools.[22]

A.4.2 AI literacy

Well-established data and digital governance structures must be complemented by strong human input for AI integration to be effective. Extensive research has shown that while knowledge in general and the understanding of technology more specifically are inherently non-rivalrous, they are not universally inclusive. Exclusion arises not only from protective measures such as patents and intellectual property rights but also from the substantial investment required to acquire the necessary background knowledge, particularly for complex concepts such as AI algorithms. Without

Box A.1 AI Singapore

AI Singapore was launched in 2017 to deepen AI capabilities in the country. This is an excellent example of an initiative that evolved as it was implemented, with programmes and subprogrammes added to support the development of a successful AI empowerement scheme. At present, the initiative incorporates six pillars: AI research, AI governance, AI technology, AI innovation, AI products, Learn AI.

The initiative started with a flagship programme called 100 Experiments. The two main objectives were to build real-world, deployable AI products and solutions for industries and to transfer knowledge and well-trained talent into the industrial sector. On the ground, the cycle was as follows: proposals were received from industries, engineering teams were formed, team members collaborated on creating AI solutions, and the solutions were transferred to the industries to enhance productivity and efficiency.

AI Singapore differs from other bootcamp programmes in that it focuses not only on creating AI solutions but also on identifying and training promising candidates to participate in the development of those solutions. In ideal circumstances, these apprentices are positioned as project coordinators for the same solutions when they complete the AI Apprenticeship programme.

100 Experiments programme structure

Source: AI Singapore, "100 Experiments programme structure", available at https://aisingapore.org/innovation/100e/.

that foundational understanding, technology-related knowledge and ultimately technology itself are largely inaccessible to the general public. The ability to understand and take advantage of widely distributed knowledge and technology is known as social or absorptive capacity.[23,24]

Digital capacity-building should target both producers (AI developers) and consumers (the end users or beneficiaries) of AI technologies in order to realize optimal economic and social benefits. Governments must strengthen citizens' basic awareness and understanding of AI concepts and applications by increasing their exposure to relevant concepts and providing AI education to build AI literacy. Bootcamps are an effective way to increase AI literacy within the general population. Singapore offers an integrated bootcamp programme aligned with their AI capability programme (AI singapore) designed to identify and train AI professionals (see box 1).

The strengthening of AI capabilities in developing countries has also been undertaken through partnerships with world-renowned universities. Carnegie Mellon University Africa, for example, offers master's of science degrees in information technology, electrical and computer engineering, and engineering artificial intelligence. These programmes are designed to train innovative and technically proficient engineers within an African context. Leveraging the strong reputation of Carnegie Mellon, the University extends its influence beyond Rwanda, attracting students from across the African continent. Currently, the university has more than 300 students and more than 550 alumni representing 19 nationalities.

Improving AI capacity is an urgent priority for developing countries but is actually recommended for developed countries as well since AI literacy is required at all levels. To address this need, the AI4GOV programme – based in Spain and co-financed by the Connecting Europe Facility of the European Union – is administering a master's programme in artificial intelligence for public services. This ten-month graduate programme is designed to prepare future leaders in digital transformation, equipping them with the knowledge and skills they need to manage the development of AI and its adoption in the public sector.

A.4.3 Regulatory sandboxes

As noted previously, AI development is occurring at a much faster pace than the implementation of AI regulations and policies. The increasing complexity of AI systems makes regulation particularly challenging. Discussions are starting to shift from narrow AI to general AI as development moves into uncharted territory, where outcomes are unknown but potentially transformative (see Box 2). Governments often lack the capabilities and expertise to fully understand the implications and anticipate the repercussions of emerging technologies. This can result in the overregulation or underregulation of AI technologies, depending on the strategy each country adopts. Overregulation can undermine the development of the AI industry but can be necessary in critical sectors such as health and education. Likewise, underregulation can create risks for end-users, lead to policy failures, and exacerbate digital exclusion. In this context, regulations must be carefully designed and accompanied by policies that can complement existing regulations and do not limit creativity or the potential to develop emerging technologies such as AI.

Regulatory sandboxes are innovation-friendly regulatory testing grounds that can help prevent overregulation and underregulation scenarios and give pioneering companies a temporary break from regulations while customized regulatory solutions are being developed. Sandboxes allow the testing of new products, services or processes in a controlled environment with a limited number of users, providing a safe testbed. The UN DESA policy brief on sandboxing highlights numerous successful cases of sandbox processes and frameworks, including those used for the adoption of digital currency in the Maldives and the promotion of cost-effective energy sources in Kazakhstan.[25] The practicality of this approach has been widely recognized, with a total of 218 regulatory sandboxes created by 2020.[26]

Box A.2 Classifying AI technologies

There are multiple ways to classify AI technologies, with capability-based classification being the most widely used.[27]

Narrow AI is also known as weak AI. It can be trained to accomplish a specific task but cannot operate beyond that defined task. This is the only type of AI existing today.

General AI, also known as strong AI, remains a theoretical concept at this point. This type of AI can use previous learning and skills to accomplish new tasks without the need for humans to train the underlying model.

