

Role of Artificial Intelligence in Growth of Healthcare Industry in India

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Abstract:

Artificial Intelligence consists a set of computational technologies that is designed to sense, learn, reason and take action. It has the potential to be used in planning and resource allocation in health and social care services. It is bringing a paradigm shift to healthcare, powered by increasing availability of healthcare data and rapid progress of analytics. It has already been integrated in many applications including automating the business processes, gaining insight through data analysis, and engaging with customers and employees. The healthcare industry is often at the forefront of innovation and technological advances due to the wealth of medical devices, equipment and processes that permeate the industry.

Artificial Intelligence in particular seems poised to transform the way we collect, understand and use data on patient health, healthcare services and historical health data to revolutionize medical diagnostics, treatment and research.. In this research paper, It has been highlighted the recent trends and applications of AI in healthcare i.e. Medical records, designing treatment plans, and robotics mediated surgeries, medical management and supporting hospital operations etc. There are many AI platform have been designed which has also been proved to be instrumental in the development of innovative drugs. There is no doubt that AI will enhance the cooperation between humans and machines in years to come and will play an integral role in the improvement of the health index and quality of life.

Key words : Artificial Intelligence, Medical Record , Healthcare Industry , Quality of Life

Introduction:

Advances in AI have accelerated the innovation landscape in healthcare, resulting in improved health outcomes whilst reducing the cost of providing healthcare. AI is now enabling new possibilities in healthcare which were assessed as not feasible earlier. For example, due to the digitization of health records in most of the advanced economies using Electronic Health Record (EHR) applications, mining of unstructured medical data is possible now and using this, various evidence-based decisions can be readily taken by physicians. Big tech companies like IBM and Google are leveraging a huge quantum of data to continuously train their programmes or platforms for advanced healthcare applications like treatment protocol support, drug discovery, diagnosis of diseases and others. IBM's Watson and Google's Deep Mind are solving real-world problems in medicine, free from cognitive biases, by partnering with various healthcare players. Digital transformation, like in other sectors, is believed to transform the provision of healthcare, by enabling the provision of accessible, affordable and quality healthcare to people. Many countries, enabled by AI technologies, are showing progress in transforming the legacy models from being physician centric to become more patient centric. This report focuses on the evolution of AI in healthcare, key AI technologies, the impact of AI on jobs and business models, the future scope of AI, and trends in adoption of AI within healthcare. The report also touches on how AI is helping key stakeholders like hospitals, diagnostic labs and pharmaceutical companies in various ways, along with covering the key AI healthcare vendors including large technology companies and emerging start-ups alike.

Artificial intelligence. and Healthcare Segments in India The healthcare industry in India is made up of a number of segments. Through a review of companies developing AI solutions for health, health practitioners using AI, and researchers looking into the potential of AI and health, it was found that AI is employed in a variety of ways across the different segments including:

1. **Hospitals:** These include government hospitals, including healthcare centres, district hospitals and general hospitals; and private hospitals, which include nursing homes and mid-tier and top-tier private hospitals. From a review of solutions adopted it appears that hospitals in India are employing descriptive and predictive AI.
2. **Pharmaceuticals:** These include manufacturing, extraction, processing, purification and packaging of chemical materials for use as medications for humans or animals. From a review of solutions adopted it appears that pharmaceuticals in India are employing d
3. **Diagnostics:** These comprise businesses and laboratories that offer analytical or diagnostic services. In addition to bigger companies such as Google and IBM, India is also host to start-up companies that specialise in harnessing AI to diagnose disease.
4. **Medical Equipment and Supplies:** This includes establishment's primarily manufacturing medical equipment and supplies, e.g. surgical, dental, orthopedic, ophthalmologic, laboratory instruments, etc. From a review of solutions adopted it appears that companies developing medical equipment and supplies in India are employing descriptive and predictive AI.

