AI for Development is a Malapropism

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Abstract**—** *Artificial Intelligence (AI) has increasingly been included in the range of enabling technologies and tools that support and streamline the process of Development. This led to the promotion of domains such as AI for Good, AI for the Poor or AI for Development (AI4D). But, doing so, it is implicitly assumed that AI complies with the distinctive features of ICT4D such as affordability, relevance, openness and ownership. In this paper, it is shown that AI does not fulfil most of these characteristics and that the term AI4D does not seem to be grounded. To a certain extent, the use of this acronym is misleading and against the fundamentals of the Technology for Development. Decision makers in developing countries shall ponder all factors related to the use of AI and embrace a wider perspective in elaborating and sustaining their national digital transformation strategies.*

Keywords**— *Artificial Intelligence, AI4D, ICT4D, Technology for Development, National Digital Transformation Strategies.***

I. INTRODUCTION

Actors involved in ICT4D (Information and Communication Technology for Development) can be naturally tempted to include Artificial Intelligence (AI) in the range of enabling technologies and tools that may support and boost the Development process. This may be a legitimate expectation. Yet, promoting AI for Development (AI4D) raises numerous problems since it assumes that AI complies with the very specific features of the ICT4D context, including, among others, affordability, relevance, openness, and ownership. Unfortunately, today's AI fulfils none of these, and the enthusiastic posture that AI4D is a natural part of ICT4D is not grounded and, to a certain extent, does not serve the purpose of Technology for Development.

With the purposes and goals of today's AI technology, it is difficult to elaborate a research proposal where an AI application/tool is used to primarily serve the purpose of Development, without explicitly admitting (and contributing) to some amalgamations and/or maline abstractions, including: technology misconception, mixing the application domain and the technology type, stating/defending general human rights, social and societal values and principles, and how technology could support these, regardless of whether this technology is ICT4D or not.

Considering the current race that takes place in developing countries and aims at elaborating digital transformation strategies using AI as a core technology (Government of India, 2018), it is timely and useful to (re)put things in the appropriate context, and define/understand their meaning, contrast them, and conclude as to how fit these are within the Development context and constraints. It is not healthy to adopt a technology just because it is new and/or because vendors pretend it can solve all our problems. Rather, we believe that policymakers (in developing countries, particularly) should concentrate on the actual needs (of the country and the population) and to define them independently of any specific technology nature or type. Then, they could prioritize ICT4D (Model, Techniques and Tools), as the main enabler for the digital transformation process of their countries.

II. INFORMATION AND COMMUNICATION TECHNOLOGY FOR DEVELOPMENT

The ICT4D theory is grounded in the notions of "development", "growth" and "progress", and is often interpreted as the use of technology to streamline and boost the process of development in developing countries (Heeks 2017) (Zheng et al. 2018). Because of their ubiquitous nature, ICTs are being used everywhere to do almost everything, quickly and accurately. Today, the automation spectrum is so large and deep that there isn't a single human activity that is not impacted, one way or another,

including: schooling, trading, gaming, chatting, etc. Wealth has been increasingly generated and maximized via flows of information, data, and knowledge, in a "globalized" World, and ICTs' continuous advances, expansion and adoption led to structural transformations in the economy landscape, with inequalities that widened and widened between individuals, communities and countries, leading to what is known as the digital divide, which is the gap between countries with an effective access to/usage of digital and information technology and those with very limited or no access/usage at all (Norris, 2001).

The digital divide is closely related to the knowledge divide since the lack of access to ICTs makes the access to information and knowledge a real challenge. Several studies also showed that the digital divide is linked to other human development divides (Norris, 2001). They pointed out two contradictory facets of technology: a "positive" facet enabling the boosting of economy, business and public administration, and a "negative" facet consolidating the digital divide, the isolation of regions/populations and degradation of their life conditions (Unwin 2017).

