

GLOBAL INFORMATION SOCIETY WATCH 2019

Artificial intelligence: Human rights, social justice and development



ASSOCIATION FOR PROGRESSIVE COMMUNICATIONS (APC),
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Artificial intelligence: Human rights, social justice and development

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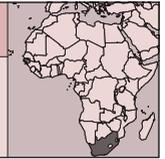
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SOUTH AFRICA

AI TECHNOLOGIES FOR RESPONSIVE LOCAL GOVERNMENT IN SOUTH AFRICA



Human Sciences Research Council

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Introduction

In 2018, South Africa's Department of Cooperative Governance and Traditional Affairs (CoGTA) partnered with a private company to launch GovChat, an online citizen engagement application designed to promote responsive and accountable local government through the development of an accessible platform for direct messaging between citizens and their local government councillors. The planned pipeline for GovChat includes the integration of artificial intelligence (AI) technologies to boost effectiveness and efficiency.¹ GovChat is one of several applications exploring the use of AI to enhance citizen engagement with local government in South Africa. This country report discusses whether emerging AI-enabled e-government projects, such as GovChat, and associated policies and information legislation are likely to enable a more responsive local government and inclusive development. More specifically, we explore whether these initiatives point to the development of inclusive, "society-in-the-loop"² systems that support the realisation of human rights, including privacy, non-discrimination and access to information.

New directions on poverty, unemployment and inequality

With its recent history of apartheid, South Africa remains saddled with persistently high poverty and unemployment rates as well as stark inequalities, largely along racial lines. Responding to these intersecting crises, the South African government continues to pursue a number of economic and social reforms. A key priority is to build a capable state and responsive public service which is able to

engage with the specific circumstances and capabilities of communities.³

More recently, the government has developed a number of new policies broadly aimed at enhancing the role played by science and technology in supporting more inclusive economic growth, while also re-emphasising the significance of emerging information and communications technologies (ICTs) in an efficient and responsive public service. Among these policy developments are the Draft White Paper on Science, Technology and Innovation,⁴ the National Integrated ICT Policy White Paper,⁵ and South Africa's National e-Strategy Towards a Thriving and Inclusive Digital Future 2017-2030,⁶ all of which fall broadly under South Africa's burgeoning policy discourse on the Fourth Industrial Revolution (4IR).

The recurring emphasis on ICTs comes from a recognition of the impact that the 4IR will have on government, which will "increasingly face pressure to change their current approach to public engagement and policymaking."⁷ To this end, national and subnational government entities have promoted a range of e-governance platforms and policies over the past two decades. The 2018 partnership that saw the launch of GovChat reflects a heightened interest in the role of web, data and social media platforms for improving government service delivery, in this case by CoGTA, the national ministry responsible for ensuring municipalities perform their core service delivery functions.⁸ The increasing prominence of AI in these e-governance plans

1 <https://www.uwc.ac.za/UWCInsight/sholarship@uwc/ColloquiumPresentationsDay1/Govchat%2027%20Oct%202017.pptx>
2 Balaram, B., Greenham, T., & Leonard, J. (2018, 29 May). Artificial Intelligence: real public engagement. *RSA Reports*. <https://medium.com/rsa-reports/artificial-intelligence-real-public-engagement-6bofdo73e2c2>

3 Republic of South Africa. (2018, 20 September). Minister Ayanda Dlodlo: Introducing constitutional values and principles to build a values-driven public service. <https://www.gov.za/speeches/inculcating-constitutional-values-and-principles-including-batho-pele-principles-build>
4 Department of Science and Technology. (2018). *Draft White Paper on Science, Technology and Innovation*. https://www.dst.gov.za/images/2018/Draft-White-paper-on-STI-7_09.pdf
5 Department of Telecommunications and Postal Services. (2016). *National Integrated ICT White Paper*. https://www.dtps.gov.za/images/phocagallery/Popular_Topic_Pictures/National_Integrated ICT_Policy_White.pdf
6 Department of Telecommunications and Postal Services. (2017). *Digital Society South Africa: South Africa's National e-Strategy towards a thriving and inclusive digital future 2017-2030*. https://www.dtps.gov.za/images/phocagallery/Popular_Topic_Pictures/National-e-strategy.pdf
7 https://www.gov.za/sites/default/files/gcis_document/201812/42078gen764.pdf
8 www.cogta.gov.za/?page_id=253

has significant implications for local government and its relationship with citizens.

