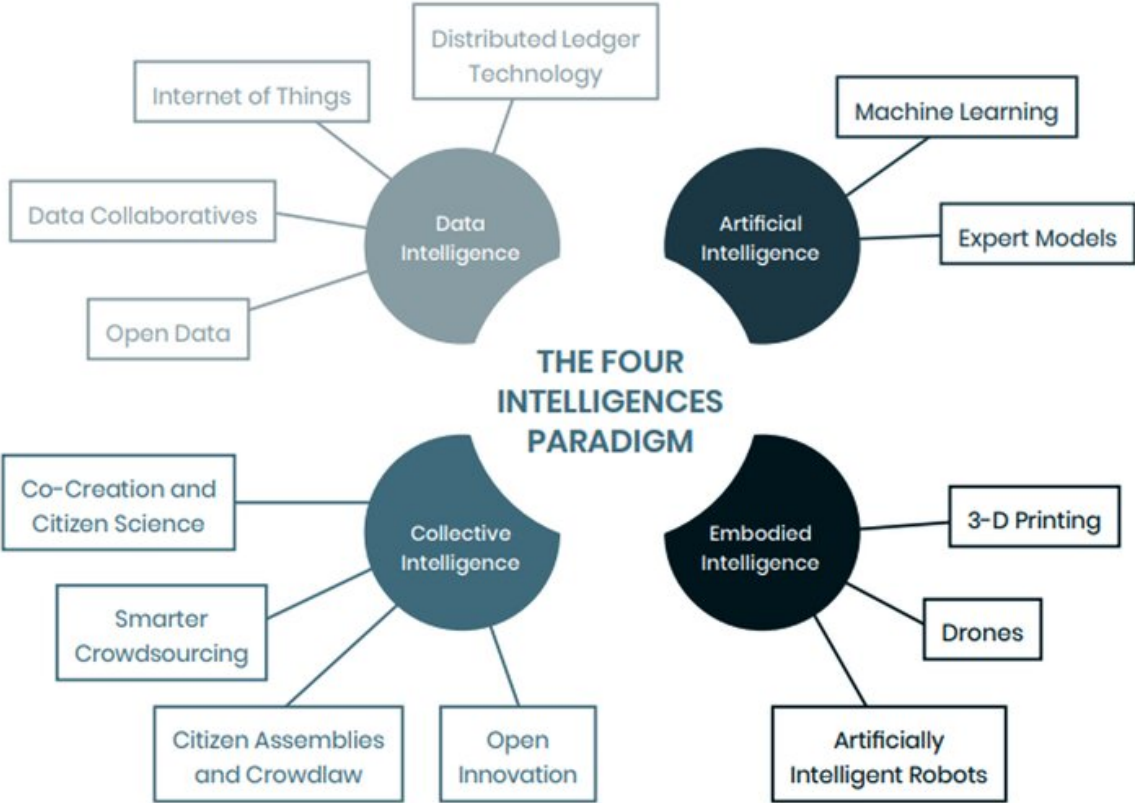


How the emerging use of technology can achieve sustainable development (if done responsibly)

February 11 2021, by Peter Addo and Stefaan G. Verhulst



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Every new year offers an opportunity for reflection. It is a time to set

new goals and revisit old ones. The start of 2021, then, represents a chance to look at successes and failures in meeting the sustainable development goals (SDGs). Since the United Nations General Assembly set these goals six years ago, the SDGs have served as a guide for what the world needs to achieve a ["better and more sustainable future for all"](#).

There has been progress on all 17 goals, which target poverty, health, and inequality around the globe. Nonetheless, the work remains [slow and uneven](#), hampered by low political will, resource constraints and the COVID-19 pandemic. With the agenda's 2030 deadline looming, the moment is right to ask if [new tools](#) and techniques can be used to accelerate progress. New technologies may provide innovative ways to organize human action.

This month, the GovLab and the French Development Agency (AFD) released a report looking at precisely these possibilities. ["Emerging Uses of Technology for Development: A New Intelligence Paradigm"](#) examines how development practitioners are experimenting with emerging forms of technology to advance development goals. It considers when practitioners might turn to these tools and provides some recommendations to guide their application.