Super AI, or artificial superintelligence, is also strictly theoretical. It refers to those types of AI that surpass humans in cognitive abilities such as thinking, reasoning, learning, and making judgements. At present, these types of AI are projected to experience emotions, have needs, and possess their own beliefs and desires.

Source: IBM, "Understanding the different types of artificial intelligence", article,12 October 2023, available at https://www.ibm.com/think/topics/artificial-intelligence-types.

The success of regulatory sandboxes in sectors such as fintech and blockchain has paved the way for similar initiatives in artificial intelligence. In 2022, Spain started developing its first AI sandbox, anticipating the gradual enforcement of the European Union AI Act. This sandbox is designed to provide a secure environment for experimentation while ensuring compliance with the Act. With the enactment of Royal Decree 817/2023 in November 2023, the sandbox will be implemented in the coming years to test the application of AI Act regulations on high-risk AI systems, general-purpose AI systems, and foundational AI models. In 2024, the Government of Singapore set up the country's first sandbox on generative AI to allow small and medium-sized enterprises to gain experience in developing and applying relevant AI solutions. UN DESA is promoting regulatory sandboxes for AI, recognizing the increasingly important role AI will play in digital transformation in the public sector to support the effective delivery of public services and the achievement of the SDGs. During the United Nations Public Service Forum and Awards Ceremony held in Incheon in June 2024, UN DESA held a workshop on fostering innovation through digital sandboxes and AI sandboxes.

The key recommendations presented below are aligned with the aims of these initiatives, highlighting the importance of fostering innovation while ensuring the establishment of robust regulatory frameworks.

A.5 Key Recommendations

There are three key recommendations that highlight essential steps for creating and sustaining a cohesive, innovative, and inclusive AI landscape in the public sector.

A.5.1 Building upon existing efforts

Key recommendation: Integrating AI governance within existing digital frameworks is crucial for creating a cohesive regulatory environment that reduces redundancy, supports innovation, enhances efficiency and security, and promotes public trust in digital technologies.

The significance and potential of emerging AI technologies compel countries to develop new frameworks that both regulate and empower this assortment of advanced digital tools. However, AI technologies are ultimately part of a broader array of digital technologies created by scientists and engineers that are interdependent and collectively drive digital transformation. Governing these

technologies separately can lead to duplicated efforts, conflicting regulations, and fragmented systems that waste resources and create operational inefficiencies. For example, data privacy and security regulations applied to AI should be consistent with those governing other digital technologies to avoid confusion and legal discrepancies.

The integration of AI governance within existing digital frameworks is essential for streamlining regulatory processes, maximizing efficiency, reducing redundancy, and ensuring cohesive regulatory practices. This approach not only supports the development and deployment of AI technologies but also strengthens overall digital governance, promoting innovation and protecting public interests. Implementing independent AI management technologies can conflict with established digital governance policies, leading to disruptions in AI advancements, increased operational costs, and potential legal disputes.

Ensuring data privacy and security becomes more challenging when AI governance is not aligned with broader digital strategies. An integrated framework helps avoid these conflicts, facilitating a smoother implementation of AI technologies. The digital and informational nature of AI, along with its heavy reliance on historical data, necessitates that AI regulation and governance be closely integrated with digital and data governance efforts. This integration ensures that AI technologies benefit from existing data management practices, enhancing their effectiveness and security. By building upon established digital governance structures, countries can better manage the complexities of AI, ensuring that these technologies are both well regulated and empowered to contribute to societal advancement.

A.5.2 Laying the appropriate foundations for the advancement of AI technologies

Key recommendation: The advancement of AI requires a balanced approach that includes regulation, investment in strengthening AI capacity and literacy, and the creation of supportive infrastructures. This holistic strategy will enable countries to harness the full potential of AI technologies, ensuring that they contribute positively to sustainable growth and development and societal advancement.

The advancement of AI technologies is inevitable, given the wide range of efficiencies and other benefits they offer, raising the prospect of a fourth industrial revolution and significant disruptions to the job market. However, these advancements may also lead to considerable social unrest, such as unemployment resulting from rapid changes in the job market. Unlike in previous eras, the world has raised global awareness, underscoring the necessity of investing in universal solid social protection systems to support marginalized groups and creating appropriate institutions and mechanisms to enable a smoother transition.

Thus, under this new condition, countries should not limit themselves to regulating AI technologies but should also invest in strengthening AI capacity and AI literacy. For the most developed countries, setting up various types of regulatory sandboxes can be an effective strategy. These sandboxes allow for rapid development within a controlled environment, preventing risks from causing unforeseen threats to humanity. This approach enables innovation while maintaining safety and ethical standards. For countries lacking the appropriate infrastructure, establishing robust data frameworks and enhancing national AI literacy are crucial steps. However, these efforts must be integrated and coordinated in a holistic way rather than pursued independently by each institution. By creating a cohesive strategy, developing countries can generate both supply and demand for AI technology, fostering sustainable growth and development in this sector.

A.5.3 Engaging in collective action

Key recommendation: The advancement and regulation of AI technologies require collective global action to ensure inclusive, safe and effective development. By working together, countries can

establish a comprehensive and inclusive framework to ensure that AI technologies are used safely and effectively, benefiting all of humanity.