AI in South Africa's local government

A 2018 Access Partnership report on “Artificial Intelligence for Africa” compiled by the University of Pretoria identifies examples of where AI can improve citizen interaction, including the use of chatbots, scanning legal documents and classifying citizen petitions. Deeper in the planning and operational activities of public entities, the enhanced predictive capabilities of AI can be used for pre-emptive interventions around the provision of social services and infrastructure maintenance.⁹

GovChat is similarly exploring the use of AI to enhance government efficiency and responsiveness, along the full information processing chain. At its core, GovChat is an online application that allows users to submit queries about public services to councillors and public officials through a variety of electronic channels including websites, WhatsApp and USSD.¹⁰ The South Africa Open Government Partnership (OGP) End-of-Term Report highlights three components of GovChat relevant to citizen engagement:

- A survey tool to rate civil service facilities such as police stations and schools¹¹
- A facility to view service requests
- A donation tool, allowing users to donate blankets, food, clothes and electronics for collection by the local ward councillor.¹²

The expectation from CoGTA is that through GovChat, government will be “instantly accessible to over 16 million people” and “citizens will be able to access over 10,000 public representatives supporting over 30,000 public facilities and services in communities across the country.”¹³ Importantly, the planned pipeline for GovChat includes the integration of “Artificial Intelligence responses”, “Predictive Trend mapping” (in its Version 2 roll-out

in 2019) and “Natural Language query input” (Version 3, 2020).¹⁴

These AI applications dovetail with many of the challenges experienced by local government officials in South Africa. A key concern is improving citizen-government interaction given the large volume of service queries received from citizens on multiple channels. For example, the City of Tshwane 2018 Customer Engagements and Complaints Management Policy expects that AI will be able to proactively “affirm” and consolidate repeat queries.¹⁵ Broadly, under South Africa’s constitutional commitments, GovChat and its AI capabilities offer an opportunity to enhance responsive and accountable government,¹⁶ while at the same time fulfilling the state’s obligations in terms of the rights of freedom of expression,¹⁷ access to information¹⁸ and just administrative action.¹⁹ Moreover, GovChat is expected to promote access to local government for those segments of the population who may have historically struggled due to physical or social barriers, including women and those with disabilities.²⁰ In this way, GovChat can theoretically contribute to the vision of the Constitution to create a “democratic and open society in which government is based on the will of the people” and all are equal.²¹

While CoGTA’s expectations of GovChat seem ambitious, the similar MomConnect initiative has

9 University of Pretoria. (2018). *Artificial Intelligence for Africa: An Opportunity for Growth, Development, and Democratisation*. Access Partnership. https://www.up.ac.za/media/shared/7/ZP_Files/ai-for-africa.zp165664.pdf

10 USSD (unstructured supplementary service data) refers to a mobile communication technology for sending text between a mobile phone device and another application program in the network.

11 Users are able to search for particular facilities and to rate both the service and facilities. Survey results are submitted to contact persons at the relevant facility.

12 Humby, T. (2019). *Open Government Partnership Independent Reporting Mechanism (IRM): South Africa End of Term Report 2016-2018*. https://www.opengovpartnership.org/sites/default/files/South-Africa_EOTR_2016-2018.pdf

13 Republic of South Africa. (2018). Deputy Minister Andries Nel. Launch of Govchat. <https://www.gov.za/speeches/govchat-25-sep-2018-0000>

14 <https://www.uwc.ac.za/UWCInsight/scholarship@uwc/ColloquiumPresentationsDays1/Govchat%2027%20Oct%202017.pptx>

15 City of Tshwane. (2018). Customer Engagements and Complaints Management Policy. www.tshwane.gov.za/PublicParticipation/12.%20Customer%20Engagements%20and%20Complaints%20Management%20Draft%20Policy%20for%20CoT.pdf

16 Under the Constitution of the Republic of the South Africa, Act 108 of 1996, the objectives of local government are set out as follows:

152. (1) The objects of local government are—
- (a) to provide democratic and accountable government for local communities;
 - (b) to ensure the provision of services to communities in a sustainable manner;
 - (c) to promote social and economic development;
 - (d) to promote a safe and healthy environment; and
 - (e) to encourage the involvement of communities and community organisations in the matters of local government.
- (2) A municipality must strive, within its financial and administrative capacity, to achieve the objects set out in subsection (1).

