United Nations
Educational, Scientific and
Cultural Organization

Steering AI for Knowledge Societies

A ROAM Perspective

© Andrea Rossetti. Algo-r(h)i(y)thms, 2018. Installation view at ON AIR, carte blanche exhibition to Tomás Saraceno, Palais de Tokyo, Paris, 2018. Curated by Rebecca Lamarche-Vadel. Courtesy of the artist; Esther Schipper, Berlin; Pinksummer contemporary art, Genoa.

Artificial Intelligence (AI) is increasingly becoming the veiled decision-maker of our times. The diverse technical applications loosely associated with this label drive more and more of our lives. They scan billions of web pages, digital trails and sensor-derived data within micro-seconds, using algorithms to produce significant decisions.

AI and its constitutive elements of data, algorithms, hardware, connectivity and storage exponentially increase the power of Information and Communications Technology (ICT). This is a major opportunity for Sustainable Development, although risks also need to be addressed.

Given UNESCO's mandate of promoting freedom of expression and access to information as key to building inclusive knowledge societies, it is timely to assess AI's benefits and challenges – particularly for communications and information.

A useful approach is UNESCO's Internet Universality ROAM principles. These principles urge that digital development be aligned with human Rights, Openness, Accessibility and Multi-stakeholder governance to guide the ensemble of values, norms, policies, regulations, codes and ethics that govern the development and use of AI.

This broad understanding of AI governance aligns to that used by the World Summit on the Information Society (WSIS). It resonates with the dynamic distribution of AI power across multiple and dispersed centres within governments, companies and other entities worldwide.

Using the ROAM-X prism, this document highlights implications for AI on:

- Human **Rights** such as freedom of expression, privacy and equality;
- **Openness** such as concerning knowledge, open data and open markets;
- Inclusive **Access** in regard to research, human resources, access to data, multilingualism and hardware;
- **Multistakeholder** governance in a context of "decision-making under ignorance";
- **Cross-cutting** issues: gender and Africa.

This preview is based on research by **Xianhong Hu, Bhanu Neupane, Lucia Flores Echaiz, Prateek Sibal, and Macarena Rivera Lam**. Full report available at: https://en.unesco.org/artificial-intelligence Internet Universality Indicators: https://en.unesco.org/internetuniversality

Human Rights implications

From algorithms that shape the way our social media news feed is shown, to those influencing decision-making in elections, AI already impacts many rights relevant to communication-information:

Right to freedom of expression

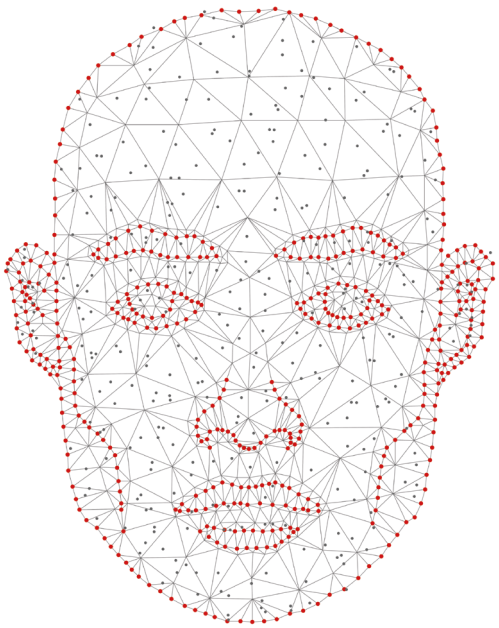
- Content personalization by AI online is enhancing how people use their right to seek information and their right to form an opinion. At the same time this weakens the pluralism of ideas to which they are exposed.
- AI is being used to remove content that incites hatred, discrimination and violence, but this has also blocked legitimate expression and the channels to redress this are inadequate.

Right to privacy

- Privacy is often infringed when AI involves opaque data collection, de-anonymization, third-party data-sharing, and the tracking and profiling of individuals. However, AI could help monitor violations and abuses of personal privacy.
- Data protection based on consent and transparency is vital in AI, but this protection is uneven around the world, and it does not deal with the full scope of privacy concerns.