A few countries with the potential to pioneer development on this new frontier are spearheading the advancement and regulation of AI technologies. However, AI technologies are among those transformative phenomena that cannot be defined or regulated by a small group of nations since AI has the potential to alter daily human life fundamentally. Given this transformative potential, international rule making bodies such as the United Nations must adopt a proactive stance. The United Nations should promote the harmonization of national perspectives on AI and work towards establishing a general normative framework that all nations can agree upon and adhere to. This supports the rationalization behind the adoption of resolution A/RES/78/265, which focuses on achieving safe, effective AI regulation while allowing the technology to develop to its full potential. International organizations should recognize that AI exclusion can occur at the local, national, regional and international levels, so it is crucial that an inclusive approach be pursued to prevent specific groups from being marginalized by AI technologies. As part of this effort, it is essential to ensure that all stakeholders, including those from less developed regions, have a voice in the global dialogue on AI. In a broad sense, international institutions must be persistent in their efforts to help lay the necessary foundations for a highly digitalized, rapidly changing world. This will involve supporting the development of different strategies tailored to the needs of each country based on their level of development and AI readiness. By addressing the challenges and opportunities unique to each country, international institutions can help create and sustain a balanced and equitable global AI landscape.

Endnotes

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ANNEX

Table E-Government Development Index (EGDI) 2024 by countries

Country	Region	Sub-Region	EDGI Group	Rating Class	Rank	EGDI 2024	OSI	TII	HCI	EPI	"Level of Income"
Afghanistan	Asia	Southern Asia	Low EGDI	L2	188	0.2083	0.1438	0.2167	0.2643	0.1096	LIC
Albania	Europe	Southern Europe	Very High EGDI	V1	62	0.8000	0.8144	0.7750	0.8106	0.7260	UMC
Algeria	Africa	Northern Africa	High EGDI	H2	116	0.5956	0.3320	0.8129	0.6418	0.0548	LMC
Andorra	Europe	Southern Europe	High EGDI	HV	88	0.6893	0.4780	0.9231	0.6668	0.5479	HIC
Angola	Africa	Middle Africa	Middle EGDI	M3	156	0.4149	0.3962	0.3724	0.4760	0.2192	LMC
Antigua and Barbuda	Americas	Caribbean	High EGDI	H3	105	0.6428	0.4166	0.7943	0.7176	0.3425	HIC
Argentina	Americas	South America	Very High EGDI	V2	42	0.8573	0.7965	0.8425	0.9330	0.6301	UMC
Armenia	Asia	Western Asia	Very High EGDI	V2	48	0.8422	0.7922	0.8782	0.8561	0.8493	UMC
Australia	Oceania	Australia and New Zealand	Very High EGDI	VH	8	0.9577	0.9222	0.9509	1.0000	0.8630	HIC
Austria	Europe	Western Europe	Very High EGDI	V3	22	0.9065	0.8383	0.9810	0.9003	0.7808	HIC
Azerbaijan	Asia	Western Asia	Very High EGDI	V1	74	0.7607	0.7386	0.8203	0.7233	0.4932	UMC
Bahamas	Americas	Caribbean	High EGDI	HV	83	0.7143	0.5402	0.8652	0.7376	0.3151	HIC
Bahrain	Asia	Western Asia	Very High EGDI	VH	18	0.9196	0.9030	0.9877	0.8680	0.9041	HIC
Bangladesh	Asia	Southern Asia	High EGDI	H3	100	0.6570	0.7374	0.6501	0.5834	0.6164	LMC
Barbados	Americas	Caribbean	High EGDI	H3	91	0.6815	0.4976	0.7624	0.7845	0.3288	HIC
Belarus	Europe	Eastern Europe	High EGDI	HV	77	0.7445	0.5760	0.9156	0.7419	0.4932	UMC
Belgium	Europe	Western Europe	Very High EGDI	V2	56	0.8121	0.7224	0.8698	0.8442	0.5068	HIC
Belize	Americas	Central America	Middle EGDI	MH	141	0.4872	0.4054	0.5292	0.5270	0.2329	UMC
Benin	Africa	Western Africa	Middle EGDI	MH	146	0.4578	0.5202	0.4817	0.3715	0.3699	LMC
Bhutan	Asia	Southern Asia	High EGDI	H3	103	0.6511	0.5886	0.8169	0.5478	0.4932	LMC
Bolivia	Americas	South America	High EGDI	H3	99	0.6651	0.5987	0.7089	0.6876	0.4247	LMC
Bosnia and Herzegovina	Europe	Southern Europe	High EGDI	H2	107	0.6329	0.5003	0.7763	0.6222	0.5479	UMC

