



Journal Website:
<https://theusajournals.com/index.php/ijmscr>

Copyright: Original
content from this work
may be used under the
terms of the creative
commons attributes
4.0 licence.

THE ROLE OF AI IN HEALTHCARE INDUSTRY

Submission Date: Sep 01, 2024, Accepted Date: Sep 06, 2024,

Published Date: Sep 11, 2024

Crossref doi: <https://doi.org/10.37547/ijmscr/Volume04Issue09-04>

F. E. Kamolova

KIUT-Kimyo International University in Tashkent, Uzbekistan

D. X. Buvayeva

KIUT-Kimyo International University in Tashkent, Uzbekistan

S. M. Matmusayeva

KIUT-Kimyo International University in Tashkent, Uzbekistan

J.A. Djuraev

Associate Professor, Tashkent Medical Academy, Uzbekistan

ABSTRACT

This article analyses the present condition of technological applications based on artificial intelligence (AI) and their influence on the healthcare sector. This work conducted a comprehensive literature research and examined certain real-world instances of AI implementations in the healthcare sector. Undoubtedly, the fast progress of artificial intelligence (AI) and associated technologies will enable healthcare providers to provide fresh value for their patients and enhance the effectiveness of their internal operations. However, successful deployment of AI will always pose distinct problems and the adoption of specific approaches to revolutionize the whole care service and operations in order to fully utilize the advantages of future technology. The analysis is derived on an examination of several academic sources, encompassing research from ScienceDirect, MDPI, Elsevier, and the Journal of Consortium. These sources address studies and data published from recent years till 2024.

KEYWORDS

Artificial Intelligence, Natural Language Processing (NLP), patient management, real-world cases, machine learning, AI-based technology.

INTRODUCTION

Artificial intelligence (AI)-supported technologies have been extensively used in healthcare facilities to enhance the quality of care services and optimize the use of medical resources. Information and communication technology (ICT) is a fundamental component of digitalised organisations that may assist in improving operational efficiency and strengthening competitive edge. The third Concerning the use of artificial intelligence in healthcare, there are two opposing viewpoints. While some perceive it as negative or devoid of value, others consider it to be exceedingly beneficial. Given the inherent characteristics of the services and the susceptibility of a considerable number of end users, there has been a substantial body of study and discourse surrounding the notion of artificial intelligence. At present, artificial intelligence (AI) has shown to be a valuable tool in aiding in decision-making, providing treatment recommendations, demonstrating unwavering dedication, and facilitating authoritative tasks for skilled healthcare professionals. Research suggests that artificial intelligence should be capable of doing some tasks, such as accurately identifying diseases at a level comparable to or superior to human capabilities

[1]. It finds applications in a wide range of diagnostic and therapeutic modalities such as patient monitoring, robot-assisted surgeries, patient data and risk analysis, pharmaceutical discoveries, and clinical trials. Moreover, the integration of AI in the healthcare sector has always been a challenging subject due to humans' apprehension about robots operating on their bodies. [2]

Recent data and research on the implications of artificial intelligence (AI) have demonstrated that deep learning algorithms can accurately identify diabetic retinopathy from eye scans with a 90% success rate (A.K. Triantafyllidis, A. Tsanas 2019). A control center at John Hopkins supported by artificial intelligence enabled staff to allocate emergency department (ED) patients to inpatient beds with a 30% increase in efficiency (Walls, A.E. 2018). This review paper by Rosenberg et. al (2010) provides a comprehensive analysis of artificial intelligence (AI) applications in the healthcare sector. The study indicates that Gunn conducted the initial progressive research in 1976, when he explored the feasibility of detecting severe stomach discomfort using PC analysis (Rosenberg et. al 2010). Organizations such as Google and IBM are