Research on ICT in developing countries emerged in the 1980s, with studies of computer diffusion in various countries and studies of government policy about the use of computers in various sectors. Early researchers of what came to be known as 'ICT for development' (ICT4D) shared the belief that computers can solve many of the severe problems confronting developing economies and societies, such as grossly inefficient government administration, inadequate provision of health care and education and inability to compete in a global economy (Avgerou 2017). The interest in correlating ICTs and Development started around the eighties of the last century, when the International Telecommunication Union delivered a commissioned report entitled "The Missing Link" which noted the urgent need to pursue telecommunication reforms in order to extend the coverage of telephony (and its effects) and thereby, address the "telecom divide" (ITU, 1985). Progressively, global institutional efforts elevated Information and Communication Technologies for Development (ICT4D) to the forefront of the international agenda. ICT4D refers to the application of computer mediated technologies toward social, economic, and political development, with a particular emphasis on fighting the digital divide, helping poor and marginalized people and communities.

Unlike "mainstream ICTs", where the main goal is to create software for business purposes, ICT4D is about what should be done to support human and socio-economic development, and how to do it. It is not about the technologies themselves, but is concerned, rather, with how these can be used to empower poor and marginalized communities (Heeks, 2009). This implies that technologies, platforms and tools that are used in ICT4D must fulfil some largely agreed-upon features such as affordability, relevance to development, accessibility, openness, customizability and ownership. A comprehensive description of these specific ICT4D features is included in (Kettani and Moulin, 2014) and in (Avgerou, 2010). An ICT4D Tool/Technology may not fulfil all ICT4D specific features but, necessarily, it must fulfil some of these without compromising the rest.

III. ARTIFICIAL INTELLIGENCE FOR DEVELOPMENT

The field of Artificial Intelligence (AI) has been around for more than 80 years, as a sub-field of Computer Science. AI aims at building 'intelligent agents' and devices to mimic tasks that are naturally associated with humans (McCarthy, Minsky, Rochester & Shannon, 1955) such as understanding, reasoning, searching, seeing, singing, thinking and talking. To perform these tasks, such devices (programs, bots, robots) must have some knowledge about the world in which they evolve and how they can manipulate it to perform useful tasks. Up until recently, these actions/functions were exclusively associated with humans, as a kind of cognitive feature demonstrating the superiority of humans over machines. Hence, these cognitive activities were not parts of common computer functionalities!

In the 1950s Alan Turin, one of the fathers of AI, proposed and designed the famous Turing Test (Turing, 1950). The aim was to provide a tool for assessing if a machine was able to exhibit an 'intelligent behaviour'. The idea was to determine if a machine can mimic human intelligence in an interaction with a human using natural language so that communication could be indistinguishable from interactions between humans. The Turing test does not commit on the nature and structure of the reasoning process performed by the machine.

Many researchers suggested that an AI agent should not only act "humanly", but also, and more importantly, that it should use "human thinking" in the process of producing the intended outcomes/results. But what is "human thinking"? How is it linked to intelligence? Where does it come from? How does it apply in/to the context of automation and agent programming? Is intelligence exclusively related to mathematical and logical deductions and inductions, or is it rather more about heuristics, intuition, learning, understanding, discovering, awareness, etc.? Up until now, there has been no formal/specific agreement among the AI community on these important issues, leading to some "uncertainty" surrounding the nature, scope and role of

AI systems. And, because of such uncertainty, the AI field went through several ups and downs, during the past 70 years or so (Russell & Norvig, 2021). The last AI hype that is still in progress, is with no surprise among these.

Thanks to the considerable performance increases in the CPU and GPU and to the huge data sets made available through business records, individuals' profiles and data obtained from social media, the use of AI has significantly accelerated over the last 10 years, especially in areas such as client support, natural language interactions (and communication in general), vision/image recognition, process optimization, and fraud analysis on transactional data. As their main computing technique most of these applications use either Machine Learning or Deep Learning (or a combination of both). Such techniques (stochastic, linear, or probabilistic) are purely quantitative with no intuition and/or common sense involved in them. The denomination "Weak-AI" has been attributed to the current AI hype to denote its limitation in terms of the AI theoretical foundations and its task-specific orientation (Searle, 1980). Moreover, "Strong-AI" emphasizes the creation of machines with cognitive capacities comparable to human intelligence (Searle, 1980). It involves the effort to replicate human understanding, reasoning, learning, and problem-solving across multiple areas. Strong-AI seeks to create robots with the goal of replicating the whole range of human cognitive capacities.

