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The Fourth Industrial Revolution: Coping With Disruptive Change

By Tan Teck Boon

Synopsis

The fourth industrial revolution will benefit mankind tremendously. We can also expect disruptions. Upholding state centrality will ensure continuity and stability amidst this seismic shift.

Commentary

THE FIRST, second and third industrial revolutions gave mankind steam power, electricity and electronics respectively. We are now entering the era of the fourth industrial revolution – a seismic shift that will give us a set of radically new technologies. When these technologies materialise – namely artificial intelligence (AI), the Internet-of-Things (IoT), 3D printing, bio printing, gene editing, autonomous vehicles (AVs) and so on – the world as we know it today will be dramatically transformed.

We can look forward to enhanced longevity. Given persistent shortage in human organs for transplant, bio-printing – a process which draws on 3D printers to create human organs – will let hospitals ‘print out’ human organs on-demand. Cutting down on their development cost, new drugs can be experimented on 3D-printed human organs to quickly establish their efficacy and safety. Gene editing can mean that babies in future will be born free of many genetic disorders.

The Fourth Industrial Revolution and its Discontents

Despite recent reports of crashes, AVs will enhance road safety for users. With just 14 minor accidents after more than two million kilometres on the road, Google’s self-driving cars are proving that AVs can be as safe as – if not safer than – vehicles

operated by humans. Meanwhile, IoT will automate much of our daily lives; for example, our refrigerators will text us when we are running low on food and our air-conditioners will turn off automatically when we step out the door. Our lives will be dramatically transformed in the coming decades.

Nevertheless, like every major technological advancement in human history, we can expect the technologies associated with the fourth industrial revolution to engender fresh problems even as they promise myriad benefits. As we enter the fourth industrial revolution, the question of how this seismic shift will impact our lives becomes more pressing.

Going forward, we can expect quite a few disruptions.

AVs and AI-enabled robotics are likely to eliminate a significant number of jobs in the transportation and service sector respectively. The convenience associated with 3D printing could lead to many retailers, manufacturers and even global supply chains faltering. In the last three industrial revolutions, machines substituted manual labour but living standards improved over time because more value-added work was created. What might presumably be different this time with the fourth industrial revolution is that subsequent job growth could be minimal because many of the new jobs created might well be filled by AI-enabled robotics.

Political instability could surface if technological unemployment – that is, joblessness resulting from the introduction of new technologies – becomes persistent and entrenched. When large segments of the population lose their livelihood, it is fair to assume that they will be frustrated and angry. Consequently, they might gravitate toward fanciful ideas of fringe politicians instead of putting their fate in the hands of sensible figures.

The Rise of Extremist Politicians

In extreme cases, some may even succumb to alternative narratives that are not only fundamentally unsound but violent in nature. Today, the widespread appeal of extremist politicians like Donald Trump and Uwe Junge are apt examples of how political instability and rising unemployment are intricately-linked.

In the fourth industrial revolution, only a select few with the right combination of talent and luck will be successful; so it is only fair to assume that income inequality could widen further. Some disparity is to be expected in life except that high rates of inequality could destabilise societies and weaken social cohesion. And what if the super-rich turn to gene-editing to give their offspring superior traits – further consolidating their wealth and power? Conventions now preclude the use of gene-editing to establish a pregnancy but there is no guarantee that all countries will continue to play by the rules as global competition heats up.

As the technologies associated with the fourth industrial revolution come online, the danger is that hackers could exploit digital weaknesses in them to cause chaos. In theory, no digitally-based system is safe from determined and well-funded hackers. So far, US researchers have demonstrated that they can breach a Jeep Cherokee's on-board computer system, take control of the vehicle and crash it at will. Cyber

criminals could also insert hidden flaws and defects into 3D printed products. Now that 3D-printed parts are being used in jet engines, this form of cyber-sabotage is particularly invidious.

Upholding State Centrality is Pivotal

In the fourth industrial revolution, the role of the state actually becomes more important even as the centre of gravity shifts to major technological companies and businesses. In a world dependent on technology, those who control it will wield tremendous power. Hence, it is foreseeable that in the era of the fourth industrial revolution, the state's influence will progressively be eclipsed by those companies that control the technologies associated with this seismic shift. And that can create a serious problem.

Businesses are driven by profits so when technological unemployment hits, only the state will step in to stimulate demand and create jobs. Even if the state is unable to do so, it can at least help the poor and weak. While private companies do often help the needy, only the state retains the kind of policy tools and planning capabilities to prevent the emergence of a persistent underclass.

The state will also be needed to provide security. Whether it is fending off terrorists or hackers, the state's role in keeping us safe will actually become more important. Again, while private enterprises do perform a number of ancillary security functions, public safety and national defence still rest principally with the state.

The fourth industrial revolution will unleash disruptive forces and because we have become so dependent on technology, unplugging is no longer an option. The real test then is how we can ensure continuity and stability in the face of this seismic shift. Businesses have no real incentives to deal with the disruptions nor in some sense, can they be fully trusted to do so. Hence, state centrality is not only an idea as we enter the fourth industrial revolution but the key to being future-ready.

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