17 Section 16 of the Constitution.

18 Section 32 of the Constitution.

19 Section 33 of the Constitution.

20 DareDisrupt. (2019). *Civic Tech: Smart Use of Civic Tech to Promote Accountability and Transparency*. Danish Church Aid. https://www.danchurchaid.org/content/download/23246/414917/version/1/file/Civic%20tech%20mapping%20final_FEB19_PDFa.pdf

21 Preamble to the Constitution.

registered over two million subscribers.²² MomConnect is a USSD, text and WhatsApp-based maternal health information platform implemented by South Africa's National Department of Health together with various partners. The scale of the programme suggests that AI-supported citizen engagement applications could already reach large audiences across the country. In addition, there has been increasing experimentation with AI methods (mainly machine learning) in the back-end of South Africa's local government operations, such as for planning transport routes,²³ clinic placement²⁴ and electricity management.²⁵ This work builds on a wider base of (typically less adaptive) predictive modelling and automated decision making (ADM) technology already used in South African municipalities.

Ensuring inclusive local governance outcomes

The current and emerging scale of AI and ADM adoption requires urgent reflection on the potential benefits and limitations for local governance, discussed below.

Accessibility

If the benefits of citizen-engagement platforms and AI are to reach all communities equally, we will need to address challenges around the accessibility of GovChat-like applications and associated AI, starting with underlying connectivity. While social media use has increased steeply since 2012, internet penetration in South Africa remains low, particularly in comparison with other African countries.²⁶ Moreover,

internet penetration is especially poor in rural areas of South Africa which would benefit most from remote interaction with local councillors and electronic government applications. Although USSD is a more accessible option for interacting with these services, smart devices enable much richer communication, but with a higher initial device cost as well as the ongoing cost of data. South Africa ranks among the most expensive countries for data services in Africa, especially for prepaid mobile data plans.²⁷ Further, citizen-engagement applications require a particular level of technological know-how and confidence to use and trust the technology, which may be exacerbated by unfamiliar user interfaces and languages, such as current virtual private assistants (VPAs) which are predominantly English-speaking and female.²⁸ Ongoing research around local government's use of AI-supported automated translation and text-to-speech tools is therefore important.²⁹

Privacy and trust

When it comes to government's collection and processing of data through AI-enabled applications, a fundamental concern regarding individual privacy and potential state surveillance is raised. The increased use of social media in South Africa means that governments can mine and analyse comments on public channels, then "agilely respond to citizens' complaints"³⁰ or even influence emerging issues. This raises serious privacy concerns. In South Africa, perhaps the most controversial use of AI technologies by the state has been in predictive policing, such as through "upgrades" to CCTV camera systems in the City of Johannesburg to enable facial recognition³¹ and broader research

22 <https://www.praekelt.org/momconnect>

23 Van Heerden, Q. (2015). *Using Social Media Information in Transport and Urban Planning in South Africa*. Smart and Sustainable Built Environment (SASBE). <https://hdl.handle.net/10204/9871>; and ITU. (2019). WSIS Prizes Contest 2019 Nominee: GoMetro. <https://www.itu.int/net4/wsis/stocktaking/Prizes/2020/DetailsPopup/15434965423625087>

24 Conway, A. (2016). *Optimizing Mobile Clinic Locations using Spatial Data*. Presentation at MIA Meetup at Rise Africa, Cape Town, 27 October. <https://drive.google.com/file/d/0BxzNs-HspAzYSDJoMWpVcdFYnc/view>

25 <https://dsideweb.github.io/articles/project-matla>

26 Internet penetration in South Africa is currently at 53.7%. Kenya, by way of example, has an internet penetration rate of 83% (see <https://www.internetworldstats.com/stats1.htm>). The government has rolled out free public Wi-Fi access in selected communities and areas, yet the reach of these services is still not sufficient to address the needs of the many millions, particularly those in rural communities. Smartphone applications have, however, found success in selected industries and communities such as small-scale fishers being networked on a smartphone application called ABALOBI that aims to link small-scale fishers to governance processes, thereby increasing profits and limiting time from hook to table. This app helps in retaining good governance structures, compliance, sustainability education and ensures local development through the adoption of fair trade practices. See: <https://abalobi.info>