5. **Medical Insurance:** This includes health insurance and medical reimbursement facilities, covering an individual's hospitalization expenses incurred due to sickness. From a review of solutions adopted it appears that companies offering medical insurance in India are employing descriptive and predictive AI. Machine learning is able to automate claims management by analyzing vast amounts of data in less time, which reduces processing time and handling costs and improves customer experience. Identifying suspicious patterns in data can also help identify fraudulent claims, which could speed up settlement of genuine claims

6. **Telemedicine:** Telemedicine utilizes electronic communications and software to remotely provide clinical services to patients. It is frequently used for follow-up visits, management of chronic conditions, medication management, specialist consultation and other clinical services that can be provided remotely via secure video and audio connections. This bypasses barriers of time and space and serves to provide isolated communities with speedy delivery of medical expertise. From a review of solutions adopted it appears that companies developing telemedicine platforms in India are employing descriptive and predictive AI.

Literature Review:

History of Artificial Intelligence:

There is no clear interpretation of the concept as “artificial intelligence” (AI) since different languages and cultures have their own semantic nuances. According to the most popular variant, this is the technology of creating machines that can perform intellectual tasks.

The history of AI dates back to 1950, when the computer expert Alan Turing published the article “Computing Machinery and Intelligence” in Mind magazine. In the article, Turing predicted that by the year 2000 machine thinking will appear.

The author himself is more known in connection with the so-called Turing test, the standard interpretation of which reads as follows: “A person interacts with one computer and one person. Based on the answers to the questions, he must determine who he is talking to: a person or a computer program. The undertaking of any program to deceive a man, compelling him to settle on the wrong decision.” as such, if a program can deceive a man, then it can be considered AI.

One of the AI pioneers, Herbert Simon, in 1965 wrote that in 20 years the machines would learn to do any kind of human work.

However, in the mid-1970s, research on AI was virtually halted. The period of regression has come, financing has decreased, in the scientific environment the theme of AI has ceased to be fashionable.

In the mid-1980s, interest in AI greatly increased. This was due to increased funding from the Pentagon. Also, Japan began to create a supercomputer.

In 1997, AI came to a new level when the supercomputer Deep Blue won chess with current world champion Garry Kasparov. The latter recalled that he really felt the presence of an alien intelligence on the other side of the chessboard.

At the moment, many countries, including Russia, are conducting research on the creation of AI. In this race, transnational corporations take part.

According to many experts, AI with a 50% probability will be created by 2050, with a probability of 90% – by 2090. At the moment, its level corresponds to the intellect of the beetle. After a while, the intellect will be created close to the mouse. And then scientists will get to the level of man.

Naturally, having created an intellect equal to a person, progress will not stop there. Somewhere after 30-50 years after the creation of the AI, a supermind will be opened, which by characteristics will exceed a person hundreds and thousands of times.

Government Initiatives

National eHealth Authority (NeHA) NeHA was proposed by the Ministry of Health and Family Welfare in 2015 as an authority to be responsible for the development of an integrated health information system in India. It will be the nodal authority that will develop an integrated health information system along with the application of telemedicine and mobile health by collaborating with various stakeholders

The Ministry of Health and Family Welfare according to news items has reportedly worked with National Law School of India University, Bangalore to prepare a draft legislation on a Health Data Privacy and Security Act Electronic which substantively deals with issues of confidentiality, privacy, and ownership of health data as well as the establishment of NeHA.

Medical and technological advancements occurring over this half-century period that have enabled the growth healthcare-related applications of AI include:

- a) Improvements in computing power resulting in faster data collection and data processing
- b) Increased volume and availability of health-related data from personal and healthcare-related devices
- c) Growth of genomic sequencing databases¹
- d) Widespread implementation of electronic health record systems
- e) Improvements in natural language processing and computer vision, enabling machines to replicate human perceptual processes
- f) Enhanced the precision of robot-assisted surgery

Objectives of the study

1. To determine motivations of applying Artificial intelligence in healthcare
2. To know data types that have be analyzed by Artificial intelligence systems in Healthcare
3. To find out mechanisms that enable Artificial intelligence systems to generate clinical meaningful results
4. To study disease types that the Artificial intelligence communities are currently tackling.

Application of artificial intelligence:

AI is used in various areas where it is necessary to optimize information and its search, improve the quality of products and the production process. In fact, the list can be continued for a long time and it is constantly expanding.

There are several basic areas where it is useful to develop AI:

Creation of systems that imitate the results of human thinking, reasoning, emotions and so on.