actively engaged in integrating artificial intelligence (AI) into the healthcare sector. The majority of AI-enabled healthcare algorithms utilise Google's Deep Mind Health or Watson's IBM to diagnose certain diseases by analysing data collected from mobile applications (Powles, J., Hodson, H. 2017). [2] An analysis conducted by Aruba, a subsidiary of Hewlett-Packard Enterprise, revealed that over 60% of hospitals globally have integrated Internet of Things (IoT) technology into their facilities. Page 3 Safavi and Kalis project that artificial intelligence (AI) applications have the potential to provide yearly savings of up to \$150 billion for the healthcare sector in the United States by 2026. A total of 40 individuals, including doctors, professionals, researchers, and representatives of regulatory bodies, were interviewed for a study conducted by Lai et al. (2020) in France. The majority of the doctors surveyed held favourable opinions on AI, including its potential and the advantages patients will get in terms of time efficiency and timely notifications. [2]

This article provides a comprehensive analysis of the evolution of artificial intelligence (AI) in the medical sector. It discusses the existing literature on the implications of AI in the healthcare sector, highlights the predominant applications of AI in medical practices, delineates the several benefits that AI offers, and highlights the challenges and limitations that AI is currently encountering in the medical industry.

Furthermore, the research examines several practical instances in the healthcare sector to comprehend the impact of AI on care services and operational procedures.

HISTORICAL CONTEXT AND DEVELOPMENT OF AI

Over time, human perspicacity has generated many folds. Hamet Pierre and Tremblay Jean. It was the 1930s when humanity developed a virtual personal computer that was almost the size of modern rooms. The 1970s marked the start of the use of compact personal computers within the medical services sector. Currently, personal computers (PCs) have a significant role in many aspects of the medical care field, ranging from electronic billing, financial transactions, and doctor billing to providing search and treatment recommendations. Only because to the advancement of Artificial Intelligence has all of this become possible. [1] Artificial intellect (AI) is the replication of human intellect in devices, such as computers or robots, that are designed to imitate cognitive processes that people attribute to other human brains, including learning and problem-solving. Contemporary usage of the terms Artificial Intelligence, machine learning, and deep learning is widespread. Machine learning is a statistical technique where computers are provided with data and then utilize this data to train and learn by fitting a model to it. The most common use of classical machine learning approaches in healthcare is precision medicine, which assesses the most probable success of



treatment alternatives for a patient by considering various patient features and the therapy setting. [2] Machine learning encompasses algorithms designed for several tasks, including regression, grouping, and others. These algorithms must undergo training using data. Supplementing your algorithm with more data enhances its performance. Artificial neural networks are the foundation of the relatively new discipline of deep learning in artificial intelligence. Moreover, deep learning algorithms require data to acquire the ability to address problems. [3] AI technologies encompass machine learning, computer vision, natural language processing (NLP), deep learning, and context aware processing. These technologies may be integrated to offer advanced solutions for many health care challenges. [2] Natural language processing (NLP) is the academic discipline that investigates the interplay between human language and computers. [5] Artificial intelligence advancements are extensively applied in three clinical fields: medicine, neuroscience, and cardiology. The key domains in which artificial intelligence (AI) is applied, and the possible areas of future AI integration, are identification/finding, therapy, and assessment. [1]

KEY APPLICATIONS OF AI IN HEALTHCARE

Application of AI in Diagnosis and Treatment

As artificial intelligence (AI)-supported systems acquire knowledge and make diagnoses based on extensive

medical research and patients' treatment histories, they greatly enhance doctors' decision-making process and therapy. In order to assist healthcare professionals in their diagnostic and decision-making procedures, Google's Deep Mind Health Technology is designed to construct an artificial intelligence model of the human brain that integrates machine learning with a neuroscientific framework. [2] Watson for Oncology, developed by IBM, is the most extensively used artificial intelligence (AI) program in the healthcare sector. Its primary function is to provide clinicians with suitable treatment options. The third Physicians at the Moorfields Eye Hospital in London have created an artificial intelligence (AI) diagnostic system capable of providing therapy recommendations for over 50 eye disorders with a 94% accuracy rate. In China, artificial intelligence (AI) technologies are being employed for the diagnosis of colon polyps. One clinical investigation used the collaboration of AI-based technologies and a gastrointestinal specialist to diagnose a patient. In another clinical research, just a specialist was responsible for diagnosis. When AI was used to assist in the diagnosis, the detection rate of polyps were found to be 20% higher. [5]

