

Artificial Intelligence in Health Sector

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Abstracts-

In Today's World Artificial intelligence is growing in every sector of the industry. Artificial Intelligence is the ability to perform cognitive functions such as perceiving, learning, reasoning, and solve problems. At its core, AI is about getting computers to do things that require human intelligence. All over the world, there are more than 20 industrial departments where the use of Artificial Intelligence is used like-banking, consumer products, health care, life sciences, media and entertainment, oil and gas, power and utilities, the public sector, real estate, retail, technology, and travel, hospitality, etc . And it has the great potential to develop the health sector in the developing and developed country by enhancing access to health information and making health services more efficient

Introduction-

Artificial intelligence (AI) and related technologies are increasingly prevalent in business and society and are beginning to be applied to healthcare. AI has the potential to transform many aspects of patient care, as well as administrative processes within the provider, payer, and pharmaceutical organizations. There are already several research studies suggesting that AI can perform as well as or better than humans at key healthcare tasks, such as diagnosing disease, making productive models by analyzing reports, generating SOS Alerts, and many more. However, for a variety of

reasons, we believe that it will be many years before AI replaces humans for broad medical process domains. In this article, we describe both AI offers to automate aspects of care and some of the barriers to the rapid implementation of AI in healthcare.

Artificial Intelligence is based on the principle that human intelligence can be defined in a way that a machine can easily execute the task from the most simple to those that are even more complex

It has great potential to improve the health sector in both developed and developing countries by enhancing access to health information and making health services more efficient; they can also contribute to improving the quality of services and reducing their cost. Patient information systems, for example, can track individual health problems and treatment over time, giving insight into optimal diagnosis and treatment of the individual as well as improving the delivery of services. This is particularly useful for chronic diseases, such as diabetes and cardiovascular diseases, and for maternal and child health services where a record of health and treatment over a while is required. Analysis of data in patient information systems can lead to new insight and understanding of health and disease, both chronic and acute diseases.

Artificial Intelligence fundamentals machine learning programming devices and other analytical techniques can outlook the

general problems of people in health. Using claims and biometric data by surveying the people artificial intelligence will set up the models that predict the risk of developing metabolic syndrome and the probability of developing any of the five conditions associated with the disorder. Instead of Doctor, Artificial Intelligence use uses robotic process automation to accelerate data analysis and many more

According to CB Insights, healthcare is the hottest area of investment within AI. More than 100 companies have raised equity funding. From insights and analytics, imaging and diagnostics, drug discovery to remote patient monitoring, and virtual assistants, AI is poised to impact every aspect of healthcare.

Personalized medicine (precision medicine) is a new healthcare model, in which the treatment and prevention of diseases are based on individuals' conditions, including genetic information, psychosocial characteristics, environment, and lifestyles. All of this information will produce a vast amount of data, which can only be analyzed and integrated by AI technology. For example, DeepVariant, developed by Google, Inc., is a highly accurate genomic analysis system based on deep neural network technology.

Just a year back, AI in India was predicted to grow by 40% in 2021 but with Mr. Disruption (COVID) in place, the growth potential of AI has skyrocketed. In an era when togetherness is a threat, proximity is poisonous and unity is no longer a strength, AI BRIDGES THE GAP and can ensure restoration of rhythms of life, to a great extent.

The Healthcare sector is not an exception in reaping benefits from passionate innovation and effective implementation of AI. The major innovation in strategizing and implementing AI-related products or applications in the Healthcare sector can be divided into the following categories. However one of the major but rarely discussed segments are the application of AI in combination with IoT and ML can revolutionize, one of the major challenges in the Indian Healthcare sector – **RURAL HEALTHCARE AND REMOTE PRIMARY CARE FACILITIES.**

A multilevel medical AI service network Regarding the situation of rural areas, the medical AI system should be specifically designed for rural areas. If we take a deep dive into rural healthcare in India the major concerns are

1. Availability of qualified HCPs, especially in the night
2. Availability/access to quality medicine
3. Care seeking behavior of the rural population and over-dependency on local RMPs (rural medical healthcare providers)
4. Availability of quality diagnostic labs
5. Access to nearby town and secondary care facilities, especially during the night or in the event of emergencies, where immediate medical attention and some basic medicines also can save lives.
6. Awareness level of care seekers, mostly they tend to avoid visiting a qualified HCPs as that might require travel and thereby loss of wages.
7. Delay in treatment

I hereby describe the best modal of Artificial Intelligence to tackle these problems
Basic level—frontline medical AI system:
This system will be used in the most basic

level of rural healthcare settings, such as the village. The poor general economic conditions, inconvenient transportation, lack of or unstable communication and electric power facilities, inadequate training of medical workers, and relatively simple diseases require this system to have the following features:

