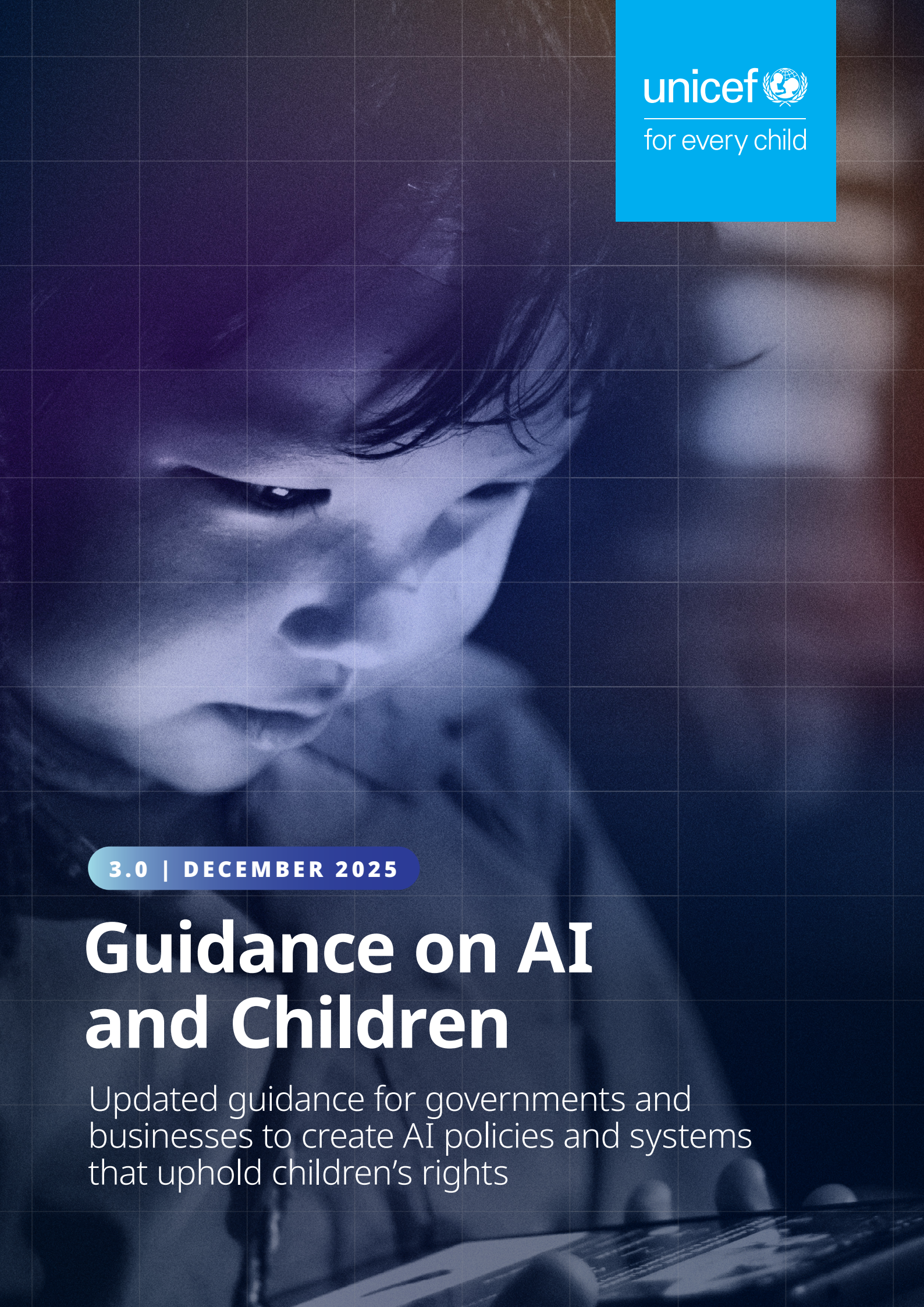

unicef
for every child

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Guidance on AI and Children

Updated guidance for governments and businesses to create AI policies and systems that uphold children's rights

Contents

Introduction

TODAY

Recent data reveals rapid adoption of AI.

67%

of UK teens now use AI

37% of American elementary students learn through AI applications

37% of children aged 9–11 in Argentina turn to ChatGPT for information

Artificial intelligence (AI) is now front and centre in almost every major app or platform that children use. Recent data reveals rapid adoption: 67 per cent of UK teens now use AI (a figure that has almost doubled in two years),[1] 39 per cent of American elementary students learn through AI applications[2] and 37 per cent of children aged 9–11 in Argentina turn to ChatGPT for information.[3] Uptake, however, is not even: UNICEF research (forthcoming) with 12,000 children aged 12–17 and their parents/caregivers found substantial AI usage but wide divides between countries, leading to the exclusion of some children. The little research available on children and AI shows the differences are about more than access – disparities exist in types of usage, attitudes to AI, trust levels, understanding of privacy protections and exposure to harm.

Collectively, these changes bring opportunities and risks to children, young people and their families, teachers and communities. New benefits that could be leveraged include the use of AI systems to better support learning and increase accessibility for children with disabilities. Novel risks include AI-generated disinformation and emotional dependency on companion chatbots. Real harms are experienced through AI-generated explicit 'deepfakes' and AI-generated child sexual abuse material (CSAM), sometimes based on the images of real children. Essential questions remain unanswered, such as what disruption AI systems may cause in children's education, skill needs and future workplaces?

Since 2021, there has been a much-needed uptick in efforts to support and protect children in an AI world. From a governance perspective, these include child-related legal stipulations in the EU AI Act[4] and the Council of Europe Framework Convention on AI and human rights, democracy and the rule of law.[5] Recommendations appear in the Joint Statement on AI and the Rights of the Child, adopted by the United Nations (UN) Committee on the Rights of the Child in 2025 and co-led by the International Telecommunication Union (ITU) and UNICEF,[6] the UN High-level Advisory Body on AI's report[7] and the UNESCO Recommendation on the Ethics of AI.[8] There are also efforts to research and engage children on the topic, notably by UNICEF, the Alan

Turing Institute, the Children's Parliament and the Scottish AI Alliance,[9] as well as by research groups like Digital Futures for Children with EU Kids Online.[10]

Yet, despite children being at the forefront of AI adoption, little is known about the mid- to long-term impact of AI on them; for example, developmental (cognitive and psychological) and learning impacts, as well as impacts on the societies in which they live. In addition, children remain at the margin of shaping AI systems. This is especially true for children from the Global South, for whom location, digital divides and severely limited access to policy forums and AI design processes are exclusionary factors. Even in wealthy countries in the Global North, most children are not sufficiently engaged in such activities. If AI systems are to benefit every child and function in their best interests, children must be urgently and meaningfully included in AI governance and development processes. Particular attention must be paid to those from the Global South, in rural areas, and from marginalized or vulnerable communities.

AI policies and systems should protect children, provide equitably for their needs and rights and support their participation in an AI world by contributing to the development and use of AI.

The notable policy, research and engagement efforts towards child-centred AI listed above are the exception, not the norm. Children's rights are still not receiving sufficient attention in AI policy, law, governance and development.[11] As noted, there is very limited understanding of how this unprecedented technological shift is shaping different children's worldviews, development and futures at large. Further, the growing climate of AI competition and fragmentation between countries creates headwinds for national, regional and global cooperation, resourcing and interoperability – all key for ensuring greater protections and opportunities for children.

The message is clear: in order to uphold children's rights, AI governance and systems need to optimize opportunities, mitigate risks and eliminate harms for children. The need to address the evidence gap on how AI impacts children and their environments, ideally through participatory research and decision-making, and to centre children in AI policies and systems has never been more urgent or important.

This guidance draws on the UN Convention on the Rights of the Child (CRC)[12] to lay out the foundations for child-centred AI: today and in the future, AI policies and systems should protect children, provide equitably for their needs and rights and support their participation in an AI world by contributing to the development and use of AI.

Children should be empowered with access to, and opportunity to benefit from, AI systems. Building on this foundation, the guidance presents ten requirements for child-centred AI, complementing key work already underway, but with a central focus on children.

The guidance is accompanied by many resources, including previous versions, eight implementation case studies, guides for parents and teens, opinion pieces and previous project reports – all available online.

The purpose of the guidance:

- Raise awareness of children's rights and how AI systems can uphold or undermine those rights; and
- Provide requirements and recommendations to uphold children's rights in AI governance and the practices of government and business.

Target audience:

Since most AI policies are devised by government actors, and most AI systems are developed, procured, designed or implemented by governments, State actors and those in the business sector, we have continued to primarily focus the guidance on these two groups:

- Government stakeholders: Including all governance actors at the regional, national or local level who create AI strategies, policies and laws – such as policymakers and legislators – and those responsible for procurement, design, development and/or deployment of AI systems, including government agencies, civil services, law enforcement, standards development organizations and regulators that oversee compliance; and

- The business sector: Businesses that procure, design, develop, deploy or use AI systems, including functions involved in creating policies, guides and codes of conduct for their companies, and teams that implement and monitor them. Although much AI development is concentrated in a few companies, the cross-cutting nature of AI makes the guidance relevant well beyond the 'tech' sector.

In addition, this guidance will hopefully add value to the efforts of other stakeholders in the AI governance and implementation ecosystem, including UN bodies, civil society organizations, non-governmental standards development organizations and academia, all of which are involved in better understanding the interaction of children with AI and the protection of children. For example, civil society organizations may use the guidance to monitor how governments and businesses fare in achieving child-centred AI and publicly hold them accountable.

The guidance can be used in a variety of contexts:

- When creating, reviewing and/or updating AI guidelines, codes of conduct, strategies, policies, laws or regulations, or industry/technical standards;
- When designing, developing and deploying AI systems that children interact with or may be impacted by (even if not designed to be used by children), which includes consideration of the content, decisions and interactions those systems produce;
- When procuring and deploying externally developed systems, which is an increasingly common practice and entails responsibilities and requirements for such organizations;
- When conducting child rights due diligence and, in particular, child rights impact assessments, in relation to AI systems and tools;
- When developing sector-specific interventions, such as new curricula and/or AI-related teaching and learning materials for in-service or pre-service teacher training; or
- When driving change throughout the life cycle of policy and technology development, within governments and companies, especially towards the interoperability of governance mechanisms for child-centred AI.

Civil society organizations may use the guidance to monitor how governments and businesses fare in achieving child-centred AI and publicly hold them accountable.

How the guidance was developed:

The document has been informed by a range of inputs: the guidance of a diverse expert advisory group; an expert consultation with civil society, governments and academia; internal and external peer review; and emergent evidence, including a twelve-country UNICEF study with children and caregivers. This consultative and broad approach ensures the recommendations reflect real-world experiences across regions.

