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Predicting the impact of technology is a hazardous undertaking, particularly in the Fourth Industrial Revolution in which the pace of change has the sensation of an acceleration and not just a velocity.

But we should also look beyond the cyber realm, as there are left-field surprises that can disrupt as much as cutting-edge digital technologies that capture the headlines, especially when combined with imagination. In this regard, we can learn from history, both from the more distant past, as well as from the more recent present.

First, let's go back to 18th century South Africa. Shaka Zulu, a king of a minor Zulu tribe, decides to replace the traditional long-throwing *assegai* spear with the *iklwa*, a short stabbing spear with a long, broad, spearhead. He trains his warriors to use the iklwa in hand-to-hand combat. Their opponents just throw spears and avoid close-quarter fighting. Combined with a larger and stronger shield, the iklwa transforms the ritualistic forms of battle practiced by Zulus. As a result of this disruptive technology, Shaka Zulu conquers a territory larger than Europe and unites a constantly warring people.

Second, the terrorist attacks of 11th September 2001 demonstrated how an imaginative use of civilian technology – the jet airliner – was able to disrupt the

global balance in a terrible and fundamental way. It was the opening salvo in a new type of conflict based on asymmetric disruptive innovation.

Third, earlier this year, rebels employed a swarm of crude, home-made drones to attack two Russian bases in Syria. It was a bold demonstration of how non-state actors can pre-empt state actors in the use of advanced concepts emerging from the Fourth Industrial Revolution.

Fourth, the Financial Times just a couple of weeks ago reported how a barrage of kites with burning tails and balloons with fuel-soaked strips of cloth were launched from the Gaza Strip and blown by the wind to land inside Israeli territory, often starting serious fires. Some 7,000 acres of farmland were burnt. The Israeli Army reported that some 25 square kilometres had been affected by these low-tech weapons.

What do these examples tell us? While the Fourth Industrial Revolution may have ushered in a new reality of cyberwar that is waged across borders, and often by non-state actors, even low technology can be used in disruptive ways, especially when the asymmetry in the balance of force drives innovation. Necessity is the mother of invention. Imagination arguably is more important that the technology itself. So, military power may no longer flow from the barrel of a gun, but from the joystick of a home-made drone, the keystroke of a computer to bring down a power grid, as happened in the Ukraine in 2016.

Arguably, the standard bearer of the Fourth Industrial Revolution these days is Artificial Intelligence. But AI has actually been around for a couple of decades. Initially, those who rushed into the field were often disappointed. But things are changing, and fast. Deep Mind's AlphaGo defeated the world Go champion in 2016. Last year, a self-learning AlphaGo Zero beat AlphaGo.

In January 2015, Stephen Hawking, Elon Musk, and many other experts signed an open letter calling for research on the societal impact of AI. The letter expressed concern that AI could pose an existential risk to humanity. In the fevered imagination of some, AI could usher in an era of killer robots and Skynet, the self-aware neural network of the Terminator movie series, bent on exterminating human beings.

Here I am reminded of Amara's Law, an empirical law which says that we tend to overestimate the impact of a new technology in the short run, but we underestimate it in the long run. So along comes an invention or a discovery and soon we get wildly excited about the possibilities – and the dangers. Then several years go by and nothing much seems to happen. At that point, sceptics will say the whole thing was just hype. But this turns out to be just the inflexion point when the technology becomes ubiquitous and disruptive.

In the Fourth Industrial Revolution where technological change takes place at the pace of Moore's Law, the only sensible approach is to be wary of the initial hype but wary too of the later scepticism.

Many of us come from large organisations that are burdened by the weight of bureaucratic inertia. The organisation must change to adapt, but when it does, it is not fast enough, perhaps because of lack of the imagination that drives real innovation. Then we will be overtaken by the disruptive changes in our security environment, which is a defining characteristic of the Fourth Industrial Revolution.

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