PARADIGM INITIATIVE

Policy Brief

Artificial Intelligence in Kenya

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EXECUTIVE SUMMARY

Artificial Intelligence carries significant benefits that can be leveraged to solve Kenya's most prevalent problems that cut across various sectors including health, education, agriculture, finance and business. Its adoption can grow the country's economy and enable it to partake in the Fourth Industrial Revolution (4IR).

Across the health sector, AI has been resourceful in the detection of diseases, in agriculture it has provided means for early detection of crop diseases, in fintech it has enabled the unbanked population to access fast short-term loans, and in education it has provided students with personalized learning resources. These benefits have brought excitement around AI.

However, despite the active uptake of AI systems, their use has been seen to undermine human rights and segregate marginalized groups in the society. This Policy Brief seeks to examine the impact of AI systems on human rights in Kenya with a view of providing recommendations to the Government on how these systems can be utilized without undermining human rights.

It begins by giving a picture of the application of AI in Kenya. It then highlights the challenges faced in the adoption of AI systems in the country which include; lack of relevant data for the development of the systems, lack of regulatory framework governing the AI ecosystem in the country, lack of relevant AI skills due to low uptake of STEM courses, connectivity divide in the country, and the lack of investment in research on development of AI systems and protection of human rights. The Policy Brief outlines the need for the Government to address these challenges for purposes of utilization of AI systems and protection of human rights.

It then analyses the risks posed by the use of AI systems on human rights. These risks include: bias caused by the systems due to training algorithms with inaccurate and unrepresentative data that produce unfavorable results to certain groups of people; weaponization of AI systems by the Government which as a result undermine freedom of expression and association; gender inequality caused by AI bias, few women in the AI industry, and lack of access by women to the internet and mobile devices ; surveillance through the use of facial recognition technologies; data protection; and violation of rights through contents moderation.

The Policy Brief concludes by providing recommendations on what measures the Government should take to prevent violation of rights.

INTRODUCTION

Artificial Intelligence (AI) is defined as the ability of machines to replicate human capabilities through "learning and automation".[1] It is also defined as an area in computer science that develops machines with the ability to perform human-like tasks through automated decision making, learning, and recognition.[2] It enables machines to act, comprehend, and sense like humans,[3] and is made possible by training them with large datasets.[4] Consequently AI gives machines the ability to perceive their environment, reason, and in some instances take action in response to the environment and underlying circumstances.[5]

AI brings with it significant promises that have the potential of transforming Africa. At the heart of it, AI can solve Africa's most pervasive problems such as poverty, education, diseases, healthcare, and food supply.[6] It can be critical in the achievement of the sustainable development goals in Africa which include; "reduction of poverty and hunger, improvement of the quality of education, provision of clean water and sanitation, affordable and clean energy, peace, justice, and strong institutions" among others.[7]

In Africa, it has found a wide application where it is applied in key sectors such as banking, e-commerce, health, agriculture, energy, education, and industrial manufacturing.[8] The AI Readiness Index 2020 however ranks Sub-Saharan Africa as the least scoring region across the globe.[9] The Index, which assesses a government's AI readiness based on three key pillars - government, technology sector, and data and infrastructure, only has a few African countries in the top 100 nations in the world. These include Mauritius ranked 45th, South Africa 59th, Seychelles 68th, Kenya 71st, and Rwanda 87th in the world.[10] The Index primarily measures the steps taken by Governments to implement AI.

In Kenya, AI is applied across several sectors such as agriculture, health, education, fintech, transport, among others. The country has been positioning itself to partake of the benefits brought by the Fourth Industrial Revolution (4IR) technologies such as AI. In 2018 the Government commissioned the Blockchain and Artificial Intelligence Taskforce to provide directions on how best AI to utilise AI.[11] Key among the recommendations made by the Taskforce include; development of policies promoting AI and protecting human rights, development of an AI ecosystem that supports the development of AI, and analysis of potential risks of AI and putting in place mitigation measures.[12]

With the excitement brought about by AI and the Fourth Industrial Revolution, it is important not to overlook its impact on human rights. AI also has its downside and its use has been seen to cause bias,