RATIONALE

Why the guidance needed to be updated

This third edition of the UNICEF guidance on AI and children was prompted by rapid advances in AI technologies, such as generative AI, increased adoption of AI systems by children, emergent opportunities and risks with regard to children's rights, and changes in the AI governance landscape. When UNICEF published version two of the guidance in 2021, we noted that AI systems are fundamentally changing the world and affecting present and future generations of children. We observed that algorithms provide recommendations to children on what videos to watch next, what news to read, what music to listen to and who to be friends with. Today, generative AI systems create the videos, news and music. They claim to be the 'friend' of children and present themselves as such. They not only help children learn, they do their homework, potentially undermining the learning and thinking that children need at a crucial stage of their development. These significant changes prompted this updated guidance.

What's new in version 3

The guidance has been updated throughout the document, where needed, with noteworthy additions focusing on:

- AI-generated CSAM and non-consensual intimate images (NCII);
- AI in armed conflict and cyber operations;
- AI companions and 'friends' used by children;
- AI-generated disinformation and harmful content that is highly realistic and persuasive;
- The AI supply chain, including child labour and datasets contaminated with harmful and illegal content;
- The environmental impacts of AI systems, which particularly impact children; and
- The convergence of technologies and fragmentation of policy initiatives increasing the need for the interoperability of digital governance frameworks.

This version aligns with the emerging international child-rights frameworks, processes and instruments of the UN and international community, including those listed above, as well as the UN Committee on the Rights of the Child's General Comment No. 25 (2021), on children's rights in the digital environment;[13] the UN General Assembly's Resolution on the Rights of the Child in the digital environment;[14] the UN Global Digital Compact;[15] the OECD AI Principles,[16] and more.

DEFINITION

What do we mean by AI?

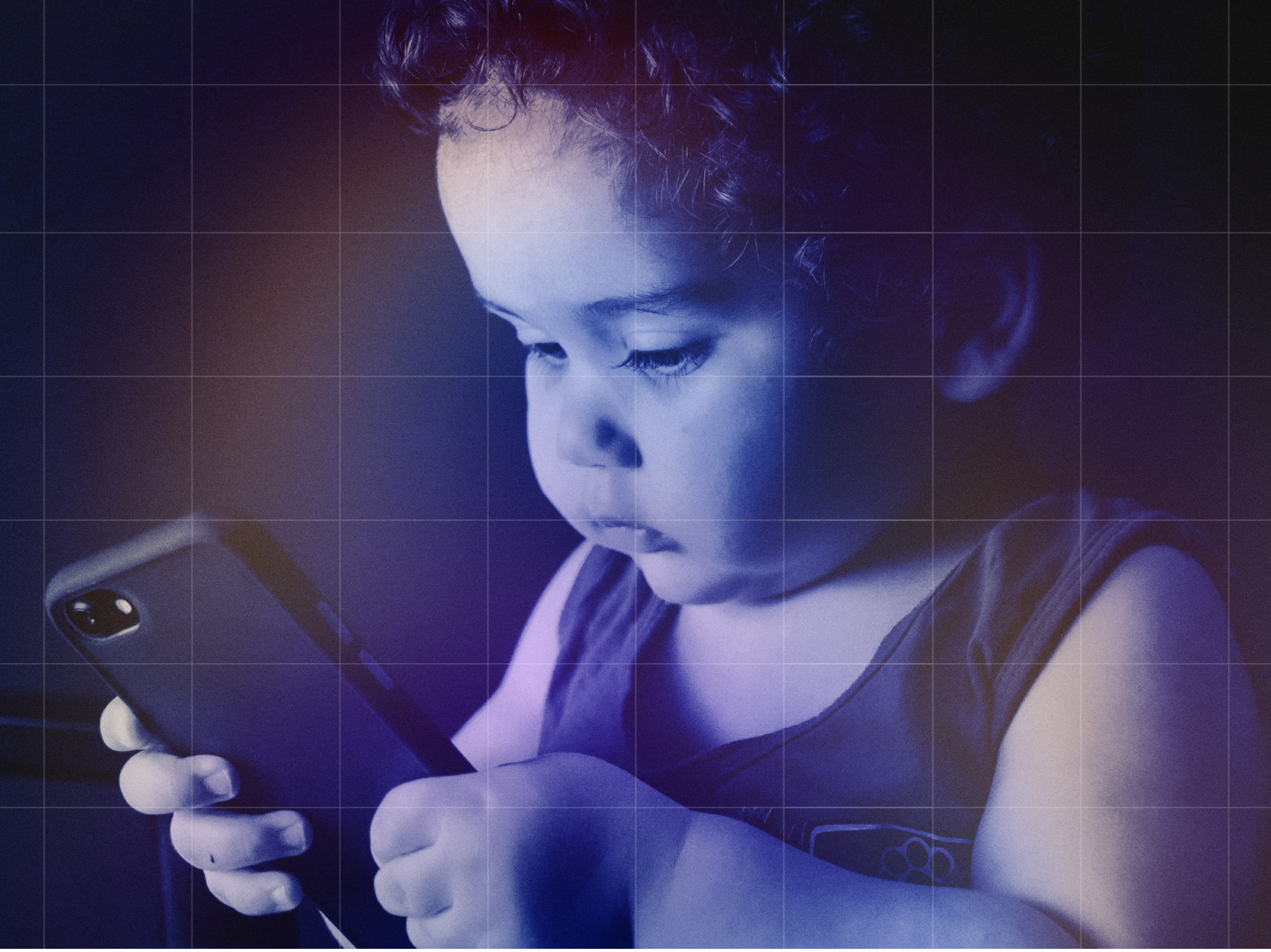
We refer to the OECD definition of AI (updated in 2024):[17]

"An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment."

Simply put, AI systems work by either following explicit rules, learning from examples (through supervised or unsupervised learning) or improving through trial and error (reinforcement learning).

Most AI applications in use today – from recommendation engines to smart robots – rely on machine learning techniques that recognize patterns in data. By detecting such patterns, computers can process text, speech, images or video, and make predictions and decisions, or execute plans. The recent emergence of generative AI and large language models (LLMs) has extended these capabilities: instead of only recognizing and processing data, they can also generate new content by using statistical patterns to predict what comes next in language, images and other media.

For a further explanation of AI use cases and types, please see version two of this guidance.



Foundations for child-centred AI

The rights of children provide the framework for all laws, policies and decisions that affect children. These rights are encapsulated in the CRC, which has been ratified by all but one country. Considering the variety of ways in which AI impacts children, and the related opportunities and risks, the CRC provides the foundation for AI policies, laws, systems and practices to uphold children's rights.[18] The right of every child to be fulfilled applies equally to the digital environment, as highlighted by General Comment No. 25.

States have a duty to protect children's rights, including in the context of AI systems, and businesses have a responsibility to respect these rights both offline and in relation to the digital environment, in a way that is consistent with the UN Guiding Principles on Business and Human Rights and the Child Rights[19] and Business Principles[20] of UNICEF, Save the Children and the UN Global Compact. Child-centred AI means AI that results in the fulfilment and protection of all children's rights – including AI systems that indirectly impact children. All involved actors must recognize that child-centred AI is not optional but part of their obligations to the next generation.

States have a duty to protect children's rights, including in the context of AI systems, and businesses have a responsibility to respect these rights both offline and in relation to the digital environment.

The CRC protects children, and ensures that they are provided for and engaged, recognizing their agency and right to be involved in matters that concern them. Governments, businesses and all other stakeholders should be guided by these principles for all AI-related considerations:

Protection = { do no harm }

Children need to be protected from all harmful or discriminatory impacts of AI systems in the short and long-term, and enabled to interact with them in a safe way. AI systems should be leveraged to actively protect children from harm and exploitation, and prevent adverse impacts – direct and indirect – on them.

Provision = { do good }

The opportunities that AI systems bring to children of different ages and backgrounds, such as their potential to support their education, health care and right to play, need to be fully leveraged when – and this is critical – it is appropriate, safe and beneficial to use AI systems.

Participation = { include all children }

Ensuring participation means that children are given agency and opportunity to shape AI systems, in accordance with their evolving capacities, and make educated decisions on their use of AI and the impact that AI can have on their lives.

I like studying with ChatGPT, can do schoolwork and learning [sic] Malay

CHILD CONSULTATION IN MALAYSIA
Age group 14–17[21]

Because of children's evolving capacities, AI rules and systems should be age appropriate, recognizing the particular protection needs of younger children while empowering adolescents' agency as they mature. In practice, this means treating childhood not as a single user profile but adapting to developmental stages.

When applying this foundation to AI policies, laws, systems design, development and deployment, it is critical to note that regardless of legal frameworks, all children under the age of 18 are entitled to the rights enshrined under the CRC. Reaching the age of digital consent, which begins at 13 years old in many countries, does not mean children should then be treated as adults.

Requirements for child-centred AI

The requirements in this section provide a means of putting into practice the foundations of child-centred AI and the principles of provision, protection and participation. They are intended to provide a clear framework, within which their application can be tailored to specific socioeconomic and cultural contexts while always upholding all children's rights. Given the rapid pace of change in the AI field and the risks the technology poses to children if its development is not guided by children's rights, the urgent application of these requirements is imperative.

To operationalize the foundations for child-centred AI, UNICEF recommends that governments and other authorities, as well as business stakeholders that design, develop, deploy or use AI systems, meet these ten requirements:

1. **Ensure regulatory frameworks, oversight and compliance for child-centred AI**
2. **Ensure safety for children**
3. **Protect children's data and privacy**
4. **Ensure non-discrimination and fairness for children**
5. **Provide transparency, explainability and accountability for children**
6. **Respect human and child rights through responsible AI practice**
7. **Support children's best interests, development and well-being**
8. **Ensure inclusion of and for children**
9. **Prepare and skill children for present and future developments in AI**
10. **Create an enabling environment for child-centred AI**

Below we provide recommendations to help fulfil these requirements. Links to useful resources, toolkits, examples, reports and articles are also included.

1. Ensure regulatory frameworks, oversight and compliance for child-centred AI[1]

States have the primary obligation in ensuring that AI is responsible, such as by requiring a child-rights-by-design approach across the full AI lifecycle.

Public authorities, including governments, parliaments, the judiciary, law enforcement, regulators, social welfare institutions and education ministries, are the essential stakeholders in setting, applying and overseeing child-centred AI governance. States have an obligation to protect children and ensure respect for all their rights. This encompasses the obligation to regulate non-state and private actors whose technological innovations, including AI, impact children's rights, as well as enforcing these obligations. Rather than stifling progress, rights-respecting regulatory frameworks provide a level playing field for innovation. States must take measures to ensure that activities by all stakeholders throughout the lifecycle of AI systems are in full compliance with the protection of human and child rights, as enshrined in applicable and domestic laws.[22] States have the primary obligation in ensuring that AI is responsible, such as by requiring a child-rights-by-design approach across the full AI lifecycle. It is not adequate to simply mention human or child rights in the ethics chapters of AI documents, as is sometimes the case.

