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Robotics and AI to be the face of New Health

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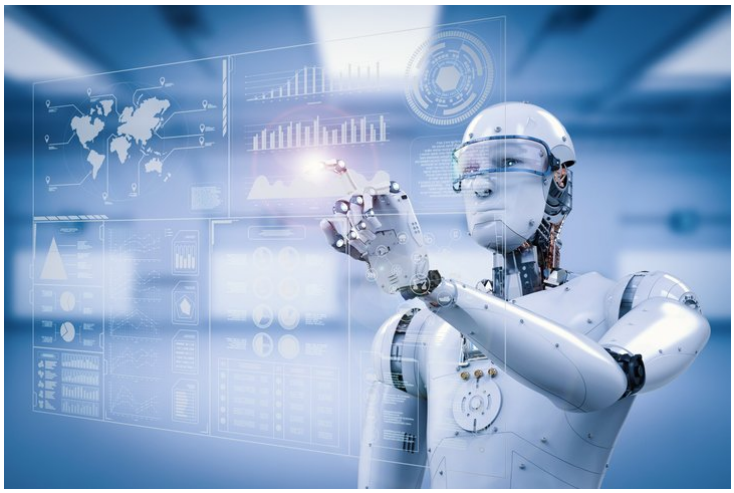
Information technology development in healthcare has been rapidly moving from products to services to solutions (Frost & Sullivan, 2016). The present decade is one of medical platforms focused on real-time, outcome-based care. The next decade is moving towards medical solutions Ã¢â?¬â?? using AI, robotics, and virtual and augmented reality Ã¢â?¬â?? to deliver intelligent solutions for both evidence- and outcome-based health and focusing on collaborative, preventative care. This drastic confluence is leading to AI and robotics defining the face of new health.



The ever-growing healthcare industry is going through a human resources crunch and this has led everyone to look to robotics and automation as a potential solution. This situation also leads to a bigger question- how much can be automated? Artificial intelligence (AI) and robotics have increasingly become a part of our eco-system and are being adopted in equal measure in the healthcare space. However, the idea of a doctorless hospital still comes with a lot of uncertainty and concern. Are we ready yet to let a medical robot with AI probe us, make a diagnosis and prescribe a treatment plan suitable for our condition? Ethical and sustainable growth of technology adoption is also in question. It is only fair to assume that if these robots take the role of our primary surgeons, human clinicians will be jobless.

According to a survey by Markets and Markets in May 2017, the market for AI in healthcare is expected to grow from USD 667.1 million in 2016 to USD 7,988.8 million by 2022, growing at a CAGR of 52.68% during the forecast period. Mr Swaminathan Vangal-Ramamurthy, General Manager of the Robotics Business Division at Omron Asia Pacific says,**"**AI and robotics are already viewed as important components in driving advanced healthcare. At the heart of this transformation is the ability of AI and robotics to ease the manpower crunch, especially in taking on the more mundane, repetitive or simple tasks." In a number of hospitals in Asia, robots are already being used for logistical purposes. Equipped with navigation capabilities, these robots can transport documents, medicines and linen to different parts of the hospital. Hospital staff can then focus on more important tasks such as patient care. Mr Swaminathan mentions that AI and robotics have also entered into drug discovery. "Earlier this year, the University of Cambridge reported that a robot scientist named Eve played an instrumental role in discovering a possible antimalarial drug. This, along with her ability to carry out thousands of tests, led to her discovery of Tricolan, a common ingredient in toothpaste that could possibly limit the spread of malaria."

AI and Robotics in diagnostics and treatment

AI is already being used to detect many deadly diseases, such as cancer, more accurately and in their earlier and more treatable stages. An excellent example is the stats presented by the American Cancer Society, according to which 12.1 million mammograms are performed annually in the US, but a greater proportion of these mammograms yield false results, resulting in 1 in 2 healthy women being told they have cancer. Review and translation of such mammograms is 30 times faster and with 99% accuracy with the use of AI, thus reducing the need for unnecessary biopsies as well as reducing the uncertainty and stress of a misdiagnosis.

On the horizon, Microsoft is developing computers programmed for use at a molecular level to start fighting cancerous cells as soon as they are detected. They are also doing research for using AI to interpret online search engine behaviour, for example, at the point where someone might research symptoms online long before they approach their physician.

Healthcare providers have adopted robotics technology since a while back. According to Frost & Sullivan, the global personal robot market, including ‘care-bots’, could reach US$17.4bn by 2020, driven by rapidly ageing populations, a looming shortfall of care workers, and the need to enhance performance and assist rehabilitation of the elderly and physically handicapped. Japan is leading the way with one-third of the government budget on robots devoted to the elderly. The Japanese ‘care-bot’ market alone is estimated to grow from US$155m in 2015 to US$3.728 billion by 2035 (source: Ministry of Economy, Trade & Industry). Robots are also making a decent place in elderly care. In Singapore, where the Health Ministry estimates that it needs to fill 9,000 medical support positions by 2020 to meet rising demands of an aging population, robots are also being tested in hospitals, especially for porter services – delivering items from point to point. Nursing homes in China have started using robots to provide care for the elderly. One such great example is RoBear. This is a nursing-care robot that is able to lift and move patients in and out of bed into a wheelchair, help those who need assistance to stand, and even turn patients in bed to prevent bedsores. Mr Swaminathan emphasises the need of robots to lessen the strain on already-stretched healthcare systems. “In Australia, there is an increasing number of aged care facilities that have started using robots to perform duties such as transporting linen, medical supplies and meals. This efficient delegation of tasks enables staff to focus more on providing quality care to patients”, he says.