1 Akanksha Sharma, Sam Ajadi, Andreas Beavor, Artificial Intelligence and Start-Ups in Low-and Middle-Income Countries: Progress, Promises, and Perils (GSM Association 2020) 6
https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/10/Artificial-Intelligence-and-Start-Ups-in-Low-and-Middle-Income-Countries-Progress-Promises-Perils-Final.pdf
2 Maya Medeiros, 'Artificial Intelligence and the Future of Agriculture'(Norton Rose FullBright 2018) 10
https://www.nortonrosefulbright.com/en-us/knowledge/publications/6400e1ea/artificial-intelligence-and-the-future
3 Artificial Intelligence for Africa: An Opportunity for Growth, Development, and Democratisation (Access Partnership 2018) 4
https://pic.strathmore.edu/wp-content/uploads/2019/03/PIC_AI_for_Africa_Whitepaper.pdf
4 Ibid
5 Ibid
6 Ibid
7 Arthur Gwagwa, Patti Katchidza, Kathleen Siminyu, Matthew Smith, Responsible Artificial Intelligence in Sub Saharan Africa: Landscape and General State of Play (AI4D) 5
https://ircai.org/wp-content/uploads/2021/03/AI4D_Report_Responsible_AI_in_SSA.pdf
8 Eleanor Shearer, Richard Stirling, Walter Pasquarelli, Government AI Readiness Index 2020(Oxford Insights, 2020) 83
https://static1.squarespace.com/static/58b2e92c1e5b6c828058484e/t/5f7747f29ca3c20ecb598f7c/1601653137399/AI+Readiness+Report.pdf
9 (n8)
10 Ibid
11 Distributed Ledgers and Artificial Intelligence Taskforce, Emerging Digital Technologies for Kenya: Exploration and Analysis (2019)
https://www.ict.go.ke/blockchain.pdf
12 Ibid

undermine rights such as privacy and freedom of expression and association. It is a great concern that Africa lacks a unified international framework that provides guidance on AI ethics that should be observed.[13] Kenya also lacks a legal framework governing AI. The Government has not developed an AI strategy. The Data Protection Act, 2019[14] is the only law that can be relied on in terms of protection of data processed by AI systems. The African Union Convention on Cyber Security and Personal Data Protection[15] also governs processing of personal data by AI systems.[16]

This policy brief seeks to examines the impact of AI systems in Kenya on human rights. It begins by giving an outline of the application of AI in crucial sectors in the country i.e., agriculture, health, education, and finance. It then looks at the challenges faced in the adoption of AI in Kenya, followed by the risks posed on human rights, and concludes by making recommendations on measures that can be adopted by the Government to prevent the violation of human rights by these systems.

13 Arthur Gwagwa, Recommendations on the Inclusion of sub-Saharan Africa in Global AI Ethics (Research ICT Africa 2019)
https://researchictafrica.net/wp/wp-content/uploads/2020/11/RANITP2019-2-AI-Ethics.pdf
14 Data Protection Act 2019 (N0.4 of 2019)
15 African Union Convention on Cyber Security and Personal Data Protection
https://au.int/sites/default/files/treaties/29560-treaty-0048_-_african_union_convention_on_cyber_security_and_personal_data_protection_e.pdf
16 Article 9 (1) (b), AU Convention on Cyber Security and Protection of Personal Data

AI UTILIZATION IN KENYA

AI has the potential of boosting the country's economy and solving prevalent problems across various sectors. Its application can transform delivery of government services, improve the healthcare system, increase food supply, enhance education, among others.[17] According to research conducted recently by CIPIT on the utilization of AI in Africa, AI has 49 applications in Kenya.[18] These applications cut across 15 sectors which include among others; agriculture, health, finance, education, businesses, and security.[19] This Policy Brief will look at four key sectors - agriculture, finance, health, and education.

AGRICULTURE

Agriculture is a crucial sector in Kenya's economy and contributes greatly to the country's GDP. Given the country's growing population and increased need for food supply, agriculture plays a critical role in meeting the needs of the growing population.

Kenya's agricultural sector has several AI applications designed to meet these needs. These include the Third Eye project which uses drones to monitor soil needs and identify pests and diseases in crops.[20] It detects minute changes in crops that are not easily discerned by humans and enables early detection which saves crops. [21]Other notable applications are Nuru[22] and Eska. These applications rely on AI in detecting pests and diseases in crops. Eska, for example, analyses crop photos and gives instant information on the health of crops.[23] Vital signs gives farmers an estimation of rain and drought patterns through satellite imagery thereby enabling them to plan.[24] Arifu uses an AI chatbot through SMSs, WhatsApp, and Facebook Messanger to provide farmers with key information such as suitable fertilizer for their soil.[25] Farm Drive on the other hand offers credit to farmers and relies on their farm information such as the size of their land, crops, and location, to determine their credit worthiness. [26]

These platforms are mostly privately owned and include collaborations between local institutions and international organizations. Some are collaborations between international organizations and Government institutions. The Third Eye Project for example is a product of a partnership between the Netherlands Development Agency and Jomo Kenyatta University (JKUAT).[27]

FINANCE (FINTECH)

AI is heavily relied upon in fintech (digital lending apps) in determining whether or not to grant loans to borrowers .[28] AI through machine learning in this case is used to determine a borrower's likelihood of default through assessment of a borrower's micro-behavioural data[29] and assessment of information obtained from the borrower's device including contacts, SMSs, SD card content, gallery, and apps downloaded in the device.[30]

Fintech, particularly digital lending apps, use this

17 Judy Kabubu, 'Artificial Intelligence (AI) in Kenya' (2021) https://mman.co.ke/content/artificial-intelligence-ai-kenya

