Technology and Innovation: The Game Changer of the Next Decade

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Healthcare changes are happening at a startling pace, thanks to newer innovation and technology. It is true that technology has invaded the health care space ever so slowly, probably due to the verity that most doctors are not ready to accept changes. But now, there is no going back. The healthcare industry is currently being transformed totally, as it gears to meet the challenges of the coming decade. There is no doubt that technology will help healthcare institutions to ensure more efficiency in providing their services and deliver better outcomes and patient care. The question that has no ready answers but that which needs to be discussed loudly is—Are we in India ready for the new challenges? If we aren't, we will lose out sooner than later. Some of the important trends that are going to change the entire landscape of healthcare are:

Artificial Intelligence (AI)

David Agus, a professor of medicine, and one of the prominent voices of technology in the field of medicine, has stated that “AI would help make a good doctor great”. Undoubtedly, to stay relevant in the practice of medicine, one has not only to sensibly accept what is coming but must buy fully into it as well. The days are long gone, when many of the traditional doctors resisted transitioning from the age of paper charting to that of electronic medical records (EMR). The new mantra for doctors is to adapt or perish. A team from Johns Hopkins, for example, have demonstrated how AI-enabled algorithms can help develop means of early detection of sepsis. They called it “Targeted Real-time Early Warning Score (TREWS)” [1]. Sepsis has always been a major nightmare for every surgeon. A time has come to create our own data for our learning. There is no doubt that a large

number of digital innovations are revolutionizing healthcare and technology in medicine and are here to stay.

Large Data

Data is everything, chiefly in the healthcare sector, ranging from diagnostic reports to filing histories of patient treatment. Healthcare facilities have an overwhelming amount of information for storage. This is now being used to help physicians make accurate diagnoses and recommend treatments. EMR is no longer enough for cost-effective, high quality care, rather it has started to make big data analytics a great deal more accessible to providers across the care continuum. In turn, large data have nearly produced a seismic change in approach, namely the decision making of providers, interaction with their patients, and in powering their daily workflows [2].

Cognitive Computing

Also known as semantic computing or machine learning, it involves the use of algorithms, which can “train” analytic systems to recognize patterns in large-scale datasets. The systems are taught to make connections in a manner similar to that of the human mind. These scarily smart computing platforms never forget what they have learned, and can process data much faster and more comprehensively than even the best-trained clinician [3]. Concierge, developed by IBM, classifies healthcare experiences with the help of the IBM natural language, along with the analysis and learning ability from the consumers [4]. This helps in making positive decisions in the healthcare domain with the help of customized guidance on behaviors and activities of the users.

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3D Printing

3D printing is another area which will replicate multidimensional models of problematic areas inside patients. Surgeons can handle the models and simulate a variety of possible operation replicas before performing the actual surgery. Alternatively, 3D printing can be used in reproducing bones or other organs in the human body. This advance in technology is also pushing into prosthetics [5, 6].

Mobile Applications

Today, mobile applications are available for everything, and this is especially true for the healthcare sector. Doctors and patients are discovering new ways to use technology to monitor personal health. Nowadays, tracking daily sleep patterns, counting calories, researching treatment options, and even monitoring heart rate is possible this way.

Other innovations like remote monitoring, wearable devices, and robotics are all going to really disrupt the way we deliver healthcare. All these are creating a different challenge to those medical professionals who love to work in silos. A time has come for doctors to be sensitized to the need for the coming together of the medical and engineering community in the innovation process and face the challenges together in the MedTech space.

For anyone who has the inclination to be an innovator, there is a need to focus on covering three aspects of Med-Tech innovation: (a) desirability (identifying unmet clinical needs), (b) feasibility (solving unmet clinical needs), and (c) viability (building business cases for targeted solutions) [7]. The last few years have seen a big rise in what has become known as frugal innovation, whereby the use of resources in the development, production or delivery are minimized or leveraged in new ways, thus producing products and services at dramatically lower costs. The technology trends that are defining the future of healthcare in India are at the threshold of expansion. Using them in the right manner will yield results that can put healthcare on an exemplary pedestal for the rest of the world. To quote a famous surgeon "...healthcare really doesn't need a tool that doesn't exist". Everything that is required for wonderful healthcare delivery is already available. It is just that we haven't put it together.

Finally, innovation in surgical procedures and technologies is important for continued progress in our specialty. There is a need for collaboration between the surgeon, the hospital, the device manufacturers, and the other stake

holders. The surgeons can facilitate the introduction of new technologies to help ensure that the best possible treatment options are reaching the patient. At the same time, it is important to track the clinical outcomes and complications associated with new technologies using registries and other methodologies, to ensure that our patients and society in general realize the benefits of these innovations and avoid undue risks.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical standard statement This article does not contain any studies with human or animal subjects performed by the any of the authors.

Informed consent For this type of study informed consent is not required.

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