Table *(continued)*

Country	Region	Sub-Region	EDGI Group	Rating Class	Rank	EGDI 2024	OSI	TII	HCI	EPI	"Level of Income"
Botswana	Africa	Southern Africa	High EGDI	H2	112	0.6118	0.3985	0.8649	0.5719	0.2740	UMC
Brazil	Americas	South America	Very High EGDI	V2	50	0.8403	0.9063	0.8068	0.8077	0.8630	UMC
Brunei Darussalam	Asia	South-Eastern Asia	Very High EGDI	V1	75	0.7554	0.5802	0.9868	0.6991	0.4658	HIC
Bulgaria	Europe	Eastern Europe	Very High EGDI	V2	55	0.8145	0.7727	0.9171	0.7538	0.6712	UMC
Burkina Faso	Africa	Western Africa	Middle EGDI	M1	175	0.2895	0.3376	0.3640	0.1668	0.2192	LIC
Burundi	Africa	Eastern Africa	Low EGDI	LM	183	0.2480	0.3146	0.0330	0.3965	0.2192	LIC
Cabo Verde	Africa	Western Africa	High EGDI	H2	111	0.6238	0.6892	0.6128	0.5694	0.5479	LMC
Cambodia	Asia	South-Eastern Asia	High EGDI	H2	120	0.5754	0.4503	0.7609	0.5149	0.3151	LMC
Cameroon	Africa	Middle Africa	Middle EGDI	M3	155	0.4294	0.3988	0.3700	0.5193	0.4247	LMC
Canada	Americas	Northern America	Very High EGDI	V2	47	0.8452	0.8552	0.8078	0.8725	0.9178	HIC
Central African Republic	Africa	Middle Africa	Low EGDI	L1	193	0.0947	0.1128	0.0000	0.1713	0.0822	LIC
Chad	Africa	Middle Africa	Low EGDI	L2	189	0.1785	0.2674	0.1194	0.1488	0.3151	LIC
Chile	Americas	South America	Very High EGDI	V3	31	0.8827	0.8612	0.9455	0.8413	0.8356	HIC
China	Asia	Eastern Asia	Very High EGDI	V3	35	0.8718	0.9258	0.8995	0.7902	0.9315	UMC
Colombia	Americas	South America	Very High EGDI	V1	68	0.7793	0.7521	0.8065	0.7793	0.7397	UMC
Comoros	Africa	Eastern Africa	Middle EGDI	M1	180	0.2586	0.0230	0.3537	0.3992	0.0000	LMC
Congo	Africa	Middle Africa	Middle EGDI	M2	166	0.3391	0.2760	0.2776	0.4637	0.0822	LMC
Costa Rica	Americas	Central America	Very High EGDI	V1	61	0.8009	0.7217	0.8933	0.7877	0.7260	UMC
Croatia	Europe	Southern Europe	Very High EGDI	V3	32	0.8818	0.8735	0.9180	0.8538	0.4110	HIC
Cuba	Americas	Caribbean	Middle EGDI	MH	139	0.4921	0.2298	0.5318	0.7148	0.9178	UMC
Cyprus	Asia	Western Asia	Very High EGDI	V2	38	0.8619	0.8217	0.8941	0.8698	0.0548	HIC
Czechia	Europe	Eastern Europe	Very High EGDI	V2	54	0.8239	0.7006	0.9204	0.8508	0.6986	HIC
Côte d'Ivoire	Africa	Western Africa	High EGDI	H1	124	0.5587	0.5219	0.6693	0.4848	0.5890	LMC
Democratic People's Republic of Korea	Asia	Eastern Asia	Low EGDI	L3	184	0.2320	0.0291	0.1745	0.4924	0.0000	LIC

Table *(continued)*

Country	Region	Sub-Region	EDGI Group	Rating Class	Rank	EGDI 2024	OSI	TII	HCI	EPI	"Level of Income"
Democratic Republic of the Congo	Africa	Middle Africa	Middle EGDI	M1	179	0.2715	0.2067	0.1591	0.4487	0.2466	LIC
Denmark	Europe	Northern Europe	Very High EGDI	VH	1	0.9847	0.9992	0.9966	0.9584	0.9863	HIC
Djibouti	Africa	Eastern Africa	Middle EGDI	M1	174	0.2911	0.2092	0.3840	0.2800	0.0959	LMC
Dominica	Americas	Caribbean	High EGDI	H1	127	0.5445	0.3798	0.6757	0.5781	0.3014	UMC
Dominican Republic	Americas	Caribbean	High EGDI	HV	85	0.7013	0.6405	0.7444	0.7189	0.6575	UMC
Ecuador	Americas	South America	Very High EGDI	V1	67	0.7800	0.8851	0.6833	0.7715	0.8767	UMC
Egypt	Africa	Northern Africa	High EGDI	H3	95	0.6699	0.7002	0.6946	0.6150	0.5890	LMC
El Salvador	Americas	Central America	High EGDI	H2	115	0.5988	0.5090	0.7526	0.5348	0.3836	UMC
Equatorial Guinea	Africa	Middle Africa	Middle EGDI	M1	176	0.2855	0.1932	0.2532	0.4102	0.2329	UMC
Eritrea	Africa	Eastern Africa	Low EGDI	L2	190	0.1576	0.0000	0.1405	0.3324	0.0137	LIC
Estonia	Europe	Northern Europe	Very High EGDI	VH	2	0.9727	0.9954	0.9731	0.9497	0.9589	HIC
Eswatini	Africa	Southern Africa	High EGDI	H2	113	0.6081	0.4557	0.7851	0.5836	0.3836	LMC
Ethiopia	Africa	Eastern Africa	Middle EGDI	M2	169	0.3111	0.3420	0.2659	0.3254	0.1644	LIC
Fiji	Oceania	Melanesia	High EGDI	H3	93	0.6754	0.5343	0.7507	0.7413	0.3973	UMC
Finland	Europe	Northern Europe	Very High EGDI	VH	9	0.9575	0.9097	0.9791	0.9836	0.8904	HIC
France	Europe	Western Europe	Very High EGDI	V3	34	0.8744	0.8440	0.9228	0.8565	0.8082	HIC
Gabon	Africa	Middle Africa	High EGDI	H2	121	0.5741	0.3187	0.8263	0.5772	0.1233	UMC
Gambia	Africa	Western Africa	Middle EGDI	M1	181	0.2552	0.0955	0.3877	0.2823	0.1781	LIC
Georgia	Asia	Western Asia	Very High EGDI	V1	69	0.7792	0.5652	0.9071	0.8654	0.5616	UMC
Germany	Europe	Western Europe	Very High EGDI	VH	12	0.9382	0.9238	0.9236	0.9672	0.9726	HIC
Ghana	Africa	Western Africa	High EGDI	H2	108	0.6317	0.6084	0.7281	0.5586	0.5342	LMC
Greece	Europe	Southern Europe	Very High EGDI	V3	36	0.8674	0.8145	0.8657	0.9219	0.6712	HIC
Grenada	Americas	Caribbean	High EGDI	H3	104	0.6458	0.5056	0.6767	0.7550	0.2466	UMC
Guatemala	Americas	Central America	High EGDI	H2	122	0.5738	0.6538	0.5843	0.4834	0.4658	UMC
Guinea	Africa	Western Africa	Middle EGDI	M2	160	0.4006	0.4808	0.4323	0.2887	0.5068	LMC