18 Center for Intellectual Property and Information Technology Law (CIPIT), 'How is AI Being Utilized in Africa: Mapping of AI Applications in Africa' (2021) https://app.powerbi.com/view?r=eyJrIjoiYjc5NTQyMzQtNTFiZS00ZTdjLTkwMmMtZWZkOGU3Njk1ZjM2IiwidCI6IjdhNTNiMjZhLTI1YTUtNGNiYS05NGM4LTM4ZWFlMWY3MzVjYSJ9&pageName=ReportSection

19 Ibid

20 (n17)

21 (n17)

22 Nuru https://nuruinternational.org/where-we-work/nuru-kenya/

23 Adil El Youssefi, 'Artificial Intelligence is Revolutionizing Agriculture' (2018) https://nairobigarage.com/artificial-intelligence-is-revolutionising-agriculture/

24 Ana Brandusescu, Juan Ortiz Freuler, Dhanaraj Thakur, Artificial Intelligence: Starting the Policy Dialogue in Africa (World Wide Web Foundation 2017) 4

25 Ibid

26 Ibid

27 Allan Mungai, 'The Future of Artificial Intelligence in Agriculture' Standard Newspaper

28 Oliver Nieburg, 'Will AI Risk Analysis Really Expand Access to Credit in Africa' (2021) https://www.theafricareport.com/107432/will-ai-risk-analysis-really-expand-access-to-credit-in-africa/

29 Ibid

30 Grace Mutung'u, Kevin Muchwat, Privacy and Data Protection Practices of Digital Lending Apps in Kenya (CIPIT 2021) https://cipit.strathmore.edu/privacy-and-data-protection-practices-of-digital-lending-apps-in-kenya-report/

information to determine a borrower's credit score and determine suitable loans for them.[31] Fintech relies on this information due to the fact that they don't obtain security from borrowers compared to traditional financing institutions like banks. Their business model enables them to provide loan facilities to the unbanked population which may lack security to access loans from banks.

HEALTH

AI is being used to address challenges faced in the medical sector. It is being used in rural areas for example, in the detection of diseases such as cervical cancer in women.[32] It also has other applications. These include AfyaRekod which is being used by medical personnel to collect real time information about patients' health to provide them with the required medical attention.[33] This application was developed further in 2020 to help in the fight against the COVID-19 pandemic.[34] Tambua Health is also another application that is employed by medical personnel in the diagnosis and treatment of cardiopulmonary diseases. It relies on machine learning to analyse the sound of a patient's lung and heart to detect cardio pulmonary diseases.[35] Sophie Bot is also an AI application that uses a chatbot to provide users with information regarding their reproductive health.[36]

These projects are mostly initiatives deployed by the private sector. AfyaRekod, for example, has been founded by a sole proprietor in partnership with other national and international organizations.[37]

EDUCATION

In Kenya AI has several applications in the education sector. These include Angaza Elimu, which is a UNICEF funded eLearning platform that relies on AI to provide students with personalized learning experience designed to meet their needs.[38] It gives students access to learning notes and assignments designed to fit their unique learning experience and enables them to track their performance.[39] It also enables tutors to assess students' capabilities and provide them with customized learning resources.[40]M-Shule is also another application in the education sector, which is an SMS based platform that enables organizations to deliver learning, evaluation, and data tools.[41]

31 David Medine, Gayatri Murthy, Making Data Work for the Poor: New Approaches to Data Protection and Privacy (CGAP 2020) 5
https://www.cgap.org/sites/default/files/publications/2020_01_Focus_Note_Making_Data_Work_for_Poor_0.pdf
32 (n38)
33 AfyaRekod
https://afyarekod.com/
34 Kenyan Healthcare Startup to Launch AI, Blockchain-Driven Platform in Support of Global Effort to Curb COVID-19
https://www.logupdateafrica.com/-kenyan-healthcare-startup-to-launch-ai-blockchaindriven-platform-in-support-of-global-efforts-to-curb-covid19-technology
Afya Rekod
https://afyarekod.com/
35 Tambua Health
https://www.tambuahealth.com/
36 (n39)
37 AfyaRekod
https://afyarekod.com/
38 Angaza Elimu
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39 Angaza Elimu
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40 Angaza Elimu
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41 M-shule
https://m-shule.com/

CHALLENGES FACING ADOPTION OF AI IN KENYA

Despite the myriad benefits that AI promises, it still faces challenges in its adoption in Kenya. These challenges include the lack of data, adequate regulation, skill gap, connectivity, and investment in research. These challenges derail the further development of AI in the country and if left unaddressed, they will deny major sectors the various benefits they stand to benefit from AI.

LACK OF DATA

AI and Machine Learning are heavily reliant on data. They rely on data for the training of algorithms[42] and production of desired outputs. Without sufficient data AI systems cannot be effective and can be rendered useless.[43] Kenya however, faces the challenge of unavailability of data.[44] The country lacks data that can be utilized to train AI algorithms. According to the Nation Newsplex Analysis on AI in Kenya[45]The country "ranks 78 out of 94 countries globally with a score of 15% in the Global Open Data Index 2016/17 which measures availability of Government data to the public".[46] It also takes the seventh position in the openness of Government Data.[47] However, despite the critical role that data plays in the development of AI systems, compliance with the Data Protection Act, 2019 is key. The principles established on the processing of personal data in the Act should be observed. However, these principles should be employed in a manner that stifles AI innovation.