Review, update and, where necessary, develop comprehensive AI-related regulatory frameworks to integrate child rights. Governance frameworks, including laws, regulations, standards and ethical guidelines, should be developed, leveraged or adjusted to ensure the full implementation of obligations, including the obligation to ensure respect of all child rights in the design, use, application or commercialization of AI systems by State actors, businesses or any other stakeholders. Given the fast pace of technological change, this is not a one-off exercise, but should be repeated as part of continuous and responsive governance.

Laws and regulatory frameworks should embed safety-by-design, in line with international guidance. A gap analysis based on the current and foreseen opportunities and risks associated with AI should be undertaken to inform the decision of governments to update or develop regulatory frameworks or laws that specifically address the risks associated with children's data, rights and AI.

[1] In order to bring attention to the roles of governments and businesses, the requirement from the previous version of the guidance, "Empower governments and businesses with knowledge of AI and children's rights", has been expanded in two new requirements: this one focusing on the role of government stakeholders, and the "Respect human and child rights through responsible AI practice" requirement, which unpacks the responsibilities of the business sector.

EXPLAINER

The changing role of children in the world of AI

Accountability and safety measures are becoming more critical and complex to govern, as in the AI ecosystem there are now both creators of foundational AI systems as well as those who deploy, modify, embed or code with them. The latter group includes children, who are thus not only AI users or data subjects, but also AI modellers and developers, building systems on top of the foundation models and taking part in the developer accountability governance space.

The role of some children has changed from 'impacted by' AI systems, to creators and deployers of AI tools, and thus part of the regulated parties. Ensuring children's rights are upheld, and that children are empowered to fulfill their responsibilities, such as respecting the rights of others, will be critical when navigating this evolving landscape and children's role in it.

Establish – or assign responsibility to existing – oversight or regulatory bodies to ensure compliance with AI principles and laws and set up support mechanisms for redress. Processes should be established for the timely redress of any harmful impacts from AI-enabled systems in the public or private sectors, with oversight bodies – populated by an interdisciplinary range of stakeholders – ready to receive appeals and continually monitor children's safety and child rights abuses. Such oversight or regulatory bodies may draw on existing regulatory frameworks and institutions, like those for medical interventions, consumer rights, advertising, education and data protection. Existing bodies may provide effective legal and regulatory tools for overseeing child-centred AI if they receive the necessary training and capacity support.

In order to ensure effective understanding of risks to children, audits requested by oversight or regulatory bodies should be required to check for child rights infringements, with the inclusion of independent child rights experts in the design, implementation and evaluation of the audits. These are based on existing functional and legal mechanisms, while also drawing on international technical standards. Regulators and oversight bodies may also consider consulting child or youth advisory panels to ensure that accountability mechanisms truly reflect children's needs. With AI being a cross-cutting technology, coordination among existing bodies and

institutions should be encouraged and driven by frameworks where roles are clearly mapped. Such coordination can support regulatory interoperability and resource sharing to avoid duplication.

Ensure that government AI systems comply with AI-related laws and child rights law. Government IT systems are vast and underpin the functioning of key sectors such as social services, education and healthcare. As these systems become increasingly AI-enabled, it is critical that they are safe, secure and fully in compliance with related laws and codes. When this does not happen, there can be real-world impacts at scale such as discrimination and wrongful accusations in law enforcement, or withholding of benefits in social welfare.[23] As with the business sector, capacity-building on AI and child rights for State actors is critical for them to have awareness and sufficient knowledge of child rights, AI-related opportunities and risks, as well as how to design, develop or buy, deploy and govern AI systems safely and effectively. The importance of responsible procurement is critical,[24] as this will be a common approach to government use of AI systems. When using AI for their own services and products, governments should conduct child rights impact assessments, as a prerequisite for public procurement and deployment of AI tools. The findings should be made publicly available and result in recommendations for amendments, alternatives and improvements.[25]

RESOURCES

Artificial Intelligence Governance in Motion
A rapid global review by UNICEF and TechLegality of AI regulation and its implications for children's rights

2. Ensure safety for children

Children's safety in relation to AI systems must be assured, both in the short and in the long term. The distinct physical, psychological and developmental characteristics of children – recognized in the CRC as the basis for their status as unique rights holders – warrant special consideration in the development and use of all technologies, including AI, which impacts children in distinct ways. If they are poorly designed, developed or deployed without children's rights/best interests as primary considerations, or are misused or illegally used, AI systems can bring a range of significant risks and harms to children, including facilitating sexual abuse or endangering children when used in armed conflicts.

Children use digital services and apps in unanticipated ways, have different perspectives on privacy and security and often develop creative techniques to engage with the digital world.

Further, with their evolving capacities, children use digital services and apps in unanticipated ways, have different perspectives on privacy and security and often develop creative techniques to engage with the digital world. As such, the specificities of children need to be considered sufficiently in every context in which the technology is used.[26] This again highlights the need for children's participation in design, development and governance processes to understand, anticipate and address their unique experiences and needs. The various risks to children can also evolve during different developmental stages and these evolving capacities need to be considered in AI policies, laws and AI systems. 'Red lines' for prohibited AI use cases and those that present a high risk of harm to children are being introduced in AI laws, such as in the EU's AI Act.[27] Such prohibitions must be reviewed on an ongoing basis to address emergent risks.

Mandate child rights impact assessments of AI systems in AI strategies, policies, laws and regulations. As stated in General Comment No. 25, State parties should mandate the use of child rights impact assessments to embed children's rights into legislation, budgetary allocations and other administrative decisions relating to the digital environment. Further, State parties should require companies to undertake child rights due diligence, particularly child rights impact assessments, which should then be disclosed to the public. Mandating of impact assessments very much applies to AI systems, including when they are being assessed for procurement by governments.[28] This would ensure business stakeholders carry out impact assessments and are barred from arguing a plausible assertion of ignorance of threats.

Continuously assess and monitor AI's impact on children throughout the entire AI development life cycle, and disclose results. The AI production chain is increasingly complex, with each stage requiring careful oversight to ensure it upholds children's rights and is driven by a focus on child rights by design[29] – including through responsible data collection and labelling and efforts to develop culturally appropriate foundation models free of harmful biases. Collectively, such measures should include identifying the impact of AI systems on social systems and structures and on the development of children and their cognitive skills. This can be carried out through human rights due diligence across the AI value chain, including, as noted above, child rights impact assessments on AI-enabled systems that can identify both risks and opportunities.[30] Businesses should include robust

disclosure of material child rights impacts associated with AI systems in their reporting (including public financial filings and voluntary transparency reports).[31]

Require testing of AI systems for safety, security and robustness. AI systems need to be constantly tested to ensure they are safe, secure and robust. This may include algorithmic audits, requirements for a human-in-the-loop where automated decision-making for children is concerned, and extra checks on the system's resilience against hacking and cyberattacks. AI agents – systems able to semi-autonomously execute a range of tasks on behalf of users, often based on retained information about the user – require rigorous testing to protect children from malfunction, misinterpreted instructions and privacy breaches. At a societal level, there is a risk of over-reliance and disempowerment in interactions with AI agents,[32] which would have a particularly negative effect on children. When systems act with or on behalf of children, protecting their agency is critical. Safety and ethical certification by independent parties for AI systems that are aimed at, or impact, children is one way for organizations to measure and demonstrate a commitment to child-centred AI.

AI systems need to be constantly tested to ensure they are safe, secure and robust.

Eliminate harms and mitigate risks to children of harmful and illegal content that is generated, disseminated and/or amplified by AI, including mis/disinformation, cyberbullying and scams. General Comment No. 25 is clear that regulatory and industry mechanisms should be pursued by governments to ensure that children are protected from harmful content and can safely access diverse digital content – including AI-generated or disseminated material – in ways that uphold their rights to information, freedom of expression and recognition of their evolving capacities.[41] This can be achieved by governments requiring businesses that affect children's rights in relation to the digital environment to: implement regulatory frameworks, industry codes and terms of service that adhere to the highest standards of safety; maintain high standards of transparency and accountability around the use – including misuse and illegal use – of their systems; comply with relevant guidelines, standards and codes; and enforce lawful, necessary and proportionate content moderation rules.

EXPLAINER

Harmful and illegal AI content

AI can be used to instantly and at low cost create content that can be indistinguishable from human-generated content,[33] and more persuasive in swaying people's opinion,[34] while AI algorithms can facilitate its dissemination. This can include: hate speech; incitement to violence (including gender-based violence); harmful content such as the promotion of eating disorders; medical disinformation that harms children or their parents/caregivers; political disinformation that could undermine democratic processes;[35] content linked to armed conflict affecting children (see below); or a range of scams,[36] such as synthetic voice scams that impersonate relatives requesting money.[37]

Looking ahead, misleading synthetic content can be directed at and/or personalized to individual users and, as a result, is becoming harder to combat with automated and human moderators. With their cognitive capacities still in development, children may be particularly vulnerable to the risks of mis/disinformation,[38] and maintaining online information integrity is critical for upholding their rights.[39] More broadly, AI-generated content that is neither illegal nor immediately harmful, but is of low quality and often inaccurate – referred to as 'AI slop'[40] – can reduce the quality of the information landscape, undermining trust and learning by children.

To complement regulations, governments may co-develop codes of conduct[42] with digital service and platform providers or rely on relevant standards to increase transparency (such as about how and how often their platforms are misused or illegally used), accountability and sharing of best practices to mitigate risks. Entities could be established to monitor the implementation of these codes of conduct and certify companies.[43] Companies should eliminate harm for children and take reasonable steps to assess and mitigate risks to children, from enhancing automated and human content moderation – reversing the current shrinking of moderation and trust and safety efforts – to watermarking AI-generated media. AI system developers should collaboratively develop technical ways to mitigate misuse and prevent illegal use of their systems, such as through developing open standards for content provenance and authenticity.[44] It is important to note, however, that since harmful or illegal AI-generated content will largely violate online platform terms of service, regardless of provenance, there is a need for updated terms and policies that address content harmful to children and appropriate methods to enforce those terms and policies.

Prevent AI-enabled crimes against children such as child sexual abuse and exploitation. Emergent harms to children include the increasing use[45] of AI to create photo-realistic[46] CSAM.[47] This can be carried out with AI models that are often open source and can thus be operated offline, with no or few protective guardrails, and are trained on existing CSAM and photos of children from public social media accounts.[48] Such content presents significant challenges for actual victim identification and protection, contributes to a proliferation of CSAM online and continues to victimize the subjects whose images were used in model training. Other threats are NCII generated with AI (sometimes by children)[49]– often using 'nudify' apps currently available on app stores and disproportionately impacting women and girls – and the rapidly growing crime of sexual extortion directed at children.[50] This crime is often facilitated by AI-generated, explicit and sexually themed content (i.e., 'deepfakes'), which is used to harass and blackmail victims.