Table *(continued)*

Country	Region	Sub-Region	EDGI Group	Rating Class	Rank	EGDI 2024	OSI	TII	HCI	EPI	"Level of Income"
Guinea-Bissau	Africa	Western Africa	Middle EGDI	M2	170	0.3083	0.1270	0.4902	0.3077	0.2192	LIC
Guyana	Americas	South America	High EGDI	H1	128	0.5443	0.3455	0.6942	0.5933	0.2192	HIC
Haiti	Americas	Caribbean	Low EGDI	L3	186	0.2116	0.1379	0.2087	0.2883	0.0959	LMC
Honduras	Americas	Central America	Middle EGDI	MH	142	0.4856	0.4587	0.4799	0.5182	0.3014	LMC
Hungary	Europe	Eastern Europe	Very High EGDI	V1	59	0.8043	0.7144	0.8282	0.8703	0.5479	HIC
Iceland	Europe	Northern Europe	Very High EGDI	VH	5	0.9671	0.9076	0.9983	0.9953	0.9589	HIC
India	Asia	Southern Asia	High EGDI	H3	97	0.6678	0.8184	0.5700	0.6149	0.6575	LMC
Indonesia	Asia	South-Eastern Asia	Very High EGDI	V1	64	0.7991	0.8035	0.8645	0.7293	0.7945	UMC
Iran (Islamic Republic of)	Asia	Southern Asia	High EGDI	H3	101	0.6564	0.3773	0.8987	0.6932	0.1781	LMC
Iraq	Asia	Western Asia	Middle EGDI	MH	148	0.4572	0.1875	0.6874	0.4967	0.0959	UMC
Ireland	Europe	Northern Europe	Very High EGDI	V3	20	0.9138	0.8768	0.9599	0.9046	0.9178	HIC
Israel	Asia	Western Asia	Very High EGDI	V3	23	0.9014	0.8541	0.9763	0.8739	0.6986	HIC
Italy	Europe	Southern Europe	Very High EGDI	V2	51	0.8356	0.7624	0.9017	0.8426	0.6575	HIC
Jamaica	Americas	Caribbean	High EGDI	H3	96	0.6678	0.5677	0.7296	0.7060	0.4384	UMC
Japan	Asia	Eastern Asia	Very High EGDI	VH	13	0.9351	0.9427	0.9509	0.9117	0.9863	HIC
Jordan	Asia	Western Asia	High EGDI	HV	89	0.6849	0.7591	0.6499	0.6458	0.6164	LMC
Kazakhstan	Asia	Central Asia	Very High EGDI	V3	24	0.9009	0.9390	0.9235	0.8403	0.8493	UMC
Kenya	Africa	Eastern Africa	High EGDI	H2	109	0.6314	0.7770	0.5901	0.5271	0.5205	LMC
Kiribati	Oceania	Micronesia	Middle EGDI	MH	147	0.4572	0.3904	0.3544	0.6269	0.3288	LMC
Kuwait	Asia	Western Asia	Very High EGDI	V1	66	0.7812	0.6365	0.9988	0.7083	0.3014	HIC
Kyrgyzstan	Asia	Central Asia	High EGDI	HV	78	0.7316	0.6072	0.8815	0.7061	0.4658	LMC
Lao People's Democratic Republic	Asia	South-Eastern Asia	Middle EGDI	M3	152	0.4404	0.3265	0.5338	0.4608	0.2877	LMC
Latvia	Europe	Northern Europe	Very High EGDI	V3	29	0.8852	0.8092	0.9660	0.8805	0.7808	HIC
Lebanon	Asia	Western Asia	High EGDI	H1	126	0.5449	0.4489	0.6425	0.5433	0.4658	LMC
Lesotho	Africa	Southern Africa	Middle EGDI	M3	157	0.4123	0.2864	0.4643	0.4862	0.2055	LMC