SKILLS GAP

The realization of AI benefits in Kenya strongly requires necessary skills among the workforces that can foster utilization of AI. This means that the country requires individuals with adequate skills in AI to develop relevant AI solutions across various sectors. These skills can only be developed at the education level through STEM (Science, Technology, Engineering, and Math) courses offered at the secondary and tertiary level.[48]

However, the uptake of STEM courses in Kenyan universities is worrying. The Nation Newsplex Analysis on AI in Kenya indicates that only 1 in 4 university graduates has done a STEM course, with only a third currently enrolled in the same.[49] This gap is also seen in the continent's higher education institutions where it is reported that less than 25% of graduates have focused on STEM courses.[50]It is not clear what the public perception of AI is in Kenya and whether this contributes to the low uptake of STEM courses.

It is worth noting that the low uptake of STEM courses brings about a skills gap particularly in times like these when companies are actively taking up AI and are in high demand of AI professionals.[51] There is therefore a need for the education system to promote uptake of STEM courses to match the need for the new tech job market and to bring up a crop of researchers that can develop AI solutions in the country.

REGULATORY ENVIRONMENT

AI currently lacks a regulatory framework in Kenya. The government commissioned a Blockchain and AI Taskforce in 2018 to provide directions on the utilization of AI in the country.[52] The commission found that the lack of regulation created risks around

42 (n1)
43 Isaac Rutenberg, Arthur Gwagwa, Melissa Omino, 'Use and Impact of Artificial Intelligence on Climate Change Adaptation in Africa' (2021)1122
https://link.springer.com/chapter/10.1007/978-3-030-45106-6_80
44 Joshua Mutisya, 'Kenya Ready for Artificial Intelligence but Where is the Data' Nation Newsplex (Nairobi, 20th August 2020)
https://nation.africa/kenya/newsplex/artificialintelligence/2718262-5383962-1e8os8z/index.html
45 Ibid
46 Ibid
47 Ibid
48 (n3) Pg.26
49 (n56)
50 (n3) pg.26
51 Richard Samans, Saadia Zahidi, The Future of Jobs and Skills in Africa: Preparing the Region for the Fourth Industrial Revolution (World Economic Forum 2017) 11
https://www3.weforum.org/docs/WEF_EGW_FOJ_Africa.pdf
52 Muthoki Mumo, 'Tech Dream Team to Produce Kenya's Blockchain Roadmap' Business Daily (Nairobi, 28 February 2018)
https://www.businessdailyafrica.com/corporate/tech/Ndemo-taskforce-Kenya-blockchain-roadmap-ICT/4258474-4323074-gjwgqnz/index.html

data privacy, weaponization (violation of human rights), and human redundancy.[53] In line with this, the Taskforce recommended the development of policies that promote the development of AI and protect human rights, creation of an enabling AI ecosystem, and analysis of AI risks and putting in place mitigation measures.[54] The Government is, however, yet to establish laws and policies to govern this field.

The lack of regulation leaves the harms brought by AI use unattended and puts human rights at risk. It also slows the development and growth of AI in the country. The Data Protection Act, 2019[55] should also be fully implemented to create trust among users of AI based solutions.[56]

CONNECTIVITY

The usage of AI services heavily relies on broadband connectivity.[57] AI cannot be utilized without internet connection. Its benefits cannot be enjoyed without the internet. Kenya is positioning itself to partake of these benefits, however, internet connectivity remains to be a major setback. According to the GSMA State of Mobile Internet Connectivity 2021 Report, only 37% of Kenya's population is connected to the internet[58] with a major gap being seen in rural and urban areas[59]. Though this can be said to be steady rise from the previous years[60], the number of people not connected to the internet still remains high.

The connectivity gap in Kenya is caused by several factors including high cost of the internet and mobile devices, low levels of digital literacy, and lack of infrastructure. Failure to address these issues may lock out many people from the use of services afforded through AI. It may also become a drawback to the benefits that the Government intends to accrue from AI and the country's economy. The benefits of AI can be fully leveraged when people are connected to the internet.

