

Editorial

Artificial Intelligence (AI) — a transformational force in Healthcare

We have been so vividly watching a boom in Sci Fi movies and Robotic heroes stealing the limelight pointing out to the serious possibility of building an electronic brain. A lot of interest and investment in AI is being generated, and rightfully so as it has made major changes in a lot of industries. The fact is that AI is an area of computer science that involves in creation of intelligent machines via using algorithms and software that function exactly like humans. The term “Artificial Intelligence” was coined in 1955 in a proposal for a ‘2-month, 10-man study of artificial intelligence’ submitted by John McCarthy (Dartmouth College), Marvin Minsky (Harvard University), Nathaniel Rochester (IBM), and Claude Shannon (Bell Telephone Laboratories)¹. Since centuries, healthcare industry is based on human intelligence, experience and interpretation. Improvisation in healthcare sector is promising better medical facilities and research, providing intelligent behavior indistinguishable from that of human beings. It is since a few decades that humans have developed a capacity for contextual intuition — this is enabling medical experts to make timely and sensible decisions in still a data scarce healthcare environment. Even the most significant AI systems we have at present need to be fine tuned and worked upon to mimic this ability. Sixty years have passed by and AI has seen many winters and summers and since the beginning of this decade there is another variant of AI, known as Deep Learning — wherein software learns to recognize patterns in multiple layers, simulating layers of neurons like an artificial neural network. Deep Learning has been successful in speech recognition, visual object recognition, image classification and recent advances in drug discovery, genomics and self driven cars.²

The various components of AI like machine learning, deep learning, neural networks, natural language processing, and others are likely to bring a complete change in the healthcare sector especially in areas like how doctors are to be trained, make decisions about diagnosis and treatment, patient monitoring and care and more so how to deliver care³. Many medical organisations like the National Health Services, The Mayo Clinic, Massachusetts General Hospital and Memorial Sloan Kettering Cancer Centre are developing AI algorithms for healthcare delivery. Large technology companies such as IBM, Samsung, Google, Appier, Voyager labs are leading in AI revolution. Some of the start-up companies in India leading the race for AI are Alndra Systems, Sig Tuple, Artivatic Data Labs, Tricog health Services Pvt Ltd. Some of them provide individuals personalized interest in Health Lifestyle Fitness psychological response in real time. Some provide intelligence screening solutions to analyze visual medical data another helps to reduce mortality caused by heart attacks.

Many large technology companies are contributing to AI algorithms for use in healthcare:

Samsung has partnered with Babylon Health to offer AI – powered Medical Consultations to its Smartphone users via the ‘GP at hand services’. Babylon Health, a Smartphone app powered by AI, is making online diagnosis and has cut waiting time from two week to two hours – with the added convenience of remote consultations⁴. National Health Scheme in UK is working with Google’s DeepMind Health to provide new technology to clinicians with quick accurate analyses and get faster specialist care treatment to patients.⁵

Amazon and its partners JP Morgan Chase and Berkshire Hathaway are working on AI in health to provide simplified, affordable medical services. They are trying to provide medical advice and negotiate for lower drug price. Companies like Ali Baba and Tencent are working in China and testing on online medical advice and drug tracking systems and building diagnostic tools that will make doctors more efficient.⁶

IBM Watson Health is supposed to synthesises enormous amounts of data and suggest novel insights as well help design clinical trials. IBM’s Watson oncology has partnered with Memorial Sloan Kettering Cancer Centre and Cleveland Clinic. Manipal hospital in India and Watson have also collaborated for board recommended treatment for breast cancer cases. IBM Watson health is also providing cognitive solutions for cardiac illness with CVS Health and associated with Johnson and Johnson on analysis of scientific purpose for drug development⁷. But lets also remember that AI is not the ultimate in healthcare. Infact a recent internal document from IBM shows that Watson recommended multiple unsafe and incorrect treatment recommendation, but then this again is a very recent field and needs to constantly upgrade it after several feedbacks.

There is a huge inequality of healthcare distribution in India. The cheapest and fastest way to bridge the urban–rural health divide is through Telemedicine. Telemedicine can bring specialized healthcare to the remotest areas in developing countries like India especially when huge strides are being made here in the field of Information and Communication technologies.⁸ Millions of poor Indian patients at remote places can be provided specialized healthcare with Telemedicine initiative like HealthSAT.⁹ Presently in India AI in healthcare industry is trying to build

human capacity and not replace human work all together. India has large number of patient data and burgeoning start up community. India can use AI to address many healthcare-related problems. Recent reports suggest that AI can probably add USD 957 billion to Indian economy by 2035.¹⁰

The increasing availability of healthcare data and rapid development of big data analytic methods has made possible the recent successful applications of AI in healthcare. With increasing effectiveness and authenticity of AI in healthcare, we need to prepare our professionals to accept, collaborate and partner with AI and advanced robotic systems.³ At the same time, we also must be ready for legal liability, morality and ethical issues, inherent bias and negligence when errors occur. Regardless of all these issues, AI will be a transformational force in healthcare very soon and for the better.

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