Eliminating such harms and mitigating remaining risks requires increased industry transparency and accountability, as well as pursuing technical approaches,[51] including requiring pre-release safety testing for open source models used offline to reduce their misuse or illegal use. Broader efforts should include improving reporting and support mechanisms for victims and survivors (including in schools and communities); strengthened capacity for response, including the ability for victims to get legal redress and support; raising awareness of the issues and risks amongst children and their caregivers, including educating children about responsible AI use towards each other; and strengthening legal protections to address AI-generated CSAM and NCII content, with regard to both companies whose tools are used, and individuals utilizing them for malicious activity. UNICEF has developed a global guide[52] to enhance legislation protecting children from online sexual exploitation. AI and computer-generated content of child sexual abuse and exploitation should also be included in any definition of CSAM, with the means of creation and distribution criminalized.[53]

RESOURCES

UNICEF Legislating for the Digital Age
UNICEF global guide[83] to enhance legislation protecting children from online sexual exploitation

DEBATE

AI friend or foe?

With their ability to mimic human-like interactions, and when created to bolster children's development, chatbots have the potential to promote creativity, support neurodivergence with helpful guidance[54] and even help scaffold interactions of children when reading.[55] However, when not designed for safety, children's well-being and age-appropriate experiences, apps that encourage synthetic or parasocial relationships bring significant risks and apparent harms.[56] Due to their tendency to anthropomorphize,[57] and with their cognitive and socio-emotional capacities still in development, children are particularly vulnerable to forming attachments to dedicated AI companion apps or even general purpose AI chatbots capable of companionship features – such as giving personal and relationship advice. In these interactions, children are therefore more susceptible to manipulation and exploitation,[58] to developing dependent attachments[59] and to disclosing private information.[60] Chatbots can adopt sexualized,[61] child-presenting personas or engage in role-play featuring sexualized children.[62] They can be created easily, including by children, and expose children to: inappropriate interactions (since they have an 'empathy gap' that misses human nuance and understanding[63]); exploitative activities (including commercial); and harmful content and directives such as to self-harm. At an age when children are developing their understanding of social skills such as empathy, adaptability and resilience, interactions with AI chatbots may displace important human interaction opportunities and hinder optimal development. Even general purpose chatbots could, intentionally or not, persuade or manipulate children.[64] Chatbots must be designed and deployed in ways that are safe and in children's best interests.

Address risks from AI-enabled chatbots or companions. AI chatbots must be developed with robust supervised safety training, transparently and explicitly disclose that they are not humans and should never be intentionally designed to create emotional dependency.[65] Guardrails are needed to limit access by younger users. States should consider requiring businesses to implement rights-respecting age assurance mechanisms, where these are necessary and proportionate, to ensure children are protected from harm related to AI. While there may be benefits for children, some AI chatbots used for mental health support or therapy have been shown to provide dangerous responses in crisis-level conversations, inappropriate clinical responses and even stigma toward people with mental health conditions[66] – the use of which by children presents very serious risks.

Guardrails are needed to prevent the use of these chatbots in some cases, or identify and stop interactions based on risky content and behaviour, and redirect children who disclose risk of harm to support resources. In short, there should be built-in referrals for children who may need professional and/or emergency services. Such AI systems should be subject to child safety laws,[67] and any AI system that manipulates or persuades children (unless for lawful practices in the context of medical treatment) must be prohibited – as in the EU.[68]

DEBATE

To ban or not to ban?

Given the harm that companion chatbot interactions can pose to children there have been calls from civil society to ban their use by those under 18. In their testing, Common Sense Media concluded that social AI companions pose unacceptable risks to children.[69] Beyond access restrictions, Common Sense Media recommends AI system developers implement robust age assurance beyond self-attestation, and further research on long-term emotional and psychological impacts on children. Some politicians in the USA have also proposed a bipartisan bill to restrict access to companion chatbots by children.[70] If passed, the bill would ban AI companies from providing AI companions to children, and criminalize companies that knowingly make available to children AI companions that solicit or produce sexual content. Tech companies have in recent months added safety features to chatbots, such as monitoring for self-harm or suicidal language, and added parental controls to limit children's interaction with chatbots.[71] Whether these changes are enough to resist the growing call for banning companion chatbots remains to be seen.

SPOTLIGHT

AI in armed conflict and cyber operations

AI is increasingly being used by armed actors, including in the development or enhancement of weapon systems, such as surveillance and attack drones[72] (with the potential threat of autonomous weapon systems); to underpin military "decision support systems" (for example, to influence targeting); and cyber and information operations.[73] The last category includes AI-enabled content or activities used to recruit children into non-state armed groups or otherwise encourage or facilitate their direct participation in hostilities; AI-enabled mass surveillance and profiling of children;[74] and the use of AI in the military domain for next-generation information warfare and disinformation campaigns, including against children.[75]

Governments should prioritize the development of AI tools that would significantly reduce humanitarian harm in conflict situations, including by preventing child and other civilian casualties.

Protect children from the harmful use of AI in armed conflict and cyber operations. Governments should reinforce normative and legal frameworks to protect children in these contexts, including through developing protective guidelines and tabling the issue of AI usage in discussions on the regulation of cyber-operations in support of multilateral global and regional approaches to protection.[76] On the issue of the military use of AI more broadly, governments should prioritize the development of AI tools that would significantly reduce humanitarian harm in conflict situations, including by preventing child and other civilian casualties.[77]

Further, as the private sector, including digital platforms and infrastructure, becomes increasingly involved in cyberattacks and cyberconflict, heightened due diligence is required to prevent proliferation of AI and AI-related technologies that could be misused in situations of conflict. States should ensure businesses carry out human rights due diligence, especially, but not exclusively, in conflict-affected settings. Further, they should help ensure that businesses operating in conflict-affected areas are not involved with human rights abuses, including by helping them identify, prevent and mitigate the human rights-related risks of their activities and business relationships,[78] particularly security companies and those that deploy AI technologies.[79]

Leverage the use of AI systems, where appropriate, to promote children's safety and support those protecting children. This includes using AI tools that complement human capacities to, for example, identify and disrupt cyberbullying, grooming and exploitation; identify abducted children;[80] detect potential and known CSAM;[81] and detect and block the creation of new, previously uncategorized CSAM and livestreamed abuse. AI could also be leveraged to detect patterns of harmful and illegal content and behaviour, thereby informing choices for safer product design.[82] Beyond detection, AI can be used for enforcement, such as to remove harmful content or disable accounts of offending users, as well as for review of harmful and illegal content. When applied correctly, this can reduce the exposure of trust and safety teams or those in law enforcement to traumatic content. However, as described below, human data labellers and moderators can still be exposed to harmful and illegal content. Further, even with AI tools, human oversight is often needed for a nuanced approach to assessing content and behaviour.

RESOURCES

AI Chatbots and Youth Safety
Outlines key considerations and safety measures for platforms designing social chatbots used by young people, by the Cyberbullying Research Center

Thorn's Safety by Design for Generative AI
Offers actionable design principles to reduce harm and prioritize child safety in generative AI systems

See also the **IEEE Standard (in development) for Safety by Design: Recommended Practice for Using Safety by Design in Generative Models to Prioritize Child Safety (IEEE P3462)**

The risky new world of tech's friendliest bots (UNICEF)
Interview with Samia Firmino about AI companions and children, with recommendations to protect children

3. Protect children's data and privacy

Children's data includes personal identifiers, the content they create, information collected about them and what is inferred through algorithms and other AI systems. For example, in the context of school education, children's data may be processed by AI-driven EdTech, which requires policy considerations to ensure their protection,[84] such as prohibition of behavioural advertising or unauthorized data sharing with third parties. AI policies, laws and systems must be developed to recognize the value and unique vulnerability of children's data and their privacy in a protective way. Therefore, responsible stakeholders, including States and the business sector, must adopt or adapt and implement robust data governance frameworks, including due diligence by those granted access to children's data, as well as redress and/or tangible consequences for harms done through poor data management

Any effort towards addressing data imbalances for children that are less well represented... should not entail large-scale, indiscriminate and wide-ranging collection and processing of their data.

and practices. Children's data and privacy must be protected at all times, regardless of whether they are online or offline. Beyond child data protection regulations, special protections are needed for marginalized groups and for particularly sensitive data, including ethnic, religious or biometric data.[85] Protecting children's data and privacy also includes ensuring that their data or content about them are used only with their informed consent and legally. This means that measures must be urgently taken and implemented to ensure that misleading AI 'deepfakes', AI-generated nude images or videos, or otherwise sexually explicit or harmful material cannot be created or circulated – these are also safety issues, covered in the next section.

Responsibly handle data about and for children. Given that children are a vulnerable group, their data, increasingly including biometric data, should be handled with the highest level of protection. The collection, use and governance of children's data must be proportional (noting again that more data does not necessarily correct bias) to address the inherent tension between the need to use sufficient data about children so that AI systems can best benefit them and the need to minimize data collection to protect privacy and security. Any effort towards addressing data imbalances for children that are less well represented – including children from certain language groups, those living in areas with poor connectivity, children on the move or without formal identification and legal recognition, or children with disabilities – as explained above, should not entail large-scale, indiscriminate and wide-ranging collection and processing of their data.

Adopt a privacy-by-design approach. Governments and businesses should explicitly address children's privacy in AI policies and laws, which must then be applied in the design, development and deployment of AI systems. For instance, decision-makers and developers should adhere to the principles of purpose-specific and minimal data collection and processing to respect children's privacy. Similarly, there should not be 'invisible' data processing (web tracking, data harvesting from public sources, data shared for secondary purposes, etc.). Children's data can also be kept for the shortest period feasible, so that data collected from/about a child does not follow them into adulthood.

Supporting children's ability to maintain agency over their personal data is crucial, particularly with regard to their capacity to access, securely share, understand the use of, control and delete their data, in accordance with their age and maturity.

The protection of children's privacy and data is intricately interwoven with their right to freedom of expression, access to diverse information and protection from commercial exploitation, including through profiling and digital marketing.[86] As specified in General Comment No. 25, and very much applicable in the age of AI, State parties should prohibit by law the profiling or targeting of children of any age for commercial purposes, and practices that rely on neuromarketing or emotional analytics should also be prohibited from engagement directly or indirectly with children.

Protect groups. Profiling is no longer only tied to an individual, but to collections of individuals based on a wide range of characteristics, such as their ethnicity, religion, location, online behaviour and age. Risks from the profiling of groups, as opposed to individuals, play out at scale. There is a need to not only protect an individual's right to privacy – the default regulatory and practice position – but to also take a collective view so that group characteristics, such as cultural or linguistic diversity, are protected. Profiling and responsible data practices should thus also apply to the data of collective groups through the establishment of clear policies, procedures and responsibilities for mitigating group data risks.[87]

Promote children's data agency. Data is the substrate for AI: its training and processing relies upon it. Children's control over their data therefore influences AI impacts. Supporting children's ability to maintain agency over their personal data is crucial, particularly with regard to their capacity to access, securely share, understand the use of, control and delete their data, in accordance with their age and maturity. For this, age-appropriate terms of use and redress avenues are necessary. Given that the responsibility for data protection can never be left entirely to children, UNICEF calls for an overall shift in responsibility from children to companies and governments.[88] Other responsible stakeholders include their wider social ecosystem, such as parents and caregivers – who need to provide consent for the use of younger children's data – as well as educators and social workers, in some cases. These stakeholders should also engage with children in making choices with what (minimized) personal data is processed.