INVESTMENT IN RESEARCH

Development of AI in Kenya is further derailed by the lack of investment by the Government in AI research. Currently, there are no government funded AI research projects in the country. Most AI research programs are being funded by international organizations keen to advance AI adoption.[61] Microsoft for example has established a research base called the Microsoft Africa Research Institute (MARI) which is keen on building and deploying AI technologies.[62] The research institute based in Nairobi aims at bringing together researchers, engineers, and designers with a view to developing viable AI solutions.[63] Another example is the IBM Research Laboratory(Nairobi Think Lab)[64] which conducts research on AI to provide solutions in critical areas including education, healthcare, public safety, and financial inclusion.[65]

Lack of investment in AI research deprives the country the opportunity to design AI solutions that meet the most pressing needs, and protect human rights. The Government undertook in the 2019 ICT

53 (n11)42
54 (n11) Pg.44
55 (n14)
56 (n3) 34
57 (n3) 27
58 Anne Delaporte, Kalvin Bahia, The State of Mobile Internet Connectivity 2021 (GSM Association 2021) 17
https://www.gsma.com/r/wp-content/uploads/2021/09/The-State-of-Mobile-Internet-Connectivity-Report-2021.pdf > Accessed on 25/10/2021
59 (n71)16
60 2019 Kenya Population and Housing Census Volume IV: Distribution of Population by Socio Economic Characteristics
Kalvin Bahia, Anne Delaporte, The State of Mobile Internet Connectivity 2020 (GSM Association 2020)15
https://www.gsma.com/r/wp-content/uploads/2020/09/GSMA-State-of-Mobile-Internet-Connectivity-Report-2020.pdf
61 (n7)
62 Microsoft Africa Research Institute (MARI)
https://www.microsoft.com/en-us/research/group/microsoft-africa-research-institute-mari/
63 Ibid
64 IBM Research Laboratory
https://research.ibm.com/articles/africa.shtml
(n7)
65 IBM Research Laboratory
https://research.ibm.com/articles/africa-thinklab.shtml

Policy to fund research in technology for purposes of developing technological solutions that can be used for meeting the needs of Kenya .[66] However, no effort has been made towards this. The Government should, in accordance with Resolution 473 of the African Commission commit itself to undertake research on the impact of AI on human rights.[67]

66 (n81) Pg.31

67 African Commission on Human and Peoples Rights: 473 Resolution on the Need to Undertake a Study on Human and People's Rights and Artificial Intelligence (AI), Robotics and Other New and Emerging Technologies in Africa-ACHPR/Res 473 (EXT/OS/XX1)2021

AI RISKS/ CHALLENGES OF AI ADOPTION

As much as there is so much excitement brought by AI, it also comes with its risks which affect human rights. These risks include loss of jobs, AI bias, surveillance and violation of privacy, weaponization, unlawful content moderation practices, among others. These risks need to be mitigated to enable meaningful use of AI.

UNEMPLOYMENT DUE TO AUTOMATION

AI poses the risk of rendering many people jobless due to automation. This is because most routine tasks will be taken up by automation and the people performing these tasks will be left jobless.[68] According to the Future of Jobs Report by the World Economic Forum, 52% of jobs in Kenya are susceptible to automation.[69]

However, it is important to note that despite the fact that automation will replace most jobs in the job market, "most jobs will be transformed into jobs that require new skills and completely new ones will be created".[70] This means that automation will create jobs that require highly skilled tech-professionals.[71] This will see creation of jobs "in fields such as STEM, data analysis. Computer science, and engineering".[72]

Jobs will therefore demand professionals able to "create, implement, and maintain" AI systems.[73] This however raises concerns given the low intake and low number of graduates in STEM courses in Kenya.[74] There is therefore a need to encourage and promote the uptake of the courses for the full realization of AI use in Kenya.

AI BIAS

Machine learning is based on training algorithms using datasets that direct them on what the correct output should be about people or objects in particular circumstances.[75] These algorithms learn from these data and are eventually able to know the expected output about people and objects in given circumstances.[76] The output produced by these algorithms have however been found to be biased in most cases and unfavorable to particular groups.[77]

The bias in the systems is caused by various factors, such as human bias unintentionally transposed into the AI systems during development, flaws in data caused by factors such as use of historical data that is biased, use of incorrect, inaccurate, insufficient, outdated, or unrepresentative data.[78] Biased outputs have been seen in sectors such as fintech, particularly digital lending apps which rely on automation in analysing micro-behavioural data such as people's browsing history[79], social media information, among others, to determine their credit worth. The analysis by automation has as a result led to unfair credit scores to certain groups particularly women who have less browsing history due to their lack of access to the internet and mobile devices.[80]

SURVEILLANCE

The adoption of AI also provides governments in Africa with an avenue to surveil citizens. This is mainly enabled through facial recognition tools that monitor the activities of citizens, profile them, and locate them.[81] AI surveillance has gained prominence in Africa mainly through the Huawei Safe Cities

68 Jieun Choi, Mark.A.Dutz, Zainab Usman et al, The Future of Work in Africa: Harnessing the Potential of Digital Technologies for All (2020) Pg.23 https://openknowledge.worldbank.org/bitstream/handle/10986/32124/9781464814440.pdf?sequence=11&isAllowed=y
69 (n51) 9
70 (n3) 24.
71 (n51) 9
72 (n51) 9
73 (n3) 24
74 (n44)
75 Nicole Turner Lee, Paul Resnick, Genie Barton, Algorithmic bias detection and mitigation: Best Practices and Policies to Reduce Consumer Harm (Brookings 2019) https://www.brookings.edu/research/algorithmic-bias-detection-and-mitigation-best-practices-and-policies-to-reduce-consumer-harms/
76 Ibid
77 Ibid
78 Lindsay Andersen, Human Rights in the Age of Artificial Intelligence (Access Now 2018) 12 https://www.accessnow.org/cms/assets/uploads/2018/11/AI-and-Human-Rights.pdf
79 (n78) 16
80 Favour Borokini, Sandra Nabulega, Garnett Achieng', Engendering AI: A Gender and Ethics Perspective on Artificial Intelligence in Africa (Pollicy 2021) 17 https://archive.pollicy.org/wp-content/uploads/2021/09/Engendering-AI.pdf
81 (n78) 15