Broadly, the report concludes that experiments with new technologies in development have produced value and offer opportunities for progress. These technologies—which include data [intelligence](#), [artificial intelligence](#), [collective intelligence](#), and embodied intelligence tools—are associated with different prospective benefits and risks. It is essential they be informed by design principles and practical considerations.

Four intelligences

The report derives its conclusions from an analysis of dozens of projects around Africa, including Senegal, Tanzania, Uganda. Linking practice

and theory, this approach allows us to construct a [conceptual framework](#) that helps development practitioners allocate resources and make key decisions based on their specific circumstances. We call this framework the "four intelligences" paradigm; it offers a way to make sense of how new and emerging technologies intersect with the development field.

The four intelligences include:

- Data intelligence, which covers all those technologies and methodologies that allow for the analysis or visualization of data to support decision-making. Data intelligence encompasses Internet of Things sensors, open data platforms, and [data collaboratives](#) –structures that allow actors from across sectors to exchange data to create public value. One example we consider is from Senegal, where an international development company formed a data collaborative with the telecom company Orange to estimate the prevalence of illiteracy. The resulting paper [identified](#) hot spots of illiteracy and provided a methodology for future work.
- Artificial intelligence encompasses algorithms intended to mimic human learning and cognition. AI includes both machine learning (algorithms that learn from and improve their behavior through data) and expert models (systems that attempt to mimic the decision-making of a human expert by following predefined rules). While applications of AI remain limited due to resource constraints, they can be useful where data is readily available. For example, in Tanzania, researchers [applied](#) machine-learning methods on accessible satellite data to assess [road conditions](#); the assessments had a 73% accuracy rate, allowing policymakers to potentially identify and prioritize areas in need of road repairs.
- Collective intelligence uses networked tools to solicit input from groups. Collective intelligence can involve citizen science tools that allow individuals to collaborate and develop knowledge as

well as smarter crowdsourcing platforms that allow organizations to engage with experts. It also includes [crowdlaw](#), networked technologies that enable public deliberation and policy co-creation. In Uganda, for instance, citizen assembly tools [have helped](#) citizens pick which infrastructure projects they want funded. The result—in Uganda and elsewhere—is not just a more transparent process but a more legitimate one as well.

- Finally, embodied intelligence deploys data and AI in the physical world to automate energy- and time-intensive processes. This form of intelligence often includes expensive tools like unmanned aerial vehicles and 3-D printing, and there are only a handful of examples in the field. However, in Nairobi, some local companies [have used](#) 3-D printing to rapidly create plastic face shields amid the COVID-19 pandemic. One company produces up to 500 face shields per day to support public health authorities.

Principles to inform use

The framework demonstrates the value emerging technologies can bring to development, while also outlining some cautionary thoughts and steps that may be needed to optimize that value. Like any tool, technologies such as AI and crowdsourcing can be used well or poorly, in ways consistent with development goals and ways that are not. It is that critical practitioners approach these technologies as only some options available among many and ask themselves whether and when high-tech solutions are truly preferable to existing methods.

Answering such questions are not easy, but development practitioners can be guided by a few principles. We discuss six such principles in the report, among which three stand out.

First, to ensure that using technology is truly justified, practitioners must

ensure the technology fits the intended purpose. To do so, practitioners should ensure the specific application or use of technology addresses a clear, well-defined need in a way that resonates with targeted beneficiaries and the local context.

Second, practitioners must balance benefits against risks, remaining aware not only of how a project can succeed but also of the many ways it can go wrong. All technology projects carry a risk of failure or unintended consequences. Sometimes it may be justified to take these risks, but development practitioners must be clear-eyed and transparent about the risks, both for themselves and for the intended beneficiaries of their actions. Where possible, assessments of risk versus reward should include inputs from target groups.

Finally, practitioners need to ensure their applications of technology are feasible within the necessary time frame. Even in developed economies, emerging technologies can take years to launch at a large scale. Developing countries often don't have the luxury of time, especially during moments of humanitarian crisis. In these circumstances, practitioners need tools and responses that are deployable immediately.

While emerging technologies are not appropriate in all situations, they offer new opportunities to advance the SDGs. As we start a [new year](#), we encourage [development](#) practitioners to consider these technologies alongside existing methods and adopt principles to guide their use.

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