

# Using AI to achieve development goals

The developmental challenges faced by India are too big to be solved by the conventional linear approach

**A**rtificial intelligence (AI) is seen as the next disruptive technology. The increase in computation power and development of innovative algorithms have made possible hitherto unthinkable applications such as self-driving cars and humanoid robots—as well as daily life applications such as the predictive prompt of search engines, and purchase recommendations provided by e-commerce sites. Can the sector look beyond business and commercial enterprises to also provide solutions to pressing human and social development challenges?

A recent United Nations (UN) supported summit in Geneva, “AI for Good”, focused on the potential of using AI technologies for achieving the Sustainable Development Goals (SDGs) by 2030. The speakers talked about the potential use of AI in agriculture, nutrition, education, health, poverty alleviation, climate change, disaster management, etc.

Essentially, any sector, which is data-driven (be it conventional, digital or geo-spatial), is open to the use of AI. In some areas, AI applications are relatively well-developed, while in others, they are in initial stages.

## HEALTH AND NUTRITION

The level of malnutrition and stunted growth in pre-school children in India is alarming. This is despite the government spending crores of rupees on various nutrition initiatives in the Anganwadi programme. The Centre for Study of Science, Technology and Policy (CSTEP) is presently working on a project in Karnataka which is attempting to use AI-based systems to improve delivery of child nutrition programmes. While

existing systems capture data about children, the Anganwadi worker gets overwhelmed with the quantum of data produced. AI-based systems can sift through this data and track the progress of an individual child at various Anganwadi centres in terms of their cognitive development and health.

In addition, image-recognition techniques can help in early identification of stunted growth, epidemics and other health issues. This information can then be used by the programme officers to recommend corrective solutions. Integrating information from other sources, the AI systems can assist in the diagnosis of problems being faced—from drought to poor sanitation and inadequate supplies. We are presently developing the essential components of the system, and it should be in place soon.

## AGRICULTURE

In India, agriculture is not considered to be a remunerative profession because of low yields, dependence on rains and high costs of fertilizers and pesticides. Agriculture also leads to inefficient use of water, often depleting the water table. Several start-ups in the US have used AI to

develop “precision farming” practices, which lead to a more efficient use of inputs and higher yields, according to the *Scientific American* (26 June). Sensors gather information about the condition and colour of foliage and soil moisture content. This information is fed to the system, which determines the amount of water, and fertilizer to be provided. It also specifies which part of the plant needs to be provided with these inputs. These systems have reported higher yields and reduction in agricultural inputs. Of course, the use of such technologies in Indian conditions will need to consider much smaller land-holding sizes and the socioeconomic conditions of farmers.

## EDUCATION

About 40% of our population is below the age of 18. Learning outcomes for these young minds are notoriously poor in our current education system. AI-based systems can assist students with their learning experience, especially in changing the form and nature of content to suit the student. “Smart content” is generated with text summaries, supported with related videos and simulations. They can also help connect with students

who are working on similar problems worldwide. The systems can ensure that learning takes place through frequent testing which can be used as feedback to alter the course content and trajectory.

Intelligent tutor systems are an example of the same (see *Carnegielearning.com*). MIT’s Media Labs has also developed “personal robots” which work and interact with humans as peers. Some of them are even capable of identifying and correcting misconceptions of a student as they learn the material.

AI cannot entirely replace the human teacher, but an AI system can play an intermediate role by providing timely feedback to students and teachers.

Many of these interventions appear to be far-fetched today. But we said the same about language processing, self-driving cars and Google directions. AI is no magic bullet. It is a set of computational tools that can be used to improve decision-making. Some of the available AI technologies are expensive today. There are also ethical issues of privacy of data, equity and liability of actions.

However, there is no denying that AI is in the middle of exponential growth and it has the potential to make game-changing transformations. The developmental challenges faced by India are also too big to be solved by the conventional linear approach. AI provides an opportunity for transformative solutions and India’s scale provides the possibility of rapid cost reduction of these technologies.

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