Artificial Intelligence Evaluation Criteria

Artificial intelligence (AI) has begun to create change in social and economic processes across developed markets, and has the potential to drive game-changing improvements for underserved communities in developing countries. There is growing recognition of the tremendous potential of AI tools to break fundamental tradeoffs in access, quality, and cost.

While this excitement is welcome, we feel there is too much hype and not enough analysis. Specifically, we need to stay ahead of the curve in our understanding of how to effectively deploy and scale AI solutions across low- and middle income countries (see the Resources section below).

As international development communities know from prior experience, it is very challenging to take disruptive technology innovations from high-income countries and deploy and scale them so that they address the unique needs of, and have positive impacts on, populations in low-income environments, while those populations also having a measure of control over the technologies.

What is Artificial Intelligence?

For the purposes of this effort, we will use a common definition of AI as "the use of computers for automated decision-making to perform tasks that normally require human intelligence," and we will include a set of 'AI building blocks' or technologies that are commonly understood as examples of AI, listed below.

Data
- *Computer vision:* Automated methods used to conduct image-based inspection and analysis
- *Speech recognition:* Computerized identification and response to sounds produced in human speech
- *Natural language processing:* Processing and analysis of large amounts of data written in natural language (eg. narrative)

Processing
- *Information processing (in AI):* Processing of digitized data in ways parallel to human brain functions
- *Machine learning:* Pattern recognition that learns and improves from experience without being programmed
- *Planning & exploring agents:* Use of AI for strategies or action sequences by agents, robots, or unmanned vehicles

Action
- *Image generation:* Automated creation of images using AI
- *Speech generation:* Automated generation of human-like speech using AI

- *Handling and control:* Automatic handling of objects using AI methods
- *Navigating and movement:* Autonomous movement and navigation informed by AI

Evaluation Criteria

All efforts to drive acceleration of AI in international development should be undertaken in alignment with the broader principles and best practices for technologies that have been developed in recent years, and specifically the [Principles of Digital Development](#).

Chief among these principles is the notion that adoption, acceleration, and use of AI technologies should strengthen local systems and must be owned and driven by the needs and priorities of LMIC governments and stakeholders in order to help them best serve the needs of their populations. Therefore, these criteria, their definitions, and especially their application should be adopted to suit the context in which they are used.

The following evaluation criteria were developed by starting with the [Principles of Digital Development](#), and then adding context through literature review, discussions with key informants, and input from [Technology Salon](#) members.

The goal is to build on the Digital Principles with *additional* questions or concerns that are specific to AI.

The original version of this document [can be found here](#).

Design With the User

User-centered design starts with getting to know the people you are designing for through conversation, observation and co-creation. [More here](#).
- Is the problem addressing foundational issues relevant to low and middle income countries, or is it only expect to serve rich countries?
- Are criteria designed by those whose data will be used to train the AI?
- Will those whose lives will be impacted by decisions the AI make be involved in the evaluation process?
- Will the AI exacerbate vulnerabilities among constituents (particularly under-represented, underserved, or vulnerable)? Who is responsible for taking that decision, and what criteria should they consider in reaching it?
- What are the power dynamics in AI decision-making given the high math/computational requirements to understand and develop AI algorithms?
- How will the decisions made using the algorithm be evaluated?
- Are the decisions that are informed by AI understandable and well-communicated?

Understand the Existing Ecosystem

Well-designed initiatives and digital tools consider the particular structures and needs that exist in each country, region and community. [More here](#).

- Who is defining the problem statement that the AI solution is proposed to address?
- What are private sector players doing on this problem in the target ecosystem already?
- Will the results lead to information that is actionable or even useful by its participants?
- What are the job impacts? Will displaced workers be hired elsewhere?
- How do we apply existing human rights principles and national laws? (And who enforces norms that are not codified in relevant national laws?)
- For AI that involves humans, has it passed the relevant Institutional Review Boards?
- How does an AI project that uses public money (e.g. foreign aid) contribute to a local public good in some way (such as by contributing to local-language ML libraries, building indigenous ML/data science talent, building data interpretation skills, etc)?
- How are historically underrepresented voices accounted for in both the creation and ongoing validation of an algorithm?
- How does the General Data Protection Regulation (GDPR) impact the AI solution?

Design for Scale

Achieving scale requires adoption beyond an initiative's pilot population and often necessitates securing funding or partners that take the initiative to new communities or regions. [More here](#).