Table *(continued)*

Country	Region	Sub-Region	EDGI Group	Rating Class	Rank	EGDI 2024	OSI	TII	HCI	EPI	"Level of Income"
Liberia	Africa	Western Africa	Middle EGDI	M1	182	0.2513	0.2633	0.1238	0.3669	0.1644	LIC
Libya	Africa	Northern Africa	High EGDI	H1	125	0.5466	0.0808	0.9639	0.5951	0.0137	UMC
Liechtenstein	Europe	Western Europe	Very High EGDI	V2	44	0.8528	0.7416	0.9906	0.8263	0.6575	HIC
Lithuania	Europe	Northern Europe	Very High EGDI	V3	21	0.9110	0.8839	0.9631	0.8861	0.8356	HIC
Luxembourg	Europe	Western Europe	Very High EGDI	V2	45	0.8466	0.7555	0.9888	0.7955	0.6301	HIC
Madagascar	Africa	Eastern Africa	Middle EGDI	M2	168	0.3235	0.4045	0.1518	0.4141	0.3014	LIC
Malawi	Africa	Eastern Africa	Middle EGDI	M2	163	0.3753	0.4625	0.1886	0.4749	0.4521	LIC
Malaysia	Asia	South-Eastern Asia	Very High EGDI	V1	57	0.8111	0.7280	0.9862	0.7192	0.6986	UMC
Maldives	Asia	Southern Asia	High EGDI	H3	94	0.6745	0.6220	0.7886	0.6130	0.4795	UMC
Mali	Africa	Western Africa	Middle EGDI	M1	173	0.3005	0.3334	0.4432	0.1250	0.2740	LIC
Malta	Europe	Southern Europe	Very High EGDI	V3	28	0.8886	0.8749	0.9747	0.8162	0.7397	HIC
Marshall Islands	Oceania	Micronesia	Middle EGDI	MH	143	0.4823	0.3586	0.3047	0.7836	0.3288	UMC
Mauritania	Africa	Western Africa	Middle EGDI	M2	165	0.3491	0.1688	0.5824	0.2961	0.1233	LMC
Mauritius	Africa	Eastern Africa	Very High EGDI	V1	76	0.7506	0.5903	0.9159	0.7456	0.4110	UMC
Mexico	Americas	Central America	Very High EGDI	V1	65	0.7850	0.7637	0.8310	0.7603	0.7397	UMC
Micronesia (Federated States of)	Oceania	Micronesia	Middle EGDI	M2	167	0.3235	0.2621	0.1350	0.5735	0.1370	LMC
Monaco	Europe	Western Europe	High EGDI	HV	82	0.7175	0.4838	0.9171	0.7515	0.1507	HIC
Mongolia	Asia	Eastern Asia	Very High EGDI	V2	46	0.8457	0.8222	0.9374	0.7775	0.7808	LMC
Montenegro	Europe	Southern Europe	High EGDI	HV	81	0.7211	0.5214	0.9229	0.7190	0.5068	UMC
Morocco	Africa	Northern Africa	High EGDI	HV	90	0.6841	0.5618	0.8827	0.6078	0.4384	LMC
Mozambique	Africa	Eastern Africa	Middle EGDI	M1	177	0.2848	0.3959	0.0632	0.3952	0.2055	LIC
Myanmar	Asia	South-Eastern Asia	High EGDI	H1	138	0.5001	0.3259	0.6662	0.5081	0.1644	LMC
Namibia	Africa	Southern Africa	High EGDI	H2	114	0.6007	0.4996	0.7288	0.5738	0.2740	UMC
Nauru	Oceania	Micronesia	Middle EGDI	M3	151	0.4454	0.2439	0.5863	0.5061	0.2329	HIC
Nepal	Asia	Southern Asia	High EGDI	H2	119	0.5781	0.4481	0.7653	0.5210	0.2192	LMC