The United States Agency for International Development (USAID) was amongst the first to advocate for the use of *AI for Development* (USAID 2018). Loosely equating ML with AI, the agency claimed: "ML and AI have a tremendous potential for helping to achieve sustainable development objectives globally. They can improve efficiency by automating labour-intensive tasks, or offer new insights by finding patterns in large, complex datasets".

The International Telecommunication Unit (ITU) defines AI for development (*AI4Dev*) as a challenge that aims to identifying great ideas in Artificial Intelligence and utilizing its impact on Sustainable Development Goals (SDGs), in developing and less developed countries [1]. The ITU developed an action-oriented, global & inclusive UN platform, *AI for Good*, with the goal of identifying practical applications of AI to advance the United-Nations' Sustainable Development Goals (SDGs) (United-Nations 2015) and scale those solutions for global impact on [2].

The United-Nation Development Program (UNDP) considers that AI for development is fundamentally about people. Applications of AI for development need to be led by lives and livelihoods, not just data points and digital [3]. Putting people at the centre of AI thinking, piloting and scaling is a crucial foundation of the AI4D approach at UNDP.

The term AI4D used by these agencies suggests that there is some substance of AI that is properly and exclusively dedicated to Development, or that it is more/better fit for the Development context. Juxtaposing the "D" next to "AI" implies, as well, that there is some complementarity between the two fields, or some affinity that goes without saying, or an obvious added value that is mutually applicable. However, we need to emphasize that, regardless of whether we look at AI from the Strong-AI perspective or from the Weak-AI perspective, the AI concerns and fundamentals, as we briefly introduced them earlier in this paper, have nothing to do with International Development, and International Development has never been an issue in (and for) AI.

If we consider AI technology, from the "Strong" perspective, with the ultimate goal of computerizing human cognitive abilities in order to "manufacture" machines/devices with comprehension, adaptability, and an independent thinking level equivalent to humans, one will find it complicated (otherwise impossible) to relate Strong-AI to ICT4D, or to International Development in general.

If we consider AI technology from the "Weak" perspective which applies to current AI technologies, the unfitness of AI for Development is blatant for many reasons, including:

The lack of generalization, adaptability and comprehension, outside the specific set of tasks/fields where the AI technology is applied, including (but not limited to) chatbots, profiling, imagery, search and assistance. Adopting AI necessarily means using it to solve a problem within the range of this specific set of tasks. At the level of countries, this triggers the risk that decision makers may alter their current digital transformation needs for the country, with unjustified needs related to the specific tasks/fields AI solves;

a) The inability to handle unforeseen conditions/situations leading to endless reprogramming and interventions by AI vendors/consultants. At the level of countries, this means increasing their dependency relative to the AI Industry, and weakening their autonomy;

b) The lack the "explainability" is another main problem of current AI systems because they are not able to justify their recommendations with arguments and explanations that a human legitimately needs to accept and understand and the proposed actions. Indeed, Weak-AI Systems do not have the ability to explain their decisions and the proposed scenarios, and using them at the level of countries, increases the risk of empowering autocratic and authoritarian governance systems and weakening citizens' participation and involvement;

c) It is obvious that the AI technology stack is an expensive one, which is against the affordability and openness features of ICT4D;