1. An economical and practical clinical decision support system, which mainly focuses on common diseases
2. Devices and apps for reading vitals can be the game changers in ensuring quick diagnosis, and access to a qualified physician online even during the night, natural calamities and emergency
3. The Facilities of getting an ECG, O2 saturation, Blood Pressure, Blood Sugar and Breathability like core diagnosis can save lives just by reducing time lapse between the onset of symptoms and access to a physician with at least indicative reading with the vital sign. A very common example of this could be using a simple IS 5 DN for a patient with anginal attacks. Online availability of quality HCPs(should not be big constrained and such sensor devices can be made available with AAA network who are from small villages much time a great connect with patient and doctor

Middle levels—regional medical AI support centers: These could be set up in country hospitals and state or provincial hospitals. The main roles of these include training primary health workers; maintaining, repairing, and upgrading the frontline medical AI systems; and collecting and reporting the epidemiological information received from primary EHRs. Additionally,

these hospitals could be equipped with special medical AI systems to treat patients with serious and complicated illnesses.

Top-level—national medical AI development center: Its role is to coordinate the development, promotion, and upgrades of medical AI systems nationwide, and to foster international cooperation. To ensure the success of this multilevel medical AI service network, multiparty cooperation is needed. The governmental agents are responsible for providing funds and management; nonprofit organizations and charities can help raise funds; university and medical research institutes can design appropriate medical AI systems;

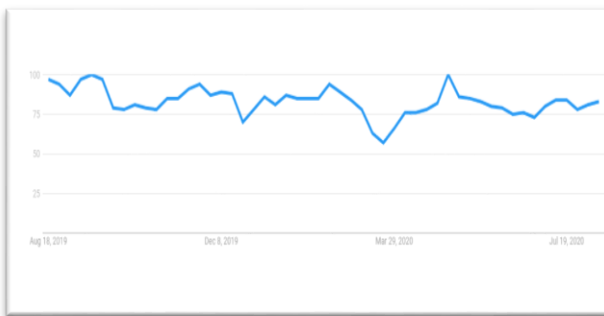
Moreover, AI-based platforms can be used for SMS services to patients and caregivers for specific diseases and therefore can alter care-seeking behavior and pattern. A study was done in 2013 shows around 68% of the rural population only comes out for external healthcare advice and around 83% of them depend on local RMP network, at least for primary care. Certainly, this care-seeking pattern can change with messaging in local languages (many of them even today don't use smartphone, hence I have indicated messaging services) and through making quality care available at the doorstep.

During the second phase of implementation attendance tracking of HCPs, hours spent in facilities, footfall and Rx can all be integrated and we can get real big data worth billion \$, on a wide variety of population while facilitating them with quality diagnosis, prompt treatment, better medicine, and better sensitization.

The Benefits:

The last mile reach. Every Panchayat office, ASHA, ANM, and Anganwari or even selected RMPs can be given sensor for all time diagnosis and remote consultation with qualified HCPs

A real big data on a heterogeneous population to analyze and revolutionize rural healthcare system. The data will include at least, types of diseases, stages at which patient comes for care-seeking, common comorbidity factors, the prevalence of chronic lifestyle diseases viz acute infective disease. Commonly used drugs before coming to healthcare facilities, recommended diagnosis, the outcome of diagnosis, comparative data on diagnosis between app-generated data, and pathological lab data. It also will streamline the immunization process, frequency, and reminders for timebound repeat dosage, especially in mother and child care. This can increase referral by RMP and 3A network to Govt / recognized hospitals and clinics, for critical illnesses and disease requires secondary and tertiary care.



Source:GoogleTrends

The above graph shows that people are increasingly willing to engage with AI and robots if it means better access to healthcare.

The public is ready to embrace this new world of healthcare, but a few things need to happen healthcare institutions have to develop an evidence base, measure the success and the effectiveness of the new technology; implement in phases, prioritize and focus on what consumers want and need. Innovation from AI and robotics lies at the core of our ability to redefine how we deliver healthcare to our citizens. Digitally enabled care is no longer a nice-to-have, but a fundamental imperative for governments and businesses to reinvent how healthcare is accessed and delivered. This is creating unprecedented opportunities to transform what has been the provision of healthcare that is traditionally focused on the clinician, the hospital, their legacy infrastructure, and incentives to maintain the status. AI and robotics are the next waves in this transformation.

The economic and social advantages to be gained from integrating AI and robotics seamlessly into our existing healthcare systems, and then AI creates new models of healthcare based on these technologies, are enormous. Yet healthcare remains personal, and we must not lose sight of the human element.

Conclusion

We believe that AI has an important role to play in the healthcare offerings of the future. In the form of machine learning, it is the primary capability behind the development of precision medicine, widely agreed to be a sorely needed advance in care. Although early efforts at providing diagnosis and treatment recommendations have proven challenging, we expect that AI will ultimately master that domain as well.

Over the past few years, the rapid progress of technology has started to fulfill this promise and it's just the beginning. As these technologies develop, faster and better diagnoses, and more effective treatments, will save more lives and cure more diseases, and we will have more opportunities to be enabled by this technology to live healthier lives.

Whether we like it or not, AI and robotics are the future of healthcare.

Reference –

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