Artificial intelligence technologies do not imitate the person himself, but the behavior of biological neural networks and evolutionary processes in nature.

Artificial Intelligence in Medicine:

Unfortunately, modern medicine desires better. It is often difficult for physicians to make an accurate diagnosis, for example, when there is not enough practice or a specific case is far from professional experience. In this situation, artificial intelligence will help, which has the ability to analyze a huge number of disease stories, scan the literature on the topic and take into account much other important information. As a result, a diagnosis will be made and an optimal treatment plan proposed.

The definition of artificial intelligence includes the fact that the machine can take into account the genetic characteristics of the patient, the history of previous diseases and so on. At the current stage of development, AI will not be able to replace the doctor completely, but to become an important assistant to him feasibly, thus increasing the effectiveness of treatment.

In addition to clinical practice, artificial intelligence is used in the implementation of various studies, for example, to check whether medications are compatible with each other or to analyze the genetic code.

PROS AND CONS OF ARTIFICIAL INTELLIGENCE**Pros of Artificial Intelligence:**

The first one is learning. Artificial intelligence is the best suited for various kinds of mechanical activity. The study of outer space, the depths of the ocean or the earth's core is not suitable either for humans or for ordinary machines. Intellect, in turn, can adjust to the situation without the threat of harm to health. Any experiments using artificial intelligence will occur much cheaper and faster than what a human being can do.

The second one is work. Now, no production of the world is fully automatic, because the machine is not capable of evaluating the result of its actions. An artificial mind can not easily manage hundreds of plants around the world, simultaneously without stopping and resting, but also to check the quality assessment. This will make the production cheaper at times. It will also be possible to establish work in harmful and dangerous facilities, where the mortality and traumatic danger are high.

Cons Of Artificial Intelligence:

The first one is failures. Putting a lot of complex tasks on artificial intelligence, we should not forget that any machine can fail. A small error in the calculations can snowball a huge number of consecutive problems. It can also lead to the loss of important data to be processed by the machine. After all, it will monitor most operations and databases.

The second one is the confrontation. Continuous improvement of logical processes can isolate artificial intelligence from humanity. The aggressive impact of even one state in its own interests can cause dangerous and unpredictable consequences. What will happen if the global modern machine starts acting in its own interests? It is only necessary for artificial intelligence to decide that man is a threat or a hindrance, as extinction of people will only be a matter of time. Control of all productions and devices puts a person in the face of a potential threat.

The third one is replacement. As artificial intelligence begins to replace a person in various spheres, more and more people will remain unemployed. Factory production, the basis of employment in a huge number of places, and this is not the limit. The degree of substitution of human labor for robotic intelligence is still difficult to imagine, but the consequences are unlikely to be in favor of ordinary people. And even if everything remains to be won, the blissful idleness of blissful existence can be even greater harm.

The future of artificial intelligence:

It is very likely that areas in which the universal intelligence of the human level is not needed will reach maturity and produce reliable high-quality products in the next decade. Efforts to improve quality and expand boundaries for text and video understanding systems, and to give home robots greater reliability and overall utility, will lead to systems of common sense linking learning and action together in all these modalities.

Special systems for the acquisition and organization of scientific knowledge, as well as for working with complex hypotheses, are likely to greatly affect molecular biology, system biology and medicine. We should start looking for similar influences in the social sciences and policy making.

Especially given the massive growth of machine-readable data on human activities and the need for machines that understand human values if such machines are reliable and useful. Public and private sources of knowledge (systems that know and draw conclusions about the real world, and not just store data) will become part of society.

If earlier AI developers were trying to create a machine that could perform tasks independently, at the moment the situation has changed and the goal that is put before artificial intelligence is to help a person in various matters.

Thanks to the modern approach, artificial intelligence starts to simplify and improve various processes, for example, in Western countries the robot conducts primary medical diagnostics on the basis of dialogue with the patient and his analyzes.

Another promising sphere is the prediction and even some manipulation of human behavior in advertising systems.

Research Methodology

This study tries to get an overview of the artificial intelligence in healthcare sector in India. It explains about challenges of artificial intelligence in healthcare sector. It also explores challenges and competitive advantages and future outlook of healthcare sector in India. This is exploratory work which is based on past literature review, including published research, web sites, newspapers, and the artificial intelligence information that carry AI related information. Secondary data was collected from renowned journals, websites, and articles of artificial intelligence.

