RSIS S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES
Nanyang Technological University

RSIS COMMENTARY

www.rsis.edu.sg No. 313 – 27 December 2016

Artificial Intelligence-enabled Technologies: Policy Implications

By Tan Teck Boon

Synopsis

Artificial intelligence-enabled technologies like autonomous vehicles and advanced robotics promise to bring about greater automation and efficiency. These emerging technologies will also destroy jobs. A deeper understanding of their implications is needed if we are to be future-ready.

Commentary

AMAZON RECENTLY announced that it would soon be opening a convenience store in Seattle called Amazon Go. This foray into the brick-and-mortar business by the American online retail giant is not the only remarkable thing about Amazon Go. What is more striking is that the store will be replacing cashiers with an artificial intelligence (AI) system that knows which items customers have taken from the shelves and then charges them accordingly.

AI — by definition — refers to machines or computer systems that mimic human cognition and intelligence. Experts believe that AI will someday be capable of self-directed learning and automated decision-making. Like you and me, full-blown AI will also be able to come up with superior ways to complete a task. In fact, it will even get the job done faster, better and smarter than you and I ever could. But unlike humans, it will never complain, get angry or become tired. As AI increasingly displaces humans in many tasks, could it be humanity's final undoing?

An Existential Threat?

Earlier this year, AlphaGo — an AI system developed by Google — defeated a world champion in the ancient Chinese board game of Go. The trouncing of South Korea's

Lee Se-dol is a crowning achievement for AI. Billions of dollars have flowed into perfecting the technology since the mid-1950s and now, it has finally beaten a world champion in a board game considered by many to be the world's most complex.

Yet, despite its impressive computing prowess, AlphaGo still does not have the slightest clue that it had beaten a world champion. This is because it lacks a fundamental understanding of what winning is. What this means is that the most sophisticated AI system right now is oblivious of its own existence. And until AI develops self-awareness, it is not going to see the human race as a competitor, let alone a threat to its survival.

At the moment, most AI experts agree that the advent of human-level AI will not happen for many decades – and that is assuming that the feat is even possible. Crucially, we do not even know exactly how the human brain works, not to mention building a computational system capable of replicating it. So at least for now, we can be more or less certain that AI is not going to supersede us and turn into an existential threat to humanity.

The Real Danger: Technological Unemployment & An Uncertain Future

While AI may not be a threat to human existence, it will certainly usher in other fresh challenges. The most worrisome and pressing one right now is surely technological unemployment — a term that refers to jobs destroyed by new technology.

Although we are still far away from an AI system capable of human-like cognition and intelligence, rudimentary AI technology can already be found in, among other things, advanced robotics, autonomous vehicles and everyday objects labelled under the Internet of Things (IoT). The automation and efficiency that these emerging technologies bring will almost certainly destroy many jobs.

Already, the World Economic Forum has estimated that as many as five million jobs around the world will be made redundant by AI-enabled technologies in the next five years. Soon, researchers, lawyers and even doctors could be joining bus drivers, waiters, cleaners and cashiers at the unemployment lines.

Ironically, Singapore might benefit from the introduction of AI-enabled technologies. Since the country suffers from persistent labour shortages, AI-enabled technologies will help fill those jobs that are either hard-to-fill or in high demand. These emerging technologies are also expected to support an economy that is highly automated and energy efficient. As Singapore undergoes rapid demographic ageing, AI-enabled technologies like carebots can also be deployed in the area of elderly care. In short, Singapore could stand to gain from these technologies.

The story however, will be quite different for neighbouring countries with a large labour force. As AI-enabled technologies proliferate, these countries will have to deal with waves of workers that can no longer find employment. Many manufacturing jobs will disappear dashing hopes of a rising middle-class in these countries. Political upheaval could follow. And it is not hard to envision economic and political instability deteriorating into security problems.

Even though Singapore is expected to benefit from AI-enabled technologies, how it will be affected by an increasingly unstable region is less clear. Moreover, it is also unclear at the moment what repercussions these emerging technologies will have on the society once they are deployed.

Need to Think Ahead

In spite of its far-reaching implications, AI remains a deeply arcane field. Rarely in history has a technology so powerful and important been understood or for that matter, controlled by so few. That ought to be a major cause for concern.

For the foreseeable future, AI is unlikely to exterminate humanity. But AI-enabled technologies will destroy jobs and even though Singapore is expected to benefit from these emerging technologies, unintended consequences – not all of them good – will surely follow. Getting a handle on what these negative impacts might be would be the first step to being future-ready.

This is easier said than done. Pre-occupied with short and intermediate-term concerns, most governments do not have the bandwidth to study the sweeping implications of AI in great detail. That is unfortunate since a finer appreciation of the technology is at least needed to reduce the risk of being blindsided by it.

So going forward, we need to have a better understanding of what the negative repercussions of AI might be. This would require among other things, thinking ahead what those adverse ramifications might be as well as the kind of policy interventions needed to address them. Only then can we be better prepared for the day when the technology becomes an indispensable part of our lives. That would be the first step toward a future that is not only smart, but also secure.

Tan Teck Boon is a Research Fellow with the National Security Studies Programme in the Office of the Executive Deputy Chairman, S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University, Singapore. An earlier version appeared in TODAY.