Journalism and media development

- AI can strengthen journalism in its operations of gathering, verifying, analysing and distributing information; while automation can also free up journalists for higher level tasks.



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- AI is weakening the institutions of journalism and reducing their diversity by helping the migration of advertising to data-rich Internet intermediaries. Elements of AI also have a role in many digital attacks on journalists, their devices and their websites.
- AI can disseminate false content deliberately fabricated with a harmful intention and overshadow journalistic content by amplifying such disinformation. However, AI could help identify fraudulent content like "deepfakes" and their producers.

Right to equality and participation in public life

- Bias in algorithmic decision-making and/or data has been shown to discriminate on racial and other lines. Such use of ICT poses risks for the equal enjoyment of human rights by women and children, as well as minorities, indigenous groups, persons with disabilities, the LGBTQ+ population and economically disadvantaged people.
- AI elements have been abused to manipulate voters' decision-making processes, through technologies of addiction and persuasion along with the micro-targete disinformation.

Options for Action

1. **Member States** can elaborate their role in AI governance with regard to international standards for human rights, and develop mechanisms for the transparency, accountability and redressing of violations and abuses.
2. **The Private Sector and Technical Community** can conduct human rights risk and impact assessments of AI applications to ensure that these do not interfere with human rights.
3. **Academia** can engage in rights-oriented research on the social, economic and political effects of AI content personalization, including the consequences of online "echo chambers".
4. **Civil Society** can advocate that AI development and use must respect human rights.
5. **Media actors** can investigate and report on abuses and biases of AI as well as the benefits, and harness AI to strengthen journalism and media development.
6. **UNESCO and international organizations** can convene ongoing dialogues about AI to ensure that norms of human rights are kept aloft and strengthened, and not be ignored or eroded.

Openness in AI: Knowledge, Data, Markets and Opportunities

UNESCO advocates open access to scientific research, open data, open educational resources, open science and open opportunities in order to strengthen universal access to information and bridge information inequalities. Openness in AI raises challenges and opportunities.

Technological barriers to understanding

- Some machine learning algorithms have a level of complexity and dimensionality that makes their inner working unintelligible to humans. This "Black-Box" problem can pose systemic risk when algorithms engage with each other.
- Norms of disclosure and transparency are useful for clarifying intent of algorithms but are insufficient to resolve the opacity problem of AI. However, AI may also be harnessed to explain, at least in part, its own workings and its results can be audited.

Open Data

- Open Data repositories play an important role in reducing entry barriers to AI by providing high quality data for training machine learning algorithms.
- Openly available big data raises concerns with respect to privacy because of potential de-anonymization of individuals through triangulation using different open data sets.

Open Markets and Open Opportunities

- Open markets are essential for fostering innovation in AI development and for efficient allocation of resources.
- At the same time, the imperative of competition may tempt firms to take risky or protectionist decisions by ignoring ethical practices necessary for the safe and beneficial use of AI.

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Options for Action

1. **Member States** can create a more open playing field by regulating monopolies and also by ensuring open repositories for publicly-funded or publicly-owned data and source code.
2. **The Private Sector** can develop self-regulation norms for ethical practices in deployment of AI to avoid risky or anti-competitive behavior in pursuit of market advantage.
3. **Academia** can support the development of open data standards (while safeguarding privacy) and can ensure interoperability between different data sets while strengthening data commons and the availability of data for machine learning.
4. **Civil Society** can act as a watchdog against hidden operations of AI and demand greater transparency in regard to funding and use of the technologies.
5. **UNESCO** can continue to foster the Open Data movement by helping establish Open Data Standards and Open Data Repositories for AI through its network of partners and Category 2 Centres.