RESOURCES

Responsible Data for Children (RD4C)
An initiative by UNICEF and the GovLab to provide guidance, tools and leadership that support the responsible handling of data for and about children

Data Governance for EdTech: Policy Recommendations (UNICEF)
Policy recommendations on how to apply sound data governance principles within the EdTech sector

Moreover, as children's understanding of consent changes, the process of giving consent should be revisited at key developmental stages in the life of a child. Children should also have a right to withdraw their data from training datasets, or any other datasets used to inform AI systems. Governments should deploy legislation, and companies accessible technical solutions, to enable this.

4. Ensure non-discrimination and fairness for children

No AI system should discriminate against children on any basis, including ethnicity, race, gender identity, disability, rural or urban context, socioeconomic status or location. Certain AI systems are designed for specific age groups – this is not age discrimination but age appropriateness. The promotion of equal opportunities and fairness for every child must underpin the policies and development of AI systems.

Not all children face equal circumstances and therefore not all will benefit alike from one-size-fits-all AI interventions.

Actively support children in disadvantaged or vulnerable situations so that they may benefit from AI systems. Not all children face equal circumstances and therefore not all will benefit alike from one-size-fits-all AI interventions. Responsible AI means recognizing that there is no such thing as a 'universal' childhood or youth experience.[89] With the goal of achieving equal opportunities and protections, AI policies, laws and regulations must particularly protect and support the most vulnerable children, including: girls; children from minority or indigenous groups; children with disabilities; those who speak languages not prioritized by commercial markets (sometimes referred to as 'low-resource languages'); those on the far side of the digital divide (who don't enjoy meaningful connectivity or have low digital literacy); and those in refugee and humanitarian contexts. Some children and groups are particularly at risk of exclusion: an intersectional analysis is important to ensure that they are protected and supported according to their specific needs. Achieving this shared benefit requires attention to the differences in cultural, linguistic, social and regional contexts of AI-related policies and activities, and developing low/no connectivity AI solutions. Further, efforts may include capacity-building projects by governments and other stakeholders for developers of AI policies, laws and systems in order to effectively promote the inclusion of children in disadvantaged or vulnerable situations, who will then be able to benefit from AI that is offered in local languages and is appropriate to diverse contexts.

Reduce prejudicial bias against children, or certain groups of children, which leads to discrimination and exclusion. A key barrier to scaling AI models is the limited availability of high-quality data with adequate data governance structures,[90] and children are disproportionately affected by this given the extra precautions involved in responsibly collecting and disseminating their data. To address this barrier, data equity and representation of all relevant children for a particular AI system, including children from different regions (including rural communities), ages, socioeconomic conditions and ethnicities, is essential to protect and benefit children. For example, in the case of data-driven health care, children's treatment or medication should not be based on adults' data since this could cause unknown risks to children's health.

Dataset descriptions should be explicit about any limitations regarding the representation of children and other relevant demographics.

Further, it is well known that most AI training data and data used to inform AI-generated responses (e.g., in retrieval-augmented generation systems) is from the Global North, which can lead to AI systems that are not representative of, or biased against, children in the Global South. However, the need for representative datasets must never justify the wholesale, irresponsible collection and processing of children's data. Dataset descriptions should be explicit about any limitations regarding the representation of children and other relevant demographics. In some cases, limited data may be necessary, for example, specific medical research that only includes data relevant to serve the study's purpose. Data should be tested for equitability and representativeness, and also for accuracy, consistency, validity and quality. In addition, algorithms need to be programmed, continuously tested and adjusted as needed, to seek fairness in results.

It is important to note that while data is certainly part of the solution, simply including more data from more children does not solve the risks of bias and harm of discrimination. Data can itself be coloured by inherent biases in the way it was collected or labelled. In some cases, more data has further ingrained biases in AI systems. In addition to responsible and accurate data handling processes, biases are holistically addressed by adequate representation and inclusion in the design, review and decision-making processes when developing AI systems.

5. Provide transparency, explainability and accountability for children

While many AI systems indicate that their outputs may be inaccurate or biased, such systems need to be more explicit and transparent about this risk, and seek ways to reduce biases, inaccuracies and hallucinations.

The purpose and potential impact of AI systems should be easily understood by a range of stakeholders, including child users and their parents or caregivers, so they can make informed decisions about whether to use such platforms. However, it is not sufficient to simplify the language used to explain how and why a system made a particular decision, or acted the way it did, such as in the case of chatbots or embodied AI systems like robots. Transparency about the aims and motivations underlying AI policy and system development processes is also needed as a means to better inform parents and caregivers who provide consent for their children to use the systems, as well as a way to hold policymakers, regulators, businesses, designers, developers, implementers and procurers of AI systems accountable for the actions and impacts of such products.

To avoid a situation where children and their caregivers think they are interacting with a human, AI systems should immediately and transparently provide a warning before starting an interaction, explaining in a clear and forthright manner that they are about to start interacting directly or indirectly with an AI system. This is especially important as AI chatbots and companions become more popular. Children and their caregivers must be explicitly alerted in a language that is unequivocal and clear before an AI system is launched and should be provided with informed consent to continue. Consent cannot be implied or assumed from it being previously given. While many AI systems indicate that their outputs may be inaccurate or biased, such systems need to be more explicit and transparent about this risk, and seek ways to reduce biases, inaccuracies and hallucinations.

Explicitly address children when promoting explainability and transparency of AI systems, and prevent anthropomorphizing such systems. Even though the requirements of explainability and transparency are included in most recommendations for ethical and trustworthy AI, it is important that they are aligned with children's needs, understanding and evolving capacities. In doing so, it's important to prevent anthropomorphizing the tools by not describing, marketing or branding them as human-like, and teach children to develop accurate mental models of AI systems as data-driven applications rather than sentient machines.

RESOURCES

IEEE Standards for age appropriate design, ethical design and procurement of AI systems
Standards, frameworks and processes for age-appropriate design (2089), online age verification (2089.1), procurement of AI systems (3119) and more. The CertifAIEd certification program supports individuals and organizations with the knowledge and tools to uphold ethical standards in the creation and implementation of AI systems.

Use age-appropriate language to describe AI. A child who interacts directly with an AI system (e.g., a toy, chatbot or online system) has the right for explanation at an age-appropriate level and in an inclusive manner, including through the use of animations, to understand how the system works and how it uses and maintains data about that child. Requirements of explanation, transparency and redress also apply to AI systems that impact children indirectly.

Design, develop and deploy AI systems so that they protect and support child users according to legal and policy frameworks, regardless of children's understandings of the system. Humans must control and check any recommendations made by AI systems concerning key decisions that impact children, and the final decisions must be made by humans. Examples of such decisions include medical diagnoses, placement decisions, school applications, or redress decisions. Protection functions, such as chat moderation, also require human intervention and control in the loop. Children and their caregivers should be notified that AI systems have been used to make recommendations in decision-making processes that affect children. Accountability around AI systems must include child-friendly mechanisms to report potentially harmful features or activities of the AI system and provide transparent redress and support for children.

6. Respect human and child rights through responsible AI practice

The impact of the business sector, including technology companies, on AI policy and practice is powerful. Businesses' child rights responsibilities complement States' duties. As AI presents new risks – and opportunities – for children, existing standards of responsible business conduct, including the UN Guiding Principles on Business and Human Rights and the Children's Rights and Business Principles, should be upheld and applied in AI contexts.[91] Every company that is operating in the AI value chain, from those that provide materials and infrastructure, to those that design, develop or host AI systems, to those that deploy or use AI technologies, has a responsibility to

respect children's rights. Other actors in the industry ecosystem, including investors, have an important role to play in shaping responsible business conduct within the AI field.[92]

Aside from being a company's responsibility and often legal obligation, child rights-respecting AI can create a competitive advantage and long-term sustainable value.

Human rights due diligence and, in particular, child rights impact assessments, as described above, are vital instruments for practicing responsible and rights-respecting AI. This includes providing remedies in relation to business-related child rights abuses involving AI, which requires additional considerations and measures to address the heightened barriers children face in accessing justice.[93] Beyond their own practices, technology companies should engage in multi-stakeholder cooperation, offer resources to support responsible AI, and share best practices about approaches and lessons learned. Aside from being a company's responsibility and often legal obligation, child rights-respecting AI can create a competitive advantage and long-term sustainable value.

Ensure respect for children's rights across all digital business activities involving AI. While businesses must obviously comply with all laws, including those regulating AI[94] and those otherwise relevant to AI, for instance covering risks associated with content (child online protection), contact and conduct (moderation), contract (personal data protection) and supporting technology (cybersecurity and product liability), businesses should seek to fully support children's rights with AI, rather than be limited to minimum compliance with codes or laws.[95]

The quality of AI systems is largely dependent on accurately labelled and annotated training data, much of which is prepared by human workers, including children.

Ensure a rights-based AI value chain for all inputs ranging from data to hardware and eliminate child labour and exploitation at all stages. The scope here covers a business's own operations – such as activities and product lines – and its business relationships, including all stages of the value chain.[96] An example in the context of AI is that the quality of AI systems is largely dependent on accurately labelled and annotated training data,[97] much of which is prepared by human workers, including children.[98] Often based in developing countries, they may be asked to review harmful and illegal content in working conditions that are low paying, stressful, unpredictable, unrecognized and shrouded in secrecy,[99] bringing into question whether this constitutes ethical and decent work, even for adults.[100] An aspect to consider is the content of training datasets itself, which may be problematic: for example, datasets that train public models have been found to contain CSAM.[101] Yet another aspect concerns mining practices for critical minerals

used in the hardware underpinning AI systems, which must be equitable and just, and not linked to environmental degradation.[102] The value chain includes many stakeholders, such as the private company providing security so that the mining can occur. It is critical that the entire value chain is considered to be rights-based.

Businesses need to ensure child rights are respected throughout every part of the AI value chain.

These examples are not exhaustive and, overall, all AI value chain practices – both upstream and downstream, and considering human and material inputs – need to be rights-based and free of abusive practices and illegal content. No child should be employed in hazardous or exploitative conditions to enable AI systems. Governments should require audits and enforce labour laws and standards – including punitive measures, when needed – in the AI value chain, guaranteeing that the creation of child-centred AI never infringes on the rights of any child involved upstream or downstream. Businesses need to ensure child rights are respected throughout every part of the AI value chain. Given that some AI system components are being, or have been, built on harmful practices or unethical data sources, government and corporate policies should require only engaging with responsible suppliers. Responsible approaches should reflect both current practices as well as appropriate response and redress for any past concerns.