Project which is said to (among other things) aid in the prevention and fight against crimes.[82]

In Kenya, Huawei Safe City connected 1800 HD cameras and 200 HD traffic surveillance systems across Nairobi.[83] The project also saw the establishment of a "national police command center supporting over 9000 police officers and 195 police stations established with the intention of achieving monitoring and case solving".[84] This technology was mainly adopted to enhance public safety.[85] It's Effectiveness in curbing crime within the country however cannot be proven.[86] As a matter of fact the high level of crime in the country is an issue that the government is still grappling with.[87] The technology, contrary to its intended purpose, potentially provides an avenue for the government to surveil citizens and undermine human rights in efforts to stifle dissenting voices and undermine democratic processes.[88]

What's worse is that these technologies are deployed with no transparency and involvement from the public.[89] The Government has been in a quick move to adopt technologies to fix issues without considering the impact of their use.[90]Another concern raised by facial recognition systems in these technologies is that there's lack of clarity on the government's use of data in the image databases, and lack of clarity on where the images are obtained.[91] The Safe City projects have been repressively employed in other countries in Africa such as Uganda and Zambia to repress political opposition and even to track individuals opposing the Government.[92]

GENDER INEQUALITY

AI promises significant benefits to the country's economy, however these benefits stand a risk of not being fully realized due to the gender inequality faced by women in terms of AI use. Gender inequality by AI is perpetuated in several forms. These include bias against women caused by AI algorithms[93], the low number of women in the AI ecosystem that is academia and AI workforce[94], and the low number of women accessing the internet and owning mobile phones coupled with the low levels of digital literacy.

Bias against women is caused by several factors such as training AI algorithms with datasets that are inaccurate, inadequate, under-representative, and historical.[95] It is also caused by transmission of bias in the systems by developers, which in most cases is unintentional.[96] The use of this has had

82 Bulelani Jili, 'The Spread of Surveillance Technology in Africa Stirs Security Concerns' (2020) https://africacenter.org/spotlight/surveillance-technology-in-africa-security-concerns/

83 Ibid

84 Steven Feldstein, The Global Expansion of AI Surveillance (Carnegie Endowment for International Peace 2019) 18 https://carnegieendowment.org/files/WP-Feldstein-AISurveillance_final1.pdf

85 Ibid

Bulelani Jili, The Spread of Surveillance Technology in Africa Stirs Security Concerns (December 11, 2020) https://africacenter.org/spotlight/surveillance-technology-in-africa-security-concerns/

86 Jonathan E.Hillman, Maesea McCalpin, 'Watching Huawei's "Safe Cities"' (2019) 2 https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/191030_HillmanMcCalpin_HuaweiSafeCity_layout_v4.pdf

87 Office of the Inspector General National Police Service, Annual Crime Report 2018 https://www.nationalpolice.go.ke/crime-statistics.html

88 (n84) 16

89 Victor Kapiyo, Grace Githaiga, 'Is Surveillance a Panacea to Kenya's Security Threats?' (GIS Watch 2014) 151 https://giswatch.org/sites/default/files/is_surveillance_a_panacea_to_kenyas_security_threats.pdf

90 Ibid

91 (n 84) 18

92 The Wall Street Journal, Huawei Technicians Helped African Governments to Spy on Political Opponents https://www.wsj.com/articles/huawei-technicians-helped-african-governments-spy-on-political-opponents-11565793017 > Accessed on 27/10/2021

93 Arthur Gwagwa, Erika Kraemer-Mbula, Nagla Rizk, Isaac Rutenberg, Jeremy De Beer, 'Artificial Intelligence (AI) Deployments in Africa: Benefits, Challenges, and Policy Dimensions' (AJIC Issue 26, 2020) 7 http://www.scielo.org.za/pdf/ajic/v26/02.pdf

94 (n80) 16

Daniel Zhang, Saurabh Mishra, Erik Brynjolfsson, John Etchemendy, Deep Ganguli, Barbara Grosz, Terah Lyons, James Manyika, Juan Carlos Niebles, Michael Sellitto, Yoav Shoham, Jack Clark, and Raymond Perrault, "The AI Index 2021 Annual Report," (AI Index Steering Committee, Human-Centered AI Institute, Stanford University, Stanford, CA, March 2021) 137