27 Provisional findings by the Competition Commission highlight South Africa's "anti-poor retail price structures". www.compcom.co.za/wp-content/uploads/2017/09/Data-Services-Inquiry-Report.pdf

28 Ní Loideáin, N., & Adams, R. (2018, 10 October). Gendered AI and the role of data protection law. *talking humanities*. <https://talkinghumanities.blogs.sas.ac.uk/2018/10/10/gendered-ai-and-the-role-of-data-protection-law>

29 <https://www.sadilar.org>; see also Calteaux, K., De Wet, F., Moors, C., Van Niekerk, D., McAllister, B., Grover, A. S., Reid, T., Davel, M., Barnard, E., & Van Heerden, C. (2013). *Lwazi II Final Report: Increasing the impact of speech technologies in South Africa*. Pretoria: Council for Scientific and Industrial Research. <https://hdl.handle.net/10204/7138>

30 Moodley, K. (2016, 5 August). Power of sentiment analysis for public service. *ITWeb*. <https://www.itweb.co.za/content/VKA3Wwq697rydZ>

31 Swart, H. (2018, 28 September). Joburg's new hi-tech surveillance cameras: A threat to minorities that could see the law targeting thousands of innocents. *Daily Maverick*. <https://www.dailymaverick.co.za/article/2018-09-28-joburgs-new-hi-tech-surveillance-cameras-a-threat-to-minorities-that-could-see-the-law-targeting-thousands-of-innocents>

collaborations with the South African defence and police forces to “Build Safer Communities”.³² Meanwhile, the unauthorised use of data to exploit social grant recipients has undermined already limited trust in IT systems.³³

Concerns about how personal data is going to be used by the state point to a broader challenge of declining trust in government and in South Africa’s local government in particular.³⁴ Mistrust of (and within) local government, including suspicion of and actual corruption, as well as resistance to new technologies which can potentially expose mismanagement or wrong-doing, significantly impedes the possibilities of what emerging technologies could achieve.³⁵ The relatively opaque character of AI risks obscuring transactions and decisions even further.

Practitioners will need to work with elected officials and civil society organisations in using AI to strengthen existing local accountability mechanisms, while building a stronger culture of data protection and safeguards against unnecessary state (and service provider) processing of personal information.

Explainability and accountability

Ensuring that citizens have sufficient understanding about how AI is processing their data is critical for building trust and enabling accountability. However, in local government there are often limited technical skills, which makes it difficult for officials to understand and explain existing data processing in platforms like GovChat, which is likely to be compounded by the introduction of AI features. There is therefore a need to define a reasonable level of understanding and explanation that addresses AI but also the wider spectrum of ADM approaches in use by government.³⁶

The technical complexity and adaptive nature of AI means that it may not be feasible or useful to provide “sufficient information about the underlying logic of the automated processing” as suggested in South Africa’s key data protection law, the Protection of Personal Information Act (POPIA);³⁷ or an extensive “right to explanation”, as debated in the crafting of the European Union’s General Data Protection Regulation (GDPR).³⁸

As a start we may look to define broad principles for “algorithmic accountability” and an acceptable scope of influence for AI and ADM that national and local governments can draw on. For example, the African Union (AU) Convention on Cyber Security and Personal Data Protection defines the limit as:

A person shall not be subject to a decision which produces legal effects concerning him/her or significantly affects him/her to a substantial degree, and which is based solely on automated processing of data intended to evaluate certain personal aspects relating to him/her.³⁹

Additional lower level principles may include ensuring that data processing is accurate, does not discriminate, can be audited, and that there are mechanisms for redress and mitigation of negative social impacts.⁴⁰ Moreover, a carefully designed “algorithmic impact assessment” can facilitate broad dialogue about the implications of different AI technologies.⁴¹

Inevitably there will be overlapping layers of global, national and subnational regulation of AI issues. While the AU is seeking to harmonise cybersecurity policy across member states, countries and subnational governments are likely to pursue their own interpretations and legal frameworks governing transparency, accountability and other safeguards in the use of AI. In South Africa, the regulatory body established under POPIA is not

32 Council for Scientific and Industrial Research. (2016). *CSIR Annual Report 2015/16: Our Future Through Science*. https://www.csir.co.za/sites/default/files/Documents/CSIR%20Annual%20Report%202015_16.pdf; Kwet, M. (2017, 27 January). *Cmore: South Africa’s New Smart Policing Surveillance Engine*. *CounterPunch*. <https://www.counterpunch.org/2017/01/27/cmore-south-african-new-smart-policing-surveillance-engine>; and Ní Loideáin, N. (2017). *Cape Town as a Smart and Safe City: Implications for Governance and Data Privacy*. *International Data Privacy Law*, 7(4), 314-334.