- Is there really AI expertise on the team? Will they stay long enough to get scale?
- Will the AI solution require capacity-building to be taken to scale? If so, is it planned for in the pilot concept?
- What is the level of familiarity with AI risks and rewards among stakeholders?
- How is data managed as program grows and produces large scale data sets?
- How can citizens themselves can exploit open data and processes to make their own use for accountability?
- What are the advocacy approaches to different stakeholders for scale up of AI?
- Is there ways to attract and maintain skills in government to scale up AI?

Build for Sustainability

Building sustainable programs, platforms and digital tools is essential to maintain user and stakeholder support, as well as to maximize long-term impact. [More here](#).

- What's the value of getting things right? What's the cost of getting things wrong? How do we balance them?
- Can the AI solution be integrated into the intended context?
- How might behavioral economics and behavioral indicators inform and evaluate AI?
- What is the long-term cost of ownership?
- Are there local human resources trained and available to assist with continuing the AI?
- How do country governments 'buy-in' to the AI solution over the long term?

- Does the country, or region, have a technology hub that could help shepherd the development and potentially ownership of any AI-linked solution?
- Who owns the ongoing maintenance of the model? What incentives and disincentives do they face when making choices about the model? How do those compare to the incentives/disincentives that those affected by the model would choose?

Be Data Driven

When an initiative is data driven, quality information is available to the right people when they need it, and they are using those data to take action. [More here](#).

- Is it actually AI or just a statistical model or worse, marketing?
- Is quality data available and accessible in a format that is functional?
- Do we trust the data enough to use it to train our model?
- How biased is the data, since *all* data is biased somehow? What is the social construct that creates the bias being demonstrated in the data?
- To what extent are proxies used and how representative are they of the research population?
- Is there sufficient domain expertise allocated to models to inform essential feature context?
- Is there a "gold standard" available against which we can test the validity of this AI algorithm? If not, can we develop an adaptable standard that draws on country context?

Use Open Standards, Open Data, Open Source, and Open Innovation

An open approach to digital development can help to increase collaboration in the digital development community and avoid duplicating work that has already been done. [More here](#).

- Are algorithms transparent and auditable to stakeholders?
- Is the algorithm being made available to the public for others to utilize?
- Can we use fake data to reproduce the results?
- Are known biases documented? How do we test bias, especially in open data?
- How are indigenous skills, talent, interest, and organizations included in the development of the algorithms?
- How do we locate ownership of the data with the community/people who generated it?
- To what extent does the particular algorithm used lend itself to interpretability? If an approach is used where explicit interpretation is harder (or impossible), what other options exist to fill this gap?
- Data propriety, algorithm propriety and usage of data and results

Reuse and Improve

Reusing and improving is about taking the work of the global development community further than any organization or program can do alone. [More here](#).

- Are NGO AI approaches, including NGO-Private sector partnerships, shared within 'the community', such as at conferences, in whitepapers, etc. for others to build on?

- Are data available and presented so that citizens and third parties can reuse them?

Address Privacy & Security

Addressing privacy and security in digital development involves careful consideration of which data are collected and how data are acquired, used, stored and shared. [More here](#).

- How are the large quantities of data required for AI to achieve "intelligence" secured?
- Who owns the training data? The algorithms? The outputs?
- To what extent is data depersonalized or anonymized and when?
- How is personal data protected throughout the AI lifecycle/ecosystem?
- Are there appropriately communicated and relatively pain-free avenues of recourse for beneficiaries/subjects to ask for data to be deleted or changed?
- What is the worst thing that can happen with the data collected?
- Do you need to collect all the data you are currently collecting?
- What feedback loops would drive the algorithm to converge on a flawed solution?
- Are there alternative methods that could work with less risk?

Be Collaborative

Being collaborative means sharing information, insights, strategies and resources across projects, organizations and sectors, leading to increased efficiency and impact. [More here](#).

- Is there a standard, regular way to review these principles, especially among the members of the development community actively deploying AI-led solutions?
- Should other groups such as GODAN (Global Open Data for Agriculture and Nutrition) be consulted?

Resources

We are greatly indebted to those who came before us. Primary resources for this document include:

- [Artificial Intelligence in Global Health](#): a groundbreaking report supported by The Rockefeller Foundation, USAID Center for Innovation and Impact, Bill & Melinda Gates Foundation, and Boston Consulting Group
- [Principles for Digital Development](#): a set of living guidance intended to help practitioners succeed in applying digital technologies to development programs, currently stewarded by DIAL.
- [Reflecting the Past, Shaping the Future: Making AI Work for International Development](#) by the USAID Center for Digital Development
- [Responsible AI Practices](#) by Google
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