This data was compiled by choosing important aspects of role of artificial intelligence in growth of healthcare from gathered information.

Findings

The significant need for technology to bridge resource gaps in India, and the potential of AI to offer affordable solutions at scale means that India may soon be poised to realize the benefits of these technologies on health outcomes.

Key Points

- Innovative, sustainable and scalable artificial intelligence technology has the potential to greatly improve healthcare outcomes in India
- AI applications being developed and deployed in India include algorithms that analyze chest x-rays and other radiology images, read ECGs and spot abnormal patterns, automatically scan pathology slides and assess fundus photographs for signs of retinopathy.

Challenges that need to be addressed

There are some thorny challenges that stand in the way of AI. Here they are:

Considerable risk involved – There is always a benefit of doubt; what if the smart algorithms make a wrong prediction. Will the AI have sufficient safety features so it will not turn back on the humans? Doctors must always be ready for new and exceptional cases that have not yet been recorded by AI. And what happens when there is a security breach? These risks have to be addressed.

Doctor and patient comfort – The idea of machines and apps looking after your health can be a little intimidating to the patient, while the doctors might feel threatened. They might feel dictated by a machine.

Training and expertise to use AI systems – AI can meaningfully improve people’s lives, but the patients should have some level of experience in using the applications. This could be a bit tough in certain cases.

Patient data security – However safe a system might be, hackers might find a way to get around it. So unless security systems are perfected, the patient’s life might be at risk. The hackers could alter or erase the data, wreak havoc or steal private information.

Complying with government healthcare standards – To gain traction in healthcare, AI must comply with government healthcare standards, especially when it comes to patient privacy and safety. This is crucial with information about the patient being readily available in the cloud.

Conclusion

Healthcare delivery has over years become complex and challenging. A large part of the complexity in delivering healthcare is because of the voluminous data that is generated in the process of healthcare, which has to be interpreted in an intelligent fashion. AI systems with their problem solving approach can address this need. Their intelligent architecture, which incorporates learning and reasoning and ability to act autonomously without requiring constant human attention, is alluring

Thus the medical domain has provided a fertile ground for AI researchers to test their techniques and in many instances; AI applications have successfully solved problems with outcomes comparable to that of human clinicians. As healthcare delivery becomes more expensive, stakeholders will increasingly look to solutions that can replace the expensive elements in patient care and AI solutions will be sought after in these situations. However, cold technology cannot totally replace the human elements in patient care and a model that incorporates both technological innovations and human care has to be investigated.

Bibliography

- Glasser j.(2018,January 23) understanding artificial intelligence in healthcare, AHA News tetrieved from <https://www.aha.org/news/insights-and-analysis/2018-01-23-understanding-artificial-intelligence-health-care>.
- Glasser, J. (2018, January 23). Understanding Artificial Intelligence in Health Care| AHA News. Retrieved from <https://www.aha.org/news/insights-and-analysis/2018-01-23-understanding-artificial-intelligence-health-care> Accenture. (n.d.). Artificial Intelligence: Healthcare's New Nervous System.
- Kalis, B., etal.10 Promising AI Applications in Health Care. Retrieved from <https://hbr.org/2018/05/10-promising-ai-applications-in-health-care>
- Preventing Falls in Hospitals.(2013,January31). Retrieved from <https://www.ahrq.gov/professionals/systems/hospital/fallpxtoolkit/index.html>

- Medical News Bulletin (20 January 2017) Artificial intelligence app Ada: your personal health companion; see also: <https://ada.com/>
- IEEE (2018) The IEEE Global Initiative on ethics of autonomous and intelligent systems
- Future Advocacy (2018) Ethical, social, and political challenges of artificial intelligence in health
- Medical News Bulletin (20 January 2017) Artificial intelligence app Ada: your personal health companion; see also: <https://ada.com/>.
- V. Dalmia (2013, February 2013)Telemedicine in India –legal Analysis Retrived January 5,2018,<http://www.mondaq.com/india/x/221258/food+drugs+law/Telemedicine+In+India+Legal+Analysis>