Table *(continued)*

Country	Region	Sub-Region	EDGI Group	Rating Class	Rank	EGDI 2024	OSI	TII	HCI	EPI	"Level of Income"
Netherlands	Europe	Western Europe	Very High EGDI	VH	10	0.9538	0.9212	0.9715	0.9688	0.9315	HIC
New Zealand	Oceania	Australia and New Zealand	Very High EGDI	VH	16	0.9265	0.9453	0.8728	0.9615	0.9315	HIC
Nicaragua	Americas	Central America	High EGDI	H1	132	0.5318	0.4493	0.5851	0.5610	0.2329	LMC
Niger	Africa	Western Africa	Low EGDI	L3	187	0.2116	0.3084	0.1578	0.1685	0.2055	LIC
Nigeria	Africa	Western Africa	Middle EGDI	MH	144	0.4815	0.5372	0.4836	0.4236	0.3699	LMC
North Macedonia	Europe	Southern Europe	High EGDI	HV	84	0.7070	0.6642	0.7546	0.7023	0.5753	UMC
Norway	Europe	Northern Europe	Very High EGDI	VH	15	0.9315	0.9117	0.9654	0.9175	0.8630	HIC
Oman	Asia	Western Asia	Very High EGDI	V2	41	0.8576	0.8077	0.9674	0.7977	0.6575	HIC
Pakistan	Asia	Southern Asia	High EGDI	H1	136	0.5096	0.7042	0.4745	0.3500	0.4932	LMC
Palau	Oceania	Micronesia	High EGDI	H1	137	0.5072	0.2787	0.4910	0.7520	0.3014	UMC
Panama	Americas	Central America	High EGDI	HV	79	0.7298	0.6505	0.8523	0.6866	0.5205	HIC
Papua New Guinea	Oceania	Melanesia	Middle EGDI	M1	171	0.3076	0.3392	0.1851	0.3984	0.1918	LMC
Paraguay	Americas	South America	High EGDI	HV	80	0.7251	0.6712	0.7947	0.7093	0.6027	UMC
Peru	Americas	South America	Very High EGDI	V1	58	0.8070	0.8377	0.8364	0.7469	0.7534	UMC
Philippines	Asia	South-Eastern Asia	Very High EGDI	V1	73	0.7621	0.8054	0.7554	0.7256	0.7260	LMC
Poland	Europe	Eastern Europe	Very High EGDI	V3	37	0.8648	0.8037	0.9603	0.8304	0.7534	HIC
Portugal	Europe	Southern Europe	Very High EGDI	V2	49	0.8415	0.7878	0.8979	0.8389	0.6438	HIC
Qatar	Asia	Western Asia	Very High EGDI	V2	53	0.8244	0.7655	0.9963	0.7114	0.4795	HIC
Republic of Korea	Asia	Eastern Asia	Very High EGDI	VH	4	0.9679	1.0000	0.9917	0.9120	0.9726	HIC
Republic of Moldova	Europe	Eastern Europe	Very High EGDI	V1	70	0.7719	0.7264	0.8118	0.7776	0.7260	UMC
Romania	Europe	Eastern Europe	Very High EGDI	V1	72	0.7636	0.6548	0.8922	0.7439	0.6849	HIC
Russian Federation	Europe	Eastern Europe	Very High EGDI	V2	43	0.8532	0.7766	0.9512	0.8319	0.6438	UMC
Rwanda	Africa	Eastern Africa	High EGDI	H2	118	0.5799	0.8207	0.3724	0.5467	0.7534	LIC
Saint Kitts and Nevis	Americas	Caribbean	High EGDI	H2	110	0.6305	0.3039	0.8675	0.7202	0.2055	HIC
Saint Lucia	Americas	Caribbean	High EGDI	H1	133	0.5255	0.3229	0.6498	0.6037	0.1370	UMC

Table *(continued)*

Country	Region	Sub-Region	EDGI Group	Rating Class	Rank	EGDI 2024	OSI	TII	HCI	EPI	"Level of Income"
Saint Vincent and the Grenadines	Americas	Caribbean	High EGDI	H2	117	0.5876	0.3906	0.6767	0.6956	0.3425	UMC
Samoa	Oceania	Polynesia	Middle EGDI	MH	140	0.4899	0.3638	0.4606	0.6453	0.3014	LMC
San Marino	Europe	Southern Europe	High EGDI	H3	102	0.6551	0.3575	0.9491	0.6587	0.1233	HIC
Sao Tome and Principe	Africa	Middle Africa	Middle EGDI	M3	154	0.4308	0.2156	0.4839	0.5928	0.1644	LMC
Saudi Arabia	Asia	Western Asia	Very High EGDI	VH	6	0.9602	0.9899	0.9841	0.9067	0.9589	HIC
Senegal	Africa	Western Africa	High EGDI	H1	135	0.5162	0.4779	0.7328	0.3380	0.4247	LMC
Serbia	Europe	Southern Europe	Very High EGDI	V2	39	0.8618	0.8540	0.9221	0.8094	0.8904	UMC
Seychelles	Africa	Eastern Africa	High EGDI	H3	92	0.6773	0.4638	0.8913	0.6769	0.3014	HIC
Sierra Leone	Africa	Western Africa	Middle EGDI	M1	172	0.3042	0.3823	0.2585	0.2718	0.3288	LIC
Singapore	Asia	South-Eastern Asia	Very High EGDI	VH	3	0.9691	0.9831	0.9881	0.9362	0.9589	HIC
Slovakia	Europe	Eastern Europe	Very High EGDI	V1	60	0.8021	0.7097	0.8985	0.7982	0.6986	HIC
Slovenia	Europe	Southern Europe	Very High EGDI	V3	33	0.8759	0.8640	0.9107	0.8530	0.7808	HIC
Solomon Islands	Oceania	Melanesia	Middle EGDI	M2	164	0.3681	0.4970	0.1811	0.4262	0.3699	LMC
Somalia	Africa	Eastern Africa	Low EGDI	L1	191	0.1468	0.2971	0.1432	0.0000	0.2877	LIC
South Africa	Africa	Southern Africa	Very High EGDI	V2	40	0.8616	0.8872	0.8951	0.8026	0.8356	UMC
South Sudan	Africa	Eastern Africa	Low EGDI	L1	192	0.1191	0.1504	0.0547	0.1521	0.1096	LIC
Spain	Europe	Southern Europe	Very High EGDI	VH	17	0.9206	0.9054	0.9603	0.8961	0.8082	HIC
Sri Lanka	Asia	Southern Asia	High EGDI	H3	98	0.6667	0.5494	0.7936	0.6570	0.4110	LMC
Sudan	Africa	Northern Africa	Middle EGDI	M1	178	0.2759	0.1293	0.4392	0.2593	0.0685	LIC
Suriname	Americas	South America	High EGDI	H3	106	0.6365	0.4814	0.8714	0.5568	0.2877	UMC
Sweden	Europe	Northern Europe	Very High EGDI	VH	14	0.9326	0.8836	0.9868	0.9275	0.7945	HIC
Switzerland	Europe	Western Europe	Very High EGDI	V3	26	0.9003	0.8408	0.9576	0.9026	0.8219	HIC
Syrian Arab Republic	Asia	Western Asia	Middle EGDI	M2	162	0.3888	0.3068	0.4426	0.4169	0.0685	LIC
Tajikistan	Asia	Central Asia	High EGDI	H1	123	0.5606	0.4476	0.5810	0.6531	0.2740	LMC
Thailand	Asia	South-Eastern Asia	Very High EGDI	V2	52	0.8351	0.7611	0.9410	0.8032	0.7534	UMC