d) AI is essentially data driven, which means that the systems are trained and have learnt what they" know" to do thanks to huge amounts of data that have been accumulated in gigantesque data stores, over decades and decades of time, through a considerable effort of digitalization, analysis, structuring, standardization and normalization of real worlds "things" and "situations". Financial data sets include, for instance, how banks have processed loan requests of their clients, over the last 50 years, and what were the corresponding decisions (to grant the loan or not, following the client profile), and how were these decisions fit or unfit with respect to what actually happened with every single client and every single loan request (has the loan be reimbursed, has there been any difficulty, etc.). Justice data sets include how judges and tribunals have processed the cases, what the verdicts were and whether these verdicts were fit or unfit. By analogy, we can use these 2 examples to imagine the type, nature and volume of data that is needed to use AI in highly social sectors such as Education, Health, Culture, etc. give an idea about that the data AI systems use/need. Clearly, in most countries of the world, and in particular in developing countries, the data that AI requires does not exist and would need decades of hardship to be elaborated and readied. The suggestion that AI systems' decisions are data independent is simply a fallacy. The lack of enabling data means simply that AI is not possible in the context of Development;

e) Black-box oriented architecture means that AI systems do not allow to know how they are internally organized, structured and programmed. The current hype is about 'Deep Learning', but that does not mean that programmers know better how the system is adjusting its parameters and internal data (weights of neural nets)! Hence, people should faithfully use AI systems, as they are, but one can never own them, master them, or produce/manufacture them. In the ICT4D Context, where countries are highly encouraged to develop their local capacity, to master technology and to contribute to the society of knowledge, the adoption of AI is simply not fit;

f) AI tools and solutions are mainly cloud-based; which means that most of the hardware, software and data that form the system, and that is needed to run it, are located somewhere in the world, that you don't know of. As data and information are the heart of any governance system, having these located remotely, with the associated risks (corruptibility, loss, disruption, etc.) is simply against the sovereignty of countries and their regalian attributions.

Finally, if we forget about the distinction between Strong-AI and Weak-AI, and we try to use AI just like any other technology tool/application, today's AI appears more as a harming and disturbance element rather than a simple/normal enabling technology for Development! This is, among others, due to a high pressure put by vendors (and some development agencies) on decision and policy makers using magical headline such as: "AI is here to solve all your problems, just but need to buy!". If you transpose this headline to the general audience language/understanding, this will likely read "if you don't use AI, you are not a good decision maker!". At the level of regions and countries, this reads "if you don't use AI, you are not using the right tools to support/enhance your governance process!". This unhealthy pressure has numerous consequences, including:

a. Biasing the choice of the right technology to use;

b. Disturbing and delaying (again) the implementation of national digital transformation strategies;

c. Spending (a lot of) money with no impact on the Development process;

d. Introducing more doubt, perplexity, and fuzziness among decision and policy makers;

e. Widening, again and again, the digital divide.

IV. CONCLUSION

During the past decade, through slogans such as *AI for Good*, *AI for the Poor* and *AI for Development* (AI4D), AI has been strongly promoted to support and accelerate Development. This 'AI frenzy' may potentially overshadow the continuous efforts needed to sustain ICT4D in developing countries, at least in the mind of citizens and of policy and decision makers.

In this paper, we shed some light on an important aspect that seems to be forgotten in the current AI4D promotion: the principle that using any technology in ICT4D should first promote/support Development and contribute to good governance in general. We highlighted the contrast between the nature and purpose of AI, and its purported revolutionary use as an ICT4D technology. Although, at first glance, AI4D seems comparable to ICT4D, we showed that the analogy does not stand.

Artificial Intelligence, as a field of knowledge, is undoubtedly interesting and exciting! It has great potential, but it does not particularly fit in the context of Development and is not inherently *ICT4D Compatible*. ICT4D is different from ICT, and from AI, taken alone. The difference does not only encompass the context, specifications and methodologies that are strongly linked to Development, but they shall fulfil specific requirements derived from the development context including, among others, affordability, openness, relevance, ownership, understandability and explainability. We showed that current AI applications do not comply with these requirements. As an alternative, we *propose a vision that* fosters ICT4D thanks to the wise use of relevant AI applications, in the same way as any other enabling technology. We believe that in the context of development, this vision is a better fit and more reflective of what (and how) to conceptualize the benefits of the AI technology, without compromising the ICT4D fundamentals. We are currently working on a methodological framework to accompany policy and decision makers who would like to adopt such a vision

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