Inclusive Access for AI development

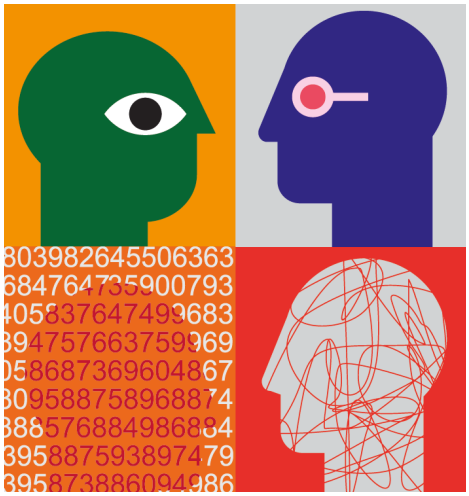
Access to data and algorithms is a determinant of AI ecosystem development. This influences the purpose of AI, the producers of AI, and who benefits or is harmed. Exacerbating existing digital chasms, there is now the growth of AI divides within and between countries. These inhibit the emergence of a diversity of applications and benefits. However, AI can strengthen access for disabled persons, as well as advance multilingualism and boost documentary preservation.

Access to Research

- The digital divide regarding the quality and the quantity of AI research is growing between and within countries.
- A challenge is whether AI can be used to help reduce the research imbalance.

Access to Knowledge, Education and Human Resources

- Shortage of personnel highlights the need for AI education and capacity-building, especially amongst under-represented groups and countries.
- Some research centres draw in global talent, with the effect of brain-drain elsewhere. However, there are some efforts to upgrade skills of local employees, to crowd-source solutions; and to offer AI service platforms without costly investment in infrastructure and human resources.
- AI's accessibility to all depends on the competencies of the broad public to understand their engagement with it. Yet Media and Information Literacy is far from universal, and even further from empowering people with knowledge about AI issues.



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Access to Data

- Technology firms own large amounts of user data and use it to train algorithms, but this unequal access to data creates entry barriers for new entrants, including start-up firms.
- Data commons with access to open data repositories can enable the training of algorithms that may ameliorate monopolization trends in AI development.

Access to Connectivity and Hardware

- AI access depends on access to affordable broadband, cloud storage and specialized computational hardware that can run algorithms on processors designed to perform large numbers of calculations.
- Emerging cloud-based possibilities can avoid large overheads or fixed-cost investments for smaller AI developers and users.

Options for Action

1. **Member States** can strengthen research infrastructure for AI; support open access dissemination of research; boost coding skills through online courses; strengthen policies for Media and Information Literacy; and support access to AI specific computational hardware through subsidies.
2. **Member States** can promote affordable access to bandwidth, hardware and software, as well as AI use in multilingualism, so as to enhance public potential to develop and benefit from AI.
3. **The Private Sector** can provide greater access to affordable connectivity, hardware and software needed for running AI programs.
4. **Academia** can improve access to AI algorithms for learning through the creation of research repositories and by offering online education for AI.
5. **Civil Society** can support the development of AI content and resources in formats and languages that render the information about AI more widely available.
6. **UNESCO** can support Member States to enhance AI research capacity in general, and in the areas of communication-information in particular, through stimulating relevant trainings, education policy development, academic exchanges and the Information for All Program.

Multistakeholder Approach for AI governance

All stakeholders – from governments, companies, technical community, IGOs, civil societies to academia and researchers – are increasingly impacted by AI. They therefore have a strong interest in the evolution of norms, policies, codes, etc. that play a part in governing this technology. Due to the complexity and uncertainty in AI issues, much decision-making is in unchartered territory. When many decisions may have to be "made under ignorance", an open and inclusive multi-stakeholder approach can help pool wisdoms and promote shared norms and ethics.

Effective multistakeholder processes are:

- Inclusive
- Diverse
- Collaborative
- Transparent
- Equal
- Flexible and Relevant
- Safe and Private
- Accountable and Legitimate
- Responsive

Possibilities for AI multistakeholder discussions

- Legal and regulatory framework for participation in legislation and policy.
- National AI & Internet governance fora.
- International and regional AI & Internet governance fora.
- Company consultations on terms of service and operating procedures.

Options for Action

1. **Member States** can adopt a multi-stakeholder framework for their involvement in AI.
2. **The Private Sector and Technical Community** can be more actively involved in national and international level policymaking concerned with the AI and engage other actors in their internal governance issues such as defining terms of service and operating procedures.
3. **Civil society and Academia** can conduct research to support the institutionalization and sustainability of multi-stakeholder governance experiences.
4. **Journalists and Media Actors** can participate actively in, and provide coverage of, AI-related governance processes.