Ensure capacity-building on AI and child rights for top management and those in the AI life cycle, including designers, developers and researchers, and commit to action. Relevant stakeholders within organizations should have awareness and sufficient knowledge of child rights, AI-related opportunities for children's development, the potential risks and harms of AI for children, and, where appropriate, the use of AI for respecting and supporting children's rights and contributing to the achievement of the Sustainable Development Goals (SDGs). Such knowledge is necessary to implement a child rights-based approach in accordance with national and international human rights laws, codes and child-rights frameworks, and to govern, design, develop, deploy or monitor child-centred AI.

It is critical that knowledge of the opportunities and risks around AI and children is translated into action. The aim is for organization-wide awareness of child rights issues around AI that is supported by a commitment to child rights-respecting AI from company leadership, so that when human rights, development or other teams raise red flags, they are acted upon.

RESOURCES

UNICEF Assessing child rights impacts in relation to the digital environment
Introduces Digital Child Rights Impact Assessments (D-CRIAs) to help organizations identify and address risks to children in digital environments, toolbox included

UNICEF Disclosure Recommendations on Child Rights Impacts in Relation to the Digital Environment
Guidance for companies on reporting child rights impacts linked to digital products, services and operations

Children & AI Design Code
A framework to guide the responsible development of AI systems with children's rights and best interests at the forefront. The code outlines practical steps to identify, assess and mitigate AI-related risks to children, by 5Rights Foundation

Taking a Child Rights-Based Approach to Implementing the UN Guiding Principles (GPs) in the Digital Environment
Explores how businesses can align with the UN Guiding Principles while addressing children's rights in digital contexts (B-Tech)

Human Rights and Generative AI
Assesses risks across the generative AI value chain and provides practitioner guides for responsible AI development, by BSR

If necessary, such actions should involve discontinuing the development of AI systems or certain features.

Capitalize on customers' demand for trusted and transparent AI solutions for children. Businesses that invest in safe, responsible and ethical AI systems designed for children can strengthen their existing corporate sustainability initiatives, while ensuring benefits for their business by integrating respect and support for children's rights into their core strategies and operations.[103] As consumers and the wider public make greater demands for technology services to have the right safeguards in place, businesses should capitalize on this market opportunity[104] and thereby also mitigate against corporate reputational risks for AI-related harms. Building on the need to focus on and engage children allows companies to better understand their needs, concerns and ideas. The results are safer and more relevant AI systems – thus directly helping to maintain public trust in AI and enable confidence for R&D and investments – and delivering beyond minimum compliance with codes and laws. These actions are the right thing to do and also make solid business sense. It is critical, however, that safe and responsible AI practices are not only for children who can afford them. Such approaches, like alerts to a child when they encounter an AI system, need to be the default in all products and services, including those that are free.

7. Support children's best interests, development and well-being

When applied responsibly and to uphold children's rights, AI systems have the potential to support every child's right to grow up in a safe and nurturing environment, allowing them to reach their full potential while serving their best interests.[105] But such benefits to children should be validated with evidence, impact assessments and research. This is especially key when AI systems are adopted system-wide, for example, on social media platforms or in schools. Further, whether AI systems are deployed responsibly and are beneficial to children is not a one-off assessment; it should be regularly reviewed.

AI systems should support the development of independent cognitive and socio-emotional abilities and not hinder healthy development through over-assistance, automation or displacement of experiences that support children's growth.

When moving from policy to practice it is necessary to acknowledge and try to address the engagement of seemingly competing rights.[106] In situations where children's rights may compete, States should follow due process to assess and determine what is in children's best interests in line with guidance in the CRC and its General Comments, and companies should aim to ensure that all rights are respected.[107]

It is important that the principle of the best interests of the child be interpreted through a contextual and intersectional lens, recognizing that children's needs and vulnerabilities differ across regions, cultures and socio-economic realities. Applying a one-size-fits-all standard – particularly in the rapidly evolving field of AI – risks imposing ill-fitting solutions on some children. AI systems should support the development of independent cognitive and socio-emotional abilities and not hinder healthy development through over-assistance, automation or displacement of experiences that support children's growth.

Prioritize how AI can benefit children, in particular in AI policies, laws and systems. AI policies and strategies often largely regard children as a future workforce needing to be trained.[108] They must rather take a holistic approach to children's developmental opportunities, informed by a sound knowledge of the impacts of AI on children, including the unique developmental and well-being benefits and, more importantly, the risks associated with AI systems for children. The benefits should be leveraged and given support in strategies, policies and laws, along with actions to mitigate risks and eliminate harms.

To enable this, evidence, AI governance and deployment should be mutually reinforcing, with dynamic feedback loops between research, regulation and lived experience, especially of children. Guardrails are a necessary starting point, but they must be complemented by continuous learning, adaptive governance and investment in child-centered AI design and foresight.

Develop and apply a child rights-by-design approach. This requires a serious commitment to putting the child at the centre of AI policy and system procurement, design, development, deployment and adoption. To do this, AI technologies should be created based on a child rights approach, which is inclusive of privacy by design and safety by design.

Integrate metrics and processes to support children's well-being in the use of AI.[109] Interaction with, and impacts from, AI systems should support children's well-being. Ideally, AI systems should be designed to improve the many well-being facets of a child, such as their creativity, competence and autonomy. Without such an intentional approach, the concerns of some parents and teachers that the use of AI may negatively impact children's well-being[110] could be realized. Since children will increasingly spend a large part of their lives interacting with or being impacted by AI systems, developers of AI systems should tie their designs to well-being frameworks[111] and metrics – ideally ones focused on and researched with children specifically – and adopt some measure of improved child well-being as a primary success criterion for system quality. This is especially relevant in the context of children due to their protracted development and the importance of environmental experiences in shaping their skills, behaviours and perceptions.[112]

Ideally, AI systems should be designed to improve the many well-being facets of a child, such as their creativity, competence and autonomy.

A well-being framework must integrate a holistic understanding of children's experiences, and includes material, physical, psychological and social factors, among others. Governments, policymakers, businesses and developers, working with child well-being experts, should identify appropriate metrics and indicators, and design processes that account for the changes in children's well-being. This includes efforts towards increasing awareness of the importance of well-being, and developing processes for integrating well-being considerations into design parameters, data collection, decision-making, roles and responsibilities, and risk management.

RESOURCES

Responsible Innovation in Technology for Children (RITEC)
This research project by UNICEF, the LEGO Group and partners, and funded by the LEGO Foundation, shows how games can be designed to support children's well-being. Its well-being framework can be applied to AI systems, as has been done by the Alan Turing Institute with children in the UK

RITEC Design Toolbox
Provides designers of digital play with practical tools for incorporating support for children's well-being into their design process

Draft Study on AI and Human Rights in Africa
A draft report by the African Commission on Human and Peoples' Rights on the human rights implications of AI on the African Continent

Address negative environmental impacts from AI and digital infrastructure. Children bear the greatest burden of climate change,[113] which makes the environmental impacts of AI and the broader digital transformation particularly problematic. These impacts derive from the use of natural resources, including water consumption to cool data centres[114] (especially those built in already water scarce areas, which can have a disproportionate impact on local communities[115]), mining of critical minerals and harmful health impacts associated with prenatal and childhood exposures to e-waste toxicants, especially during the recycling process.[116] With the current approach, the computational infrastructure required to store data, train AI models and generate results requires high energy consumption[117] and emits carbon dioxide.[118] AI infrastructure and usage can thus contribute to the violation of children's right to a clean, healthy and sustainable environment.[119]

Addressing these negative impacts requires transparency about AI's real environmental impact, the meaningful participation of affected communities, and public and corporate accountability for negative impacts from AI infrastructure. Transparency entails reporting the environmental impacts to end users, in terms and metrics that children can understand.[120] Mitigating actions include developing smaller or more energy-efficient AI systems, avoiding AI where less energy-intensive solutions are appropriate, optimizing data centre energy efficiency and utilizing renewable energy sources – practical steps by industry that could be required or incentivized through regulation or voluntary measures, as AI-related policies and broader environmental regulations are weaved together.[121]

Leverage AI systems to support and increase environmental sustainability, including by ensuring a sustainable AI value chain. On the positive side, if deployed in ways that do not have negative environmental impacts, AI systems can and should be used to help combat climate change – for example, through better modelling its impacts and mitigation

strategies.[122] AI systems may in the future contribute to environmental sustainability, such as through enabling the design of new materials for batteries and alternative cements that could lead to emission reductions, reducing pollution in cities through optimizing traffic flows and enhancing agriculture through better weather predictions and precision agriculture. These potential benefits would all contribute, directly or indirectly, to children's health and well-being and should be bolstered through research and development investments.

8. Ensure inclusion of and for children

When developing AI policies, laws and systems, inclusive approaches that address the widest possible range of users should be applied so that children can benefit from AI and use AI products or services, regardless of their gender identities, abilities or other characteristics. Active participation of children in the governance of AI policies and in the design, development and implementation of AI systems is a necessary precondition for child-centred AI.

Meaningful participation implies more than inclusion; it demands influence.

Support meaningful child participation, both in AI policies and governance, and in design, development and deployment processes. In accordance with children's rights under article 12 of the CRC, their participation is essential when an AI system is intended for children, or when children may use the system (even if it is not explicitly designed for them). The latter scenario happens easily when there are no effective access restrictions or safeguards in place to prevent child users from accessing AI systems intended for older age groups. Child participation is also essential if the system impacts children or is likely to impact children, even if they are not direct users.

Participation is meaningful if it is ongoing, rather than a tokenistic one-off effort. It must be safe, inclusive, distinct from market research or AI user testing and delivered in ways that align with children's evolving capacities (thus allowing for younger and older children to engage). Finally, but critically, children's inputs should be given due weight and seriously taken into account.[123] In this way, meaningful participation implies more than inclusion; it demands influence. There should be clear mechanisms through which children can influence decision-making and effect change. This is particularly critical for children from the Global South, who have the least representation in global AI deliberations.

RESOURCES

Exploring Children's Rights and AI
The Children's Parliament, Scottish AI Alliance and the Alan Turing Institute explore how children interact with AI, and how they can become meaningfully involved in AI development and policy

Being heard: Shaping digital futures for and with children
A collection of methodologies for meaningfully consulting children about the digital environment, including by using digital technologies (London School of Economics and Political Science)

UNICEF Guidance: Stakeholder engagement with children in digital child rights impact assessments (D-CRIA)
Provides practical steps for engaging children and ensuring their voices inform digital policy and product decisions. This resource is part of the D-CRIA toolbox, referenced above

The resources to the left provide practical guidance on how to ensure meaningful child participation.