33 The Citizen. (2018, 8 March). *Black Sash back in court over social grants*. *The Citizen*. <https://citizen.co.za/news/1845959/black-sash-back-in-court-over-social-grants>

34 www.hsrc.ac.za/uploads/pageContent/9835/2019-03-28%20DGDG%20Youth%20%20Elections%20Seminar.pdf

35 We are particularly grateful to Caroline Khene, co-director of MobisAM, for her insights in this section of the report. <https://mobisam.net>

36 Algorithm Watch. (2019). *Atlas of Automation: Automated decision-making and participation in Germany*. https://atlas.algorithmwatch.org/wp-content/uploads/2019/04/Atlas_of_Automation_by_AlgorithmWatch.pdf

37 https://www.gov.za/sites/default/files/gcis_document/201409/3706726-11act4of2013protectionofpersonalinfoorcorrect.pdf

38 Doshi-Velez, F., Kortz, M., Budish, R., Bavitz, C., Gershman, S., O’Brien, D., Schieber, S., Waldo, J., Weinberger, D., & Wood, A. (2017). *Accountability of AI Under the Law: The Role of Explanation*. Cornell University. <https://arxiv.org/abs/1711.01134>

39 African Union. (2014). *African Union Convention on Cyber Security and Personal Data Protection*. Article 14(5). <https://au.int/en/treaties/african-union-convention-cyber-security-and-personal-data-protection>

40 World Wide Web Foundation. (2017). *Algorithmic Accountability: Applying the concept to different country contexts*. https://webfoundation.org/docs/2017/07/WF_Algorithms.pdf

41 Supergovernance. (2018, 18 March). *A Canadian Algorithmic Impact Assessment*. *Medium*. <https://medium.com/@supergovernance/a-canadian-algorithmic-impact-assessment-128a2b2e7f85>

yet fully functional. However, it is expected to play a crucial role in enforcing compliance with the Act and promoting good data and AI governance in South Africa.

Small data

Globally, AI projects have been affected by the limited availability of training data from many regions and population groups, which has resulted in bias and discrimination in the operation of AI tools.⁴² In local contexts, the relatively small amount of available data can lead to “overfitting” of algorithms and inaccurate predictions.

A further issue is the risk of re-identification of personal data, which is higher in geographic regions with small populations.⁴³ AI-related methods are used to re-identify and link data records across databases, which can be helpful for integrating local government planning or service provision across multiple departments. But it can also result in unauthorised disclosure of private information, which would constitute a violation of POPIA. In these circumstances, data managers may try to ascertain which variables (e.g. town, education, race or gender) increase the likelihood of disclosure and develop masking strategies to reduce the risk, such as in the Google Cloud Data Loss Prevention service.⁴⁴

Beyond these technical issues is a more fundamental question about who data is being collected for and where it is being used. The demand for data in AI (and in national and global data initiatives) creates pressure on local data collection systems to improve the scale and quality of data sourcing, feeding into an extractive local-global pipeline. A “small data” perspective⁴⁵ prioritises more local forms of data collection *and* use, which leads to new questions and possible models for how data is shared and processed within and between individuals and communities. For example, data cooperatives⁴⁶ and

data commons⁴⁷ shift the locus of control to the contributors of the data, while the citizen science community works on vocabularies and ontologies for data sharing between projects.⁴⁸ These activities could provide the conceptual and technical foundations for local government AI projects that are anchored in small data sharing and re-empowered citizens. The AI “black-box” is likely to add to the sense that individuals are losing control over their data⁴⁹ and undermine meaningful, place-based governance processes.

Conclusion

While the planned adoption of AI in GovChat and similar platforms represents an important step forward in the use of AI-related technologies to support the work of government, it also provides a critical opportunity to critique and reflect on the associated social, legal and technological concerns raised by such developments. This report has outlined some of the key concerns in this regard, particularly with regard to accessibility, privacy, trust, explainability, accountability, and the challenges and opportunities associated with small populations and data sets.