Crosscutting issues

AI and gender

AI applications are developed and deployed in a context that reflects gender inequalities. Does that mean AI inherently embodies sexism, or can it be gender-transformative? Relevant issues are:

- Male predominance in AI development;
- Algorithmic and data discrimination against women;
- Female interactive-voice assistants and the sex robot industry;
- AI and LGBTQ+ concerns;
- AI-related job loss versus skills development for women;
- Cyberfeminism.

AI and Africa

Africa is a UNESCO Global Priority and an important focus for its activities related to artificial intelligence. Challenges and potentials of human resources in AI development on the continent need addressing. Speakers of smaller African languages could be left behind in regard to the development of AI-fueled speech-to-text and translation capabilities. African-generated data can risk being mined without benefit to local stakeholders as well as being traded internationally with insufficient regard for privacy standards. A lack of AI policy frameworks in many government calls out for attention, not least in regard to communication-information issues.

Overarching Options

All stakeholders can consider addressing AI in relation to communication-information through:

- Using **UNESCO's Internet Universality indicators** to measure human Rights, Openness, Accessibility and Multi-stakeholder participation and to thereby map and improve the ecosystem in which AI is developed, applied and governed.
- Applying **human rights norms** that can inform more specific guidelines for rights to expression, privacy, and participation in public life.
- Raising awareness of **ownership and access to big data, AI skills and technologies**, and the issues of who benefits, as well as harms such as marginalization or manipulation of human agency.
- Assessing **algorithmic discrimination** in order to protect the right to equality of all, in particular of historically marginalized populations.
- Participating in **interdisciplinary research** on how AI intersects with human rights, openness, accessibility and multistakeholder governance, and promoting Open Access publishing of the research results.
- Upholding **open market competition** to prevent monopolization of AI, and requiring adequate safeguards against violation of ethical practices by market actors.
- Facilitating **development of norms and policies for improving openness and transparency** in AI algorithms through elements of ex-ante information disclosure and ex-poste monitoring of algorithmic decision-making.
- Working to **reduce digital divides**, including gender divides, in regard to AI access, and establishing independent monitoring mechanisms.
- Motivating for more **active participation in AI governance from all stakeholder groups**, including but not limited to Governments, the Private Sector, Technical Community, Civil Society, Academia, International organizations and Media.
- Ensuring **gender equality, linguistic and regional diversity** as well as the **inclusion of youth and marginalized groups** in multi-stakeholder dialogues on AI issues.
- Integrating **discussion of AI issues into relevant events** such as international days around press freedom, disability, and universal access to information, and drawing in networks such as UNITWIN, Orbicom, Gapmil, and Gamag, as well Category 2 institutes, NGOs, IFAP national committees and UNESCO National Commissions.

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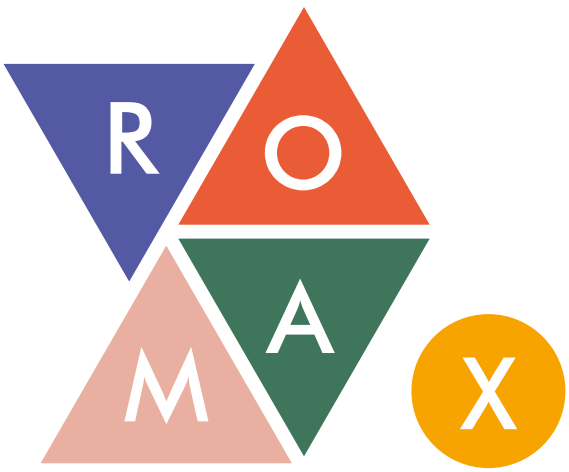
UNESCO's 39/C5 Programme, agreed by its Member States, states that the Communication-Information Sector will "address emerging challenges – which are inherent to technological development such as the Internet of Things, algorithmic decision making and artificial intelligence – including the risks associated with increased surveillance, profiling and data privacy, with the uncertain impact of big data and continued digitalization on communication, journalism, employment, equality and empowerment." (Paragraph 06007)

The insights in this document can help to better harness AI to achieve Sustainable Development Goal 16.10 on "public access to information and fundamental freedoms", with multiplier benefit for other parts of the 2030 Development Agenda.



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