Table *(continued)*

Country	Region	Sub-Region	EDGI Group	Rating Class	Rank	EGDI 2024	OSI	TII	HCI	EPI	"Level of Income"
Timor-Leste	Asia	South-Eastern Asia	Middle EGDI	M3	159	0.4020	0.3406	0.3551	0.5104	0.3288	LMC
Togo	Africa	Western Africa	Middle EGDI	M2	161	0.3920	0.4472	0.2474	0.4813	0.4521	LIC
Tonga	Oceania	Polynesia	High EGDI	H1	134	0.5164	0.3220	0.4784	0.7488	0.3288	UMC
Trinidad and Tobago	Americas	Caribbean	High EGDI	HV	86	0.6973	0.5999	0.7745	0.7174	0.3288	HIC
Tunisia	Africa	Northern Africa	High EGDI	HV	87	0.6935	0.5951	0.8357	0.6497	0.4521	LMC
Türkiye	Asia	Western Asia	Very High EGDI	V3	27	0.8913	0.9225	0.8322	0.9192	0.8630	UMC
Turkmenistan	Asia	Central Asia	Middle EGDI	MH	145	0.4757	0.2506	0.5151	0.6614	0.0411	UMC
Tuvalu	Oceania	Polynesia	Middle EGDI	M3	158	0.4042	0.1944	0.4720	0.5463	0.0685	UMC
Uganda	Africa	Eastern Africa	Middle EGDI	M3	150	0.4464	0.6069	0.2299	0.5023	0.4384	LIC
Ukraine	Europe	Eastern Europe	Very High EGDI	V3	30	0.8841	0.9854	0.8428	0.8240	1.0000	LMC
United Arab Emirates	Asia	Western Asia	Very High EGDI	VH	11	0.9533	0.9163	1.0000	0.9436	0.7808	HIC
United Kingdom of Great Britain and Northern Ireland	Europe	Northern Europe	Very High EGDI	VH	7	0.9577	0.9535	0.9747	0.9450	0.9726	HIC
United Republic of Tanzania	Africa	Eastern Africa	Middle EGDI	M3	153	0.4327	0.4791	0.3792	0.4399	0.2877	LMC
United States of America	Americas	Northern America	Very High EGDI	V3	19	0.9194	0.9136	0.9605	0.8842	0.9452	HIC
Uruguay	Americas	South America	Very High EGDI	V3	25	0.9006	0.8832	0.9437	0.8749	0.8630	HIC
Uzbekistan	Asia	Central Asia	Very High EGDI	V1	63	0.7999	0.7648	0.8769	0.7580	0.6986	LMC
Vanuatu	Oceania	Melanesia	High EGDI	H1	129	0.5427	0.4769	0.6165	0.5347	0.4658	LMC
Venezuela, Bolivarian Republic of	Americas	South America	High EGDI	H1	131	0.5360	0.3576	0.5390	0.7115	0.2192	LMC
Viet Nam	Asia	South-Eastern Asia	Very High EGDI	V1	71	0.7709	0.7081	0.8780	0.7267	0.6027	LMC
Yemen	Asia	Western Asia	Low EGDI	L3	185	0.2317	0.1377	0.2905	0.2670	0.1507	LIC
Zambia	Africa	Eastern Africa	High EGDI	H1	130	0.5424	0.4958	0.5088	0.6225	0.4110	LMC
Zimbabwe	Africa	Eastern Africa	Middle EGDI	M3	149	0.4481	0.4100	0.3947	0.5395	0.2740	LMC