A general point is the need to empower both citizens and local government officials to use and benefit from such technologies. Through more inclusive impact assessments, design methods and accountability mechanisms, legislators and system developers can support the development of user-centred AI innovations with higher levels of trust, adoption and impact.

Moreover, in South Africa, as elsewhere, local government is regarded as the “face of government”.⁵⁰ However, the importance of (physical or virtual) proximity and face-to-face interaction in local governance is often underestimated in ICT implementation. This consideration applies to AI-enabled systems which should seek to *enhance* (rather than *replace*) existing, often trusted ways of doing things. In doing so, South Africa can work toward developing its own set of ethical tenets and principles upon which the use of AI in government and elsewhere can be based.

42 Hao, K. (2019, 4 February). This is how AI bias really happens—and why it’s so hard to fix. *MIT Technology Review*. <https://www.technologyreview.com/s/612876/this-is-how-ai-bias-really-happens-and-why-its-so-hard-to-fix>

43 Greenberg, B., & Voshell, L. (1990). Relating risk of disclosure for microdata and geographic area size. *American Statistical Association 1990 Proceedings of the Section on Survey Research Methods*, 450-455. www.asasrms.org/Proceedings/papers/1990_074.pdf

44 <https://cloud.google.com/dlp/docs/concepts-risk-analysis>.

45 See: Data and Sustainable Development: Last Mile Data Enablement and Building Trust in Indicators Data. <https://cs.unu.edu/research/sdgs>

46 Walsh, D. (2019, 8 July). How credit unions could help people make the most of personal data. *MIT Sloan School of Management*. <https://mitsloan.mit.edu/ideas-made-to-matter/how-credit-unions-could-help-people-make-most-personal-data>

47 Baarbé J., Blom, M., & de Beer, J. (2017). *A data commons for food security*. Open AIR. <https://www.openair.org.za/publications/a-data-commons-for-food-security>

48 The Citizen Science COST Action: Working Group 5 – Improve data standardization and interoperability. <https://www.cs-eu.net/wgs/wg5>

49 Thinyane, M. (2018). Towards Informing Human-centric ICT Standardization for Data-driven Societies. *Journal of ICT Standardization*, 6(3), 179-202. <https://dx.doi.org/10.13052/jicts2245-800X.631>

50 https://ossafrica.com/esst/index.php?title=Summary_of_the_Municipal_Systems_Act%2C_no._32_of_2000

Action steps

The following steps are recommended for South Africa:

- Enhance scientific literacy and life-long learning in order to strengthen public understanding of science and technology, including AI, and its potential impact on society.
- Contribute to global, AU and national initiatives on principles for “algorithmic accountability” that local governments can adapt and use.
- Explore what role (sub)national legislatures and independent regulators should play in AI oversight, and build necessary capacity in these entities for supporting government entities with ethical AI implementation in South Africa.
- Run a programme of public engagement and consider a diversity of legal approaches (privacy, competition, criminal) to embed a culture of data protection and formal safeguards against unnecessary state and private sector processing of personal information.
- Design algorithmic impact assessments that can facilitate broad dialogue about the implications of different AI technologies in local government.
- Improve risk assessment and mitigation capabilities among system developers to prevent re-identification and discrimination when building platforms and integrating with local data systems.
- Explore alternative business models and technologies for data collection and sharing to strengthen the role of data contributors in AI systems.
- Support ongoing research into languages/translation and user interfaces for AI implementation in different contexts.

Artificial intelligence: Human rights, social justice and development

Artificial intelligence (AI) is now receiving unprecedented global attention as it finds widespread practical application in multiple spheres of activity. But what are the human rights, social justice and development implications of AI when used in areas such as health, education and social services, or in building “smart cities”? How does algorithmic decision making impact on marginalised people and the poor?

This edition of Global Information Society Watch (GISWatch) provides a perspective from the global South on the application of AI to our everyday lives. It includes 40 country reports from countries as diverse as Benin, Argentina, India, Russia and Ukraine, as well as three regional reports. These are framed by eight thematic reports dealing with topics such as data governance, food sovereignty, AI in the workplace, and so-called “killer robots”.

While pointing to the positive use of AI to enable rights in ways that were not easily possible before, this edition of GISWatch highlights the real threats that we need to pay attention to if we are going to build an AI-embedded future that enables human dignity.

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