Methods of participation include having child/youth representation in AI governance mechanisms, children/youth being embedded in co-creation and design activities, undertaking participatory research with children and ensuring stakeholder engagement with children by companies that design, develop or deploy AI systems, when conducted under the necessary conditions.[124] In order to avoid having children 'rubber-stamp' already developed systems, their participation must happen throughout the AI life cycle, starting with ideation and design. The result of meaningful child participation will be AI policies, laws and systems that resonate with children's lived digital experiences and which better serve their best interests and needs.

Adopt an inclusive design approach when developing AI products that will be used by children or impact them. An inclusion-by-design approach ensures that all children can use AI products or services as appropriate for their age (often 13 years or older), regardless of their gender identity, ability, neurodiversity, nationality and geographic and cultural diversity. An estimated 240 million children worldwide live with disabilities;[125] including them in AI design will create more accessible systems for all and help ensure relevance for and use by children that may otherwise be excluded through bias, discrimination or profiling. AI systems should be leveraged to support accessibility efforts, such as to make the production of accessible learning material more efficient and cost-effective. An example is the Accessible Digital Textbook initiative that utilizes AI to include narration, image captioning, text simplification and more in learning materials to make them more accessible to all children, including children with disabilities.[126]

Strive for diversity amongst those who design, develop, implement, research, regulate and oversee AI systems that children may use or be impacted by, including those collecting and processing AI data.

Including a broad range of stakeholders in AI teams, such as parents, teachers, child psychologists, child rights experts and children themselves, will further the goal of inclusivity. With diverse teams, biases can be reduced and a broader range of perspectives, including those of disadvantaged or minority groups, are more likely to be considered and actively included. Diversity includes not only different voices, but also informed ones. In the same way that children should be AI literate, the creators of AI systems should be child-rights literate.

9. Prepare and skill children for present and future developments in AI

The promotion of AI literacy and related skills as a part of education is one way to help children understand the AI systems and devices that are increasingly part of their lives.

AI holds much promise to support teaching and learning. The promotion of AI literacy and related skills as a part of education is one way to help children understand the AI systems and devices that are increasingly part of their lives. Further, this will help to prepare them as users and potential developers of AI and will support their engagement with changing job markets and the digital environment more broadly. However, skills are just one part of a holistic approach needed to create an inclusive and equitable AI-in-education ecosystem, which spans infrastructure, appropriate content, safe and effective EdTech solutions, and AI models that are locally and culturally relevant to all children, wherever they are.

Amid the promise of AI to support education, it also challenges it. How should AI software be used for children's homework, and how should such assignments be structured to be a valid form of assessment? As some schools and education systems increasingly incorporate AI systems into the teaching and learning process, how will this impact the traditional role of teachers? When homeschoolers turn to AI systems, how is the supportive role of a parent or caregiver changed – particularly when AI outputs differ from those of human perspectives? Questions around assessment, what and how to teach children, and the roles of teachers and parents/caregivers will need to be addressed by many stakeholders in the learning ecosystem to navigate the changes introduced by AI.

Develop or update formal and informal education programmes for AI literacy and strengthen life skills and technical skills needed to flourish in an AI world, including in the future workplace. Children must be actively supported to develop life skills, also known as transferable

skills,[127] such as critical thinking, problem solving, working with others and socioemotional skills, to help them thrive, be resilient and adapt to a changing world. Given the increased usage and potential benefits of AI systems for learning, children should be supported to develop skills for self-sufficiency to avoid over-reliance on AI systems[128] or the potential diminution of critical thinking skills overusing those systems might bring. In particular, they can learn strategies for using AI as a complement to, rather than a substitute for, their own input and abilities. Promoting AI literacy in this way would include providing knowledge of basic AI concepts (for example, what it is and what it is not), data literacy, and attitudes and values to understand the ethics and responsible use of AI. Increasingly, AI literacy should include knowledge about the environmental impacts of AI usage, as well as creative and academic integrity considerations, for example, around plagiarism and copyright.[129] On the last point, it is difficult for adults, including caregivers, to understand the evolving interaction between intellectual property laws and AI systems. To help children share in AI-related dividends, operators of AI systems should make clear to children the acceptable AI uses and opportunities to fairly protect, use or share their intellectual work.

You take [your assignment], throw it in the chat, the chat creates your writing. Did you learn to write? Did you learn to make sense?

CHILD CONSULTATION IN BRAZIL,
Age group 14–17

AI literacy, which is currently not very common in digital curricula, should also involve educating children on their rights as users and the limitations of AI technologies – such as that companion apps are not real or capable of human emotion – so that they can become safe and *conscious* users of AI-based systems. Children must learn about the risks associated with some AI systems, ranging from prejudicial bias to what researchers call "emotional manipulation".[130] Collectively, AI literacy can help children make active and informed decisions about when they do want to use AI, or when to object to uses of AI that impact their lives. Children should have the ability to opt out of using AI systems without compromising their educational opportunities. Special attention should be given to ensure girls are included in AI literacy programmes, given they may be underrepresented in such programmes due to gender-related inequalities; for example, restricted digital access or limited parental support to develop digital skills. Overall, AI literacy training, as a complement to other literacies, such as media and information literacy, should help learners use the tech responsibly and equip them with the qualities necessary for digital global citizenship,[131] which can have a positive impact on individual well-being and the pursuit of the common good in society.

Train, equip and support teachers on AI to put them at the centre, not replace them. To improve children's digital literacy and awareness of the impact that AI systems can have on their lives and on society, their teachers must be trained on these skills as well. Teachers are the face of the education system and it is essential that they are continually skilled, upskilled and reskilled to teach digital and AI literacy. This includes recommending and utilizing the most appropriate tool (AI or otherwise) for particular tasks. Teachers must be trained to support children to think critically and safely navigate the digital environment, and to leverage AI systems in their own daily work and professional development.[132] With the unprecedented advent of generative AI systems that can simultaneously provide to children mathematics tutoring and relationship advice, teachers need to instruct children not only about the educational uses of AI systems, but also about risks of hallucinations and to children's safety and psychological well-being when using such AI systems.

Teachers are the face of the education system and it is essential that they are continually skilled, upskilled and reskilled to teach digital and AI literacy.

While AI holds potential to assist teachers, it is critical that they are equipped with the knowledge, guidance and institutional support regarding when not to use it. AI should not be used for critical functions and decision-making where a human needs to be in the loop, such as providing socioemotional support to students or some types of student assessment, including high-stakes summative assessments. Outsourcing key functions to AI risks undermining children's right to quality education and disempowering teachers. A national self-assessment for teachers to evaluate and then access training opportunities so that they can continuously develop their digital and AI skills could be a useful start to teacher-support programming. Teachers should be given the time to undertake the training needs outlined above. Beyond skills and effective use, AI and digital technologies should be leveraged to support teachers, such as to improve their working conditions and increase recruitment and retention.[134]

Provide guidance to teachers, schools and education departments to effectively procure and deploy AI and mitigate the risks.[135] AI-enabled EdTech is being taken up in formal and informal learning settings, yet such products and services may lack proven efficacy and the necessary and robust safeguards to protect children's data and privacy[136] and prevent undesirable outcomes. These include when AI systems generate false, narrow or biased learning material or feedback[137] that can reinforce inequalities and limit students' worldview, or when AI systems enable plagiarism by children.

RESOURCES

EdTech for Good Framework and the Learning Cabinet
Public good resources to identify, assess and match safe, impactful and scalable EdTech tools to the needs of learners

UNESCO AI competency framework for students and for teachers
Provides guidance to curriculum developers

An AI Literacy Framework for Primary and Secondary Education
A joint OECD–EU initiative providing a draft framework outlining core competences, practical classroom scenarios and tools for policymakers and teachers (Teach AI)

UNICEF's AI-powered production of accessible digital textbooks
Pilots and scales digital textbooks with text-to-speech, sign-language video, adjustable fonts and interactive features to support inclusive learning for all children, including children with disabilities

UNICEF Superstar Teachers Toolbox
A set of practical resources designed to empower educators in the digital age, including on AI

In other instances, when AI is used to analyse learners' data, checks need to be in place to ensure that the results don't limit children's opportunities or have a stigmatizing effect by excessive or incorrect diagnoses of learning ability or types. Neurodivergent children or those from minority groups are especially at risk as AI systems may not have been trained to recognize their traits.

Teachers, schools and education departments that source and implement AI-enabled EdTech systems need guidance from relevant government stakeholders to ensure solutions are effective and respect child rights.[138] Guidance should range from quality assessment and procurement (based on child-centred procurement standards and policies that ensure safe digital product design), through to the development of responsible use policies, and monitoring of the impacts on learning and children's rights. As a way to promote transparency, contextual relevance and trust, stakeholders procuring AI-enabled EdTech systems could involve the broader community – educators, families and students – in decision-making.

Leverage the use of AI systems in education, when it is appropriate and based on evidence.
When evidence demonstrates the pedagogical benefits of AI systems in education with identified and manageable risks, such systems should be leveraged in a privacy-preserving and rights-respecting manner. Opportunities include AI-enabled tutoring[139] and personalized learning systems for students and teachers;[140] automated formative assessments to provide additional feedback to both students and teachers; and improved teacher professional development. AI can also support education stakeholders in producing learning materials or plans, such as by automating the production of accessible textbooks[141] – as noted above – to make it more efficient and cost-effective, thereby increasing educational opportunities for all children, including students with disabilities.

RESOURCES

UNICEF Child Protection in Digital Education
A technical note and policy brief to guide governments and education providers on safeguarding children when deploying EdTech

AI for Education – Evidence Chat Library
Evidence hub with studies on AI in education. It includes access to research papers, summaries and an AI-powered assistant that helps educators and policymakers navigate digital learning evidence, from AI-For-Education.org

Generative AI Classroom Toolkit
Interactive lessons for children aged 13–15 on AI safety, bias, privacy and well-being, with teacher guides and classroom materials, from Microsoft

Further, AI can be used to offer content in more languages that is tailored for different cultural contexts. At the level of system strengthening, AI can support better education management decision-making and resource allocation through analysing trends and patterns in education data, such as identifying students at risk of dropping out to facilitate early intervention and support.

In order to realize these potential benefits, evidence is key, as investments in ineffective AI systems can take funds away from systems that work. Prior to large-scale rollouts of unvetted AI systems aiming to further educational objectives, governments should undertake a full child rights impact assessment and formal evaluation of efficacy, otherwise students' learning and privacy may be at risk.

Develop and promote AI-related awareness campaigns for parents, caregivers and society as a whole. These campaigns could focus on digital and AI literacy, digital safety, privacy and the importance of setting rules at home about the use of AI systems. The efforts should help families, caregivers and children reflect on what data children are allowed to share, why, with whom and where, and what AI systems children can use.[142] It is important to acknowledge that not all parents have the time and resources to learn about the technologies their children use and to support them appropriately. Schools and out-of-school learning institutions play a key role in providing additional support. Further, empowering parents, caregivers and children themselves to use AI systems well does not negate the need for safe, child-centred AI systems or protective government policies.

