IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 5, Issue 2, January 2025

Impact of Artificial Intelligence (AI) Technology on Healthcare Industry

Ms. Smita Mandwekar[1] and Ms. Harshali Jugseniya[2]
Assistant Professor, Dr. Ambedkar Institute of Management Studies and Research, Nagpur, India[1]
Dr. Ambedkar Institute of Management Studies and Research, Nagpur, India[2]
harshalijugseniya123@gmail.com

Abstract: *In recent years, artificial intelligence (AI) has become increasingly prevalent, particularly in the medical industry. Its impact has grown to such an extent that it is resolved to establish itself as a cornerstone of the medical industry of the future. A thorough search of the PubMed database for literature on AI in healthcare was conducted, and pertinent data was obtained from appropriate sources. Rapid adaption, high diagnostic accuracy, and data management are just a few of the areas in which AI shines and can boost worker productivity. The FDA has consistently authorized additional machine learning (ML) software for use by scientists and medical professionals in light of this potential. There are a few issues, though, such the possibility for healthcare problems, the worry about clinical adoption, and the higher likelihood of data breaches. This article discusses the advantages and disadvantages of using AI in healthcare and offers some possible fixes for any problems that may arise.*

Keywords: Artificial Intelligence, Machine learning, Healthcare, Health services, Drug design, Public health

I. INTRODUCTION

Programming computer systems to analyses, solve problems, and make judgements similarly to human beings is known as artificial intelligence (AI). Although AI had some drawbacks when it was first introduced in the 1950s, making its application in healthcare challenging, it has subsequently evolved into what is currently used in modern medicine. AI started out as a straightforward system series that examined "if this, then this... rules" and was later expanded into algorithms that were customized for each user.

The scientific community has not given much attention to or accepted the early AI in medicine from the 1950s to the 1970s. The capacity to digitize all data into clinical informatics databases and electronic medical record systems was the main focus at this time.In addition, they contribute to the creation of modern search engines such as PubMed.The mid-1970s saw the rise of biomedical search engines, which spread to colleges like Rutgers and Stanford.This resulted in an improved networking infrastructure for research collaboration among multiple universities, which led to the inaugural National Institutes of Health (NIH) workshop, marking the beginning of future collaborative events.

The advent of the consulting software Causal-Associational Network (CASNET) in the late 1970s marked the beginning of many prototypes of how AI in medicine could favorably impact the future.The algorithm may take disease data, apply it to an individual, and then advise the physician on how to help the patient manage the disease.Subsequently, a diagnostic AI for bacterial pathogens and antibiotic treatments evolved from MYCIN to EMYCIN to INTERNIST-1 in a matter of years. This system's development built upon the already vast body of AI medical knowledge to support primary care physicians (PCPs). The AI program that sparked the greatest impact of AI in medicine was DXplain, which was introduced in 1986. PCPs were able to input their patients' symptoms, and the program responded with a diagnosis, a description of the disease, and more references for the doctors.The program began with 500 diseases and has since grown to over 2400. Watson, an open-domain question-answering system, was introduced in the early 2000s.This system gave doctors evidence-based answers to their patients' queries by combining the electronic medical record with additional electronic resources. Later, Watson was extended to investigate additional fields of medical science. As a result, AI is starting to spread into other fields including pharmacy and primary care patient intake.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 5, Issue 2, January 2025

Since AI was initially introduced in the 1950s, programs have been improving. The quality of medicine has improved as a result of their use, with precision, consistency, and efficiency all increasing. Over the past 50 years, AI in medicine has developed into individualized treatment, diagnosis, and prevention. This article explores the potential benefits of artificial intelligence for the future of medicine, along with its downsides.

II. METHODOLOGY

A comprehensive literature searches (Scopus indexed and Web of Science) for AI in healthcare was conducted in the PubMed database, with relevant information extracted from appropriate sources. This review focused solely on English-language literature. The literature on the effects of AI in other areas, such as automotive, robotics, business, and banking, was excluded from our analysis.

Artificial Intelligence in Healthcare Services:

AI is utilized on a daily basis in many aspects of contemporary healthcare, such as research development, drug interaction alerts when doctors prescribe numerous prescriptions, and online appointment booking. Currently, database research and flowcharts are the most well-known and recognized forms of evidence-based medicine. To make the right diagnosis and provide the right course of therapy, a doctor will review the patient's medical history, present symptoms, and lab results. Because it can access several databases simultaneously, an AI system will complete this identical task in a fraction of the time and with more accuracy.This is just a tiny portion of the ways AI has impacted contemporary medicine.

AI has also been adopted by the fields of surgery, gastroenterology, medical imaging, online consultations, and therapy. From its initial application in image capture and storage to its current use in computer-assisted diagnosis (CAD), radiology has made the biggest strides in AI technology. With its ability to quickly identify negative examinations and increase turnaround times for abnormal ones, AI is on its way to helping radiologists reduce their workload. The first deep learning application of AI in healthcare to receive FDA approval was Arterys in 2017. Lesions may be found, reports can be written, and differential diagnoses can be made using deep learning (DL). The original product, which could analyses cardiac magnetic resonance pictures in seconds to determine ejection fraction, has subsequently expanded to include liver, lung, chest, and musculoskeletal imaging, as well as non-contrast CAT scans. DL has been grown to include the capacity to screen for diabetic retinopathy, identify melanoma and nonmelanoma, reduce cardiovascular risk, and forecast Alzheimer's disease development using amyloid data analysis.