95 (n 80) 16-17

96 Sarah Kiden.(2019). Gender and Artificial Intelligence Readiness in Africa. Research ICT Africa. Pg.2 &8 https://researchictafrica.net/wp/wp-content/uploads/2020/11/RANITP2019-4-AI-Gender.pdf

the effect of exacerbating the existing societal bias against women and making AI systems to produce results that are less favorable to women particularly in sectors such as finance.[97] Data such as historical data extends societal marginalization against women into AI systems.[98] Reliance on such data by African countries is caused by the reluctance of collecting data that is representative of women.[99]

Gender inequality is also caused by the low number of women in the AI field i.e., academia and the AI workforce.[100] A study conducted by CIPIT on gender inequality in the AI ecosystem in Africa indicates that the gender gap between men and women in AI stands at 71-29%.[101] It also indicates that men dominate the AI workforce where only 10% of women are founders of AI companies, and only 13% hold CEO positions.[102] The study indicates that cumulatively, the gender gap between men and women in management positions stands at 90-10%.[103] The resultant effect of this is that AI systems get to be developed without leveraging the women's experience and without considering their needs.[104] The low participation of women in the AI ecosystem is caused by the gendered approach towards STEM courses where society believes that women can't be good, lack of motivation to women to take STEM courses, and the unfavorable culture in the AI workforce.[105]

Gender inequality in the use of AI systems developed across critical sectors is also caused by the lack of access to internet connectivity by women and the low number of women owning mobile devices. Affordability of data is also another issue. If AI is to be fully utilized then the government should concentrate on bringing more women online.

WEAPONISATION

Governments in Africa have weaponized AI and are using it to shape public opinion and political discussions.[106] They are using it to spread pro-government propaganda and smear the campaigns of political opponents.[107] AI through social media platforms is being actively used during election periods for manipulating the public and further fueling ethnic and religious divisions across countries.[108]

This is made possible through the use of chatbots, deep fakes, and AI algorithms that proliferate the reach of these content through analysis of content engagement. Further Governments have been heavily relying on social media platforms for targeting users with manipulative content through creation of profiles based on user sensitive information such as ethnicity, gender, religion, and age. This as a result has had the effect of fueling tension in the country and exacerbating the existing ethnic and religious divide.

In 2017 Cambridge Analytica was employed by the Government to smear the campaigns of the then political opponent Raila Odinga where citizens were micro-targeted with horrific messages portraying Raila Odinga as a tribalistic leader who would mistreat certain tribes. The messages were aimed at creating fear among citizens and dissuading them to vote for the Government's political candidate. The messages were targeted at specific people based on

97 (n 80) 17
98 Ibid
99 Ibid
100 Daniel Zhang, Saurabh Mishra, Erik Brynjolfsson, John Etchemendy, Deep Ganguli, Barbara Grosz, Terah Lyons, James Manyika, Juan Carlos Niebles, Michael Sellitto, Yoav Shoham, Jack Clark, and Raymond Perrault, "The AI Index 2021 Annual Report," AI Index Steering Committee, Human-Centered AI Institute, Stanford University, Stanford, CA, March 2021. Pg.137
101 CIPIT, Gender and AI
https://cipit.strathmore.edu/artificial-intelligence/#1603973135790-9e18a460-f4a7
102 Ibid
103 Ibid
104 (n 80) 16
105 Shamira Ahmed, A Gender Perspective on the Use of Artificial Intelligence in the African Fintech Ecosystem: Case Studies from South Africa, Kenya, Nigeria, and Ghana (International Telecommunications Society 2021)
https://www.econstor.eu/bitstream/10419/238002/1/Ahmed.pdf
106 Samantha Bradshaw, Philip N.Howard, The Global Disinformation Order: 2019 Global Inventory of Organised Social Media Manipulation (Oxford Internet Institute 2019) 1
https://demtech.oii.ox.ac.uk/wp-content/uploads/sites/93/2019/09/CyberTroop-Report19.pdf
107 Ibid
108 Velomahanina Tahinjanahary Razakamaharavo, 'Implications of Emerging Technologies on Peace and Security in Africa' (2021)
https://www.accord.org.za/conflict-trends/implications-of-emerging-technologies-on-peace-and-security-in-africa/

their ethnicity, gender, religion, and age.[109]

DATA PROTECTION

AI systems rely on large amounts of data in order to learn and perform their functions effectively.[110] They process personal data in two phases, that is the 'algorithmic training phase' and the 'use phase'.[111] The algorithmic training phase involves the training of AI algorithms using datasets that enable them to 'recognize patterns, make predictions, and execute actions'.[112] The use phase on the other hand involves the application of the AI system to its designated purpose which may include classification, making predictions or assisting in decision making. [113]

The development of AI systems such as the ones demonstrated in this Policy Brief is pegged on collection and analysis of all relevant available data.[114] Such AI systems require both personal and sensitive data. This may include health, gender, and other sensitive data. Denying them access to such kind of data may result in them producing biased outputs or discrimination.[115]