Manage the impact of AI on the future of work to uphold children's rights. The potential disruption by AI to the future of work has great relevance for what is taught and how education is provided to children today. Partnerships between industry, academia and governments to close the gap between skill needs and education provision, such as through the use of real-time data to drive foresight and forecasting of relevant job skills that inform

curriculum updates, can help prepare children for the future workplace. A proactive approach can aid in shaping future job markets towards inclusion and upholding rights, such as the right to decent work, instead of only reacting to market needs. Given the concerns around potential AI-driven job displacement or transformation in certain sectors and geographies, a forward-looking and rights-based strategy is critical to anticipating and influencing future changes.

10. Create an enabling environment for child-centred AI

AI-related strategies, policies, laws and systems exist within a broad ecosystem. Focusing on policy and practice alone is not enough.

AI-related strategies, policies, laws and systems exist within a broad ecosystem. Focusing on policy and practice alone is not enough. The enabling environment for child-centred AI includes developing digital infrastructure, supporting ongoing research on the impacts of AI systems on children, and engaging in a multi-stakeholder approach to digital cooperation.

Support infrastructure development to address the digital divide and aim for equitable sharing of the benefits of AI. In general, children who have more digital opportunities, including universal and meaningful connectivity at home[143] and at school, stand to benefit more from AI systems. This emerging 'AI divide' must be addressed to ensure the benefits of AI systems are available to all. In order to reduce digital inequalities, AI policies, laws and systems need to be supported by investment (as explored in the next point) in digital infrastructure[144] – including digital public infrastructure – and the broader digital ecosystem of child-appropriate skills, content and services. Investment and support, by governments and businesses, should address social barriers that prevent children, and especially girls, from using digital technology. It is important that governments support digital public infrastructure that is child-centred, inclusive, future-ready and based on safety-by-design from the outset.[145] More broadly, technology stakeholders should explore technical approaches and standards for designing AI solutions that work offline, at the edge of the computing stack, and/or which use minimal computational resources while still offering the best opportunities for all children.

Invest, mobilize resources and create incentives for child-centred AI policies and programmes. Developing and implementing child-centred AI policies and laws requires dedicated funding, resources and human capacity, particularly in the Global South. Targeted funding should cater to capacity-building in child online protection, including for public sector staff in education, justice and telecoms, in relation to AI. Creating an enabling environment can include actively engaging in the development of international frameworks and standards for child-centred AI (which encourages globally harmonized approaches by governments and companies), and providing incentives to all stakeholders – private sector, government agencies, civil society and academia – to partner and develop more child-centred AI policies, laws and systems.

AI strategies and policies should promote investment in evidence-based and rights-respecting AI systems that respond to bottom-up, community-driven needs, rather than rapid market-driven investment in domains with unmanaged and unregulated risks. Rights-based AI strategies can also drive sustainable digital development, as shown through the national guidance and implementation support by efforts such as the World Summit on the Information Society and the work of the ITU and UNESCO. From the business sector, a commitment to child-centred AI must be matched by investments in teams and mechanisms – including ethics, trust and safety, and moderation specialists and systems – as well as helping to grow the broader technology ecosystem for the benefit of children.

Support research on AI for and with children across the system's life cycle. Currently, AI development and usage is racing ahead without a full understanding of the effects on children, including their social, emotional and cognitive development. There is an urgent need to better understand and share opportunities, risks and case studies, and for rigorous research on the impact of AI on children and their development in the short and long term. Creative and rapid research methods should be sought that allow insights to keep pace with fast-evolving AI development. Research is also needed that better uncovers how AI regulation, design, development and deployment impacts children's well-being. Studies should include children in various developmental stages, and from a range of contexts such as those who live in rural and urban areas, are living with disabilities, or are particularly vulnerable for any other reason. This is important as research indicates children's desire to use AI decreases when its outputs do not reflect their identity or interests.[146]

Research is needed that better uncovers how AI regulation, design, development and deployment impacts children's well-being.

Where possible, undertake participatory research, not only on children, but also with them. Overall, research to protect children should be prioritized and evidence should be shared.[147] Towards this end, technology companies should responsibly and transparently share data with vetted stakeholders looking to improve platform safety and analyse insights to ensure AI supports children's rights.

Engage in digital cooperation in the public interest and for upholding children's rights. While digital technologies – including AI-based systems – cut uniquely across international boundaries, policy silos and professional domains, the current means and levels of international cooperation are sorely lacking. This is changing through efforts such as the UN's Global Digital Compact,[148] regional cooperation[149] and strategies,[150] the international network of AI Safety Institutes,[151] and the recommendations from the UN High Level Advisory Body on AI (especially those regarding children).[152] The UN General Assembly has established an Independent International Scientific Panel on AI, to serve as a bridge between the latest AI research and policymaking, and the Global Dialogue on AI Governance, which aims to act as an international platform for discussion.[153] The need for cooperation is heightened by the concentration of AI technical and human capacity in a small number of countries and companies. Consequently, the UN recommends enhanced efforts on AI cooperation, including by investment in digital public infrastructure that enables or is enabled by AI, and the creation of digital public goods:[154] open source software, open data, open AI models, open standards and open content.[155]

An inclusive, open and safety-driven approach provides conditions for research, oversight and empowered institutions and civil society, which can help support children's rights.

Standards that represent consensus approaches from experts can be a critical enabler for common approaches to child-centred AI that can scale globally. Such standards, which help bridge the gap between policy objectives and consistent, practical implementation, should be leveraged to the benefit of children everywhere. International standards bodies are key stakeholders to help avoid fragmentation, promote baseline safeguards and support policies globally while respecting local contexts. Increased child-centred AI would benefit greatly from the support of governments, the private sector, academia and civil society in cooperation and the sharing of resources and approaches. An inclusive, open and safety-driven approach provides conditions for research, oversight and empowered institutions and civil society,[156] which can help support children's rights.

RESOURCES

Understanding the impacts of generative AI use on children
Investigates how children (aged 8–12), parents, carers and teachers experience generative AI through surveys and workshops, and offers policy and industry recommendations to ensure positive, child-centred AI deployment, by the Alan Turing Institute

Foster a multi-stakeholder approach both in government and in business practices. A multi-stakeholder approach is needed in the creation of AI policies, laws and systems that cross organizational and departmental boundaries. Including children and child rights advocates as stakeholders – under the necessary conditions[157] – will allow for coordinated AI guidelines, policies, laws and systems that are realistic and ambitious.[158] Even in a multi-stakeholder approach, however, it is important to recognize the different roles of stakeholders.[159]

Support efforts towards interoperable AI, data and digital governance that provide equal opportunities and protections for children everywhere. The growing climate of AI competition risks further fragmenting cooperative governance approaches – resulting in fewer protections for children globally, and more inefficiencies from not collaborating. Interoperability and cross-border coordination are mitigating approaches, especially where global infrastructure (e.g., telecoms and cloud AI) intersects with national-level enforcement. While respecting local and cultural contexts, national and regional jurisdictions should aim to align their policies, laws, frameworks and practices,[160] including seeking common approaches and agreements on responsible data sharing, safety testing, responsible AI verification and tracking and addressing AI-related risks for children. Convergence in technologies, such as AI and neurotechnology or robotics, further underscores the need for policy interoperability within broader digital transformation governance.

Cross-cutting considerations

Below are cross-cutting recommendations to consider in AI policy and development activities:

Adapt to the national or local context. The recommendations in this guidance should be considered by all stakeholders, regardless of the AI policy or system's level of maturity, but should be adapted and implemented according to local context and the usage contexts of particular AI systems,

without compromising on children's rights. A number of approaches can support this goal.[161] To complement these broad guidelines, governments should strongly consider developing domain specific guidance, e.g., for AI in education or healthcare, that addresses each domain's particular opportunities, risks and governance landscape.

Employ foresight to better anticipate and govern AI. The fast-changing AI landscape requires forward-looking approaches to policymaking and governance for children that are agile, anticipatory and cooperative. For example, AI systems that connect and run embedded technologies, including the Internet of Things, are increasingly found in everyday environments, from homes and schools to public spaces. AI-enabled neurotechnologies are embedded in people, or worn by them to track, monitor or influence behaviour.[162] Advances in AI systems are increasing the prospect that they can identify their own deficiencies and recursively self-improve, such as when replicating the process of research.[163] Policies, laws and practices thus need to be future-readied to support and protect children beyond screen-based interactions.[164]

The fast-changing AI landscape requires forward-looking approaches to policymaking and governance for children that are agile, anticipatory and cooperative.

Governments can establish 'horizon scanning' teams or child-focused AI ethics committees to continuously monitor emerging AI trends and advise on proactive governance approaches, from policy updates to codes of conduct. Employing foresight methods,[165] including with children, to map potential AI futures and create safe spaces for experimentation, such as through regulatory sandboxes,[166] can help develop future-ready governance and ensure that AI policy and practice remains responsive to emerging risks, while grounding innovation in the best interests of children.

Be future ready. Following on from foresight, rather than reacting retrospectively to the emergence of new technologies, legal frameworks should employ language that ensures the continued relevance and applicability of those frameworks, irrespective of future technological developments. Focusing on the impacts of technologies, as opposed to the tech itself, is one way to make policies more resilient to future changes.

Implementation

As before, the guidance does not claim to have all the answers, and the challenges of moving from policy to practice are well known. AI technology and its uses are evolving rapidly, and so are the lived experiences of children around the world who interact with AI systems.

For the requirements in this guidance to address the many implementation complexities, they should be applied widely by government officials, lawmakers, policymakers, companies, UN bodies and public and civil society organizations. We thus invite all these stakeholders to openly share their approaches taken, implementation findings, lessons learned and resources.

The following steps are proposed:

1. **Use the guidance practically,** such as when creating or updating AI policies and regulations or developing, implementing or procuring AI systems.

2. **Document the experience,** including the purpose of the AI policy or system, the target audience and which of the guidance requirements and recommendations were implemented. Include what worked, what was challenging and what recommendations can be suggested for improvements.

3. **Publicly share the findings in any way,** such as through articles, project reports or conference presentations.

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UNICEF Innocenti – Global Office of Research and Foresight tackles the questions of greatest importance for children, both current and emerging. It drives change through research and foresight on a wide range of child rights issues, sparking global discourse and actively engaging young people in its work.

UNICEF Innocenti equips thought leaders and decision-makers with the evidence they need to build a better, safer world for children. The office undertakes research on unresolved and emerging issues, using primary and secondary data that represent the voices of children and families themselves. It uses foresight to set the agenda for children, including horizon scanning, trends analysis and scenario development. The office produces a diverse and dynamic library of high-level reports, analyses and policy papers, and provides a platform for debate and advocacy on a wide range of child rights issues.

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