AI advancement has also aided in the treatment of CAD in gastroenterology. AI can be used during colonoscopies to help identify and verify benign versus cancerous colon polyps.The same AI approach has been used to discern between pancreatitis and pancreatic cancer, which was previously believed difficult to determine.Conversely, endoscopies have also benefited greatly from AI support. The AI CAD system has been found to be useful for improving imaging, distinguishing between adenomas and polyps, and creating prediction models for patient outcomes and therapy. Since then, AI has evolved from being used for diagnostic treatments to helping with surgical ones. Starting with urology and gyneacology, robotic arms are the way of the future for surgical procedures. With more accurate motions and improved magnification, the robotic arms are designed to resemble the surgeon's hands.AI-powered patient care at PCP offices is quickly evolving into online consultations, advising sessions, prescription refills, test kit orders, and much more.

Depending on how they complete their questionnaire before to the visit, a patient may request a consultation with a certain doctor. The AI will determine what the doctor should order and therapy options based on the basic enquiries about past medical history and current symptoms. The use of AI in PCP visits is gradually spreading to therapy centres as well. Patients can use an online course provided by AI therapy to aid in the treatment of their diagnosis. The use of AI in medicine has advanced significantly.

Artificial Intelligence in Drug Design and Development:

AI can also save time and money in pharmaceutical technology and medication delivery design, according to recent studies. More precisely, the pharmacokinetics and toxicity of possible drug candidates can be predicted by machine learning (ML) algorithms, which forecast drug absorption, distribution, metabolism, and excretion, and deep learning (DL) algorithms, which predict various pharmacokinetic parameters, including drug absorption, bioavailability,

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 5, Issue 2, January 2025

clearance, volume of distribution, and half-life.In addition to saving time, this can significantly lessen the need for and cost of purchasing animals for testing. Big businesses like Pfizer, Bayer, and Roche have said that AI can help them use data to make choices more quickly and enable them to create treatments for cardiovascular and immune-oncology conditions.More specifically, AI may assist in determining which treatments not to pursue, potentially reducing the likelihood of a poor selection and lowering R&D costs. In related circumstances, AI is being used in pharmacometrics to help describe nonlinear interactions using machine learning approaches. Although it is still in the modelling stage, the experimental results show that the trained network "was able to correctly predict the treatment effects across a certain range of dose levels." In other words, the ML system might propose appropriate therapies up to a specific quantity. This demonstrates the promise of AI not only in clinical settings, but also in other areas of medicine.

Way to Make Artificial Intelligence a Pillar of Healthcare:

Several challenges have arisen in AI, making it difficult to establish itself as a vital pillar in the healthcare setting. In the future, challenges like as access to relevant data, clinical implementation concerns, and ethical quandaries will need to be addressed. One recommended solution for resolving data accessibility for AI is to implement it exclusively for participants who are ready to submit their health information with ML systems that may protect data privacy.Furthermore, more stringent data security requirements are required to protect privacy by increasing client-side data encryption and utilising federated learning to train models without data sharing. This will alleviate growing concerns about the ethics of employing AI in the healthcare industry while also providing AI experience in processing healthcare data.There are a number of additional ethical considerations with AI. It will be impossible to hold anyone accountable if a bad decision is made. To achieve better human-centered AI systems, strong laws should be enforced, as well as regular audits and validation.

It is critical that patients be completely informed that AI is processing their information and that they fully consent to the usage of their data for ML. As artificial intelligence improves information processing in healthcare, there may be fewer mistakes than with actual humans. There is also a risk of personal bias towards AI systems, in which humans begin to rely solely on computer work and make no personal decisions. It will be extremely challenging to prevent employees from doing this, and the only way to lessen this is to provide health professionals, medical personnel, and other related staff with the necessary training on how to use AI equipment correctly to guarantee the highest level of accuracy in disease detection and treatment. AI education ought to be created in a manner that healthcare professionals can easily comprehend and that allows for individual choices made by medical professionals. By handling information processing, AI may improve worker productivity and free up healthcare workers to concentrate on the most important aspects of their jobs.

III. CONCLUSION

According to current observations and accessible evidence, AI has an impact on healthcare settings. AI can help physicians make accurate, timely diagnoses and establish effective treatment regimens, shorten patient wait times, reduce superfluous paperwork for nurses, and ensure regulatory compliance. Aside from the benefits of AI in the medical industry, the negative implications must be carefully considered before implementing it in the workplace. The parameters for overcoming the negative elements of AI include resolving data accessibility, keeping data privacy, assuring the validity of ChatGPT, maintaining accountability, and properly training health associates.

REFERENCES

[1]. Amisha, Malik P, Pathania M, Rathaur VK. Overview of artificial intelligence in medicine. J Fam Med Prim Care. 2019;8:2328-2331.

[2]. Hamet P, Tremblay J. Artificial intelligence in medicine. Metabolism. 2017;69S:S36-S40.

[3]. Kaul V, Enslin S, Gross SA. History of artificial intelligence in medicine. GastrointestEndosc. 2020;92:807-812

[4]. Ahuja AS. The impact of artificial intelligence in medicine on the future role of the physician. PeerJ. 2019;7:e7702. doi: 10.7717/peerj.7702

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 5, Issue 2, January 2025

[5]. Paul D, Sanap G, Shenoy S, et al. Artificial intelligence in drug discovery and development. Drug Discov Today. 2021;26:80-93.

[6]. Bhattacharyya M, Miller VM, Bhattacharyya D, Miller LE. High rates of fabricated and inaccurate references in ChatGPT-Generated medical content. Cureus. 2023;15:e39238. doi: 10.7759/cureus.39238

[7]. Panesar SS, Kliot M, Parrish R, et al. Promises and perils of Artificial Intelligence in neurosurgery. Neurosurg. 2020;87:33-44. [

[8]. Islam MR, Urmi TJ, Mosharrafa RA, Rahman MS, Kadir MF. Role of ChatGPT in health science and research: A correspondence addressing potential application. Health Sci Rep. 2023;6(10):e1625. doi:10.1002/hsr2.1625