Their heavy reliance on personal data raises concerns on privacy and data protection. However, it is important to note that without data, these systems cannot operate. Therefore there should be a careful application of the Data Protection Act to strike a balance between their development and protection of data .[116] In this case, it is important to design the application of the Data Protection Act to AI in order "avoid burdening it with unnecessary regulatory requirements or with uncertainty about which regulatory requirements apply".[117] The data protection Act "should be applied in a technology neutral manner and should provide regulatory clarity for developing AI technology".[118]

There should be a reasonable application of the data protection principles such as principles of purpose limitation and collection limitation in order to advance AI.[119]

CONTENT MODERATION

AI is relied upon for automated content moderation in online spaces where it is applied to detect, curate, and remove content.[120] Its use involves the training of algorithms through machine learning models which enable them to take automated actions and make decisions regarding content in online spaces. It is employed in content moderation mainly to target hate speech, disinformation, and content that affect democratic processes. As much as it can be effective in regulating content, it also carries the risk of undermining human rights (such as freedom of expression and access to information)[121] through taking down relevant content and leaving unwanted content online.

This is brought about by critical factors around the design, development, and training of the AI system.[122] Training AI systems on data that is biased and inaccurate, may result in magnification of content that is harmful to the public, or deletion of content

109 Ibid
110 Artificial Intelligence Data Protection: Delivering Sustainable AI Accountability in Practice (Center for Information and Policy Leadership (CIPL) 2018) 18 https://iapp.org/media/pdf/resource_center/artificial_intelligence_data_protection.pdf
111 Artificial Intelligence and Data Protection: How the GDPR Regulates AI (Center for Information Policy Leadership (CIPL) 2020) https://www.informationpolicycentre.com/uploads/5/7/1/0/57104281/cipl-hunton_andrews_kurth_legal_note_-_how_gdpr_regulates_ai__12_march_2020_.pdf
112 (n10)
113 (n10)
Giovanni Sartor, The Impact of the General Data Protection Regulation(GDPR) on Artificial Intelligence (European Parliamentary Research Service(EPRS) 2020) 1 https://www.europarl.europa.eu/RegData/etudes/STUD/2020/641530/EPRS_STU(2020)641530_EN.pdf
114 (n 109)13
115 (n 109)14
116 Ibid
117 (n 109)12
118 Ibid
119 Ibid
120 Sahana Udupa, Elonai Hickok, Antonis Maronikolakis, et al, Artificial Intelligence, Extreme Speech, and the Challenges of Online Content Moderation (AI4Dignity Project 2020) 6 https://www.disinfobservatory.org/wp-content/uploads/2021/06/AI4Dignity-AI-Extreme-Speech-Policy-Brief.pdf?utm_expid=.XqNwTug2W6nwDVUSgFJXed.1
121 Ibid
122 (n 119)

that is relevant to the public.[123] AI systems particularly in African countries are designed based on data that does not reflect the realities of African countries and do not address disinformation and hate speech in the African context. A co working group organized by the Meedan Team, Article 19, and the National Democratic Group on the topics of hate speech, disinformation, and content moderation found that" social media global standards of content moderation do not represent how hatespeech, misinformation, and disinformation, manifest in the Kenyan context".[124] This coworking group found that the hate speech and disinformation disseminated online during the Kenyan 2017 election largely remained online despite being reported to the major social media platforms.[125]There also lacks transparency and accountability by social media platforms on how they regulate content.

123 (n 119)
124 Kat Lo, 'Content Moderation Toolkit' (2020)
https://meedan.com/reports/executive-summary/
125 Isaac Rutenberg, Abdulmalik Sugow, Regulation of the Social Media in Electoral Democracies: A Case of Kenya (SOAS Law Journal (SLJ) 2020) 303
https://www.cipit.strathmore.edu/wp-content/uploads/2020/06/Journal-7.pdf

CONCLUSION AND RECOMMENDATIONS

GOVERNMENT

- The Government should create a regulatory framework around AI that addresses the human rights implications of AI. The framework should strike a balance between promoting AI innovation and protecting human rights.
- The Government through the Ministry of ICT should invest in AI research to find ways of mitigating risks to human rights caused by AI use.
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- The Government, through the Ministry of ICT should initiate the digitization of records which are mostly in hard copy to create relevant data for development of AI systems.
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- The Ministry of education in collaboration with civil society and actors in the private sectors should encourage the uptake of STEM courses. The Government should also introduce STEM courses at the secondary level for early introduction of students to the AI industry.
- The Government should invest in broadband connectivity to enable many people (particularly the unconnected) to use AI systems.
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- The Government should avoid weaponisation of AI and use of AI for surveillance purposes.

CIVIL SOCIETY ORGANIZATIONS

- The civil society should work together with the Government for the creation of a rights respecting AI framework.
- The civil society should also advocate against the harms caused by AI systems to human rights to create awareness.

PRIVATE SECTOR

The private sector in developing AI systems should use datasets that are free of bias to mitigate AI bias. Automated content moderation should be based on data that is free of bias, and should be conducted in a transparent manner and companies should be held accountable.