Application of AI in Predictive Analytics

Recently, IBM's Watson has garnered favorable media coverage for its capacity to concentrate on precision medicine, particularly in the areas of cancer diagnosis and treatment. A more challenging kind of machine

learning is deep learning, which use neural network models to forecast results by utilizing several layers of input or variables. Advanced deep learning techniques are often employed in the medical sector to identify potentially cancerous growths in radiographic pictures. Radiomics, the field that involves identifying clinically important patterns in MRI images that are not visible to the human eye, is progressively using deep learning techniques. Page 2 In 2016, The Cleveland Clinic, a nonprofit multispecialty academic medical facility in Cleveland, Ohio, started employing Microsoft's AI digital assistant Cortana to use predictive and advanced analytics to identify patients in the intensive care unit who may be at danger. The e-Hospital system of Cleveland Clinic incorporates Cortana to monitor a total of 100 beds across 6 ICUs throughout the hours of 7 p.m. to 7 a.m. The third

Application of AI in Patient Engagement

The potential of artificial intelligence to extensively enhance patient care and reduce medical costs is considerable. The expanding population is expected to drive an increase in the demand for health services. [2] Core application areas of artificial intelligence include providing suggestions for patient evaluation and treatment, tracking patient engagement and adherence, and assisting with administrative duties. In order to ensure precise illness diagnosis and patient safety, active involvement of patients in the medical treatment process is essential. Furthermore, patients

themselves see their own involvement in treatment sessions with medical personnel as a meaningful and beneficial experience for their own benefit. Encouraging patients to actively participate in their medical treatment boosts their level of engagement in fulfilling their role in the process, therefore positively impacting their satisfaction with the quality of care. A study by Boulding et al. found that patients' favorable perception of their involvement in the treatment process has beneficial effects on both the treatment outcome and patients' safety. Hence, in order to enhance the patient experience and achieve higher quality of treatment, healthcare practitioners should prioritize patient involvement and participation as a strategic objective [5].

CONCLUSION

Innovation is essential in the ever-changing digital environment. Given the continuous emergence of new diseases, there is a critical need for a more efficient healthcare system to promote the well-being of individuals. There exists a need for unparalleled technology that may be employed to communicate the requirements to persons. Hence, the use of artificial intelligence (AI) and associated technologies is not optional, but rather a prevailing pattern those enterprises must embrace and exploit to gain a competitive edge. AI applications are revolutionizing care delivery by transforming not just the diagnostic and treatment procedures but also the lifestyle of

patients, since their full well-being necessitates the implementation of comprehensive healthy living routines.

REFERENCES

1. Sai Sruthi Gadde¹, Venkata Dinesh Kalliz // Artificial Intelligence at Healthcare Industry
2. Gadaev, A., Ismoilova, M., & Turakulov, R. (2022). Comparative analysis of calprotectin and helicobacter pylori in the faces and interleukin-6 in the blood of patients with and without COVID-19 before and after the treatment. Scientific Collection «InterConf+», (26 (129)), 236-242.
3. Priyanka Kaushik Chandigarh University, Punjab, INDIA // Artificial Intelligence Accelerated Transformation in The Healthcare Industry
4. DonHee Lee and Seong No Yoon // Application of Artificial Intelligence-Based Technologies in the Healthcare Industry: Opportunities and Challenges
5. Ismoilova, M. I. (2022). Comparative Analysis of Calprotectin and Helicobacter Pylori in the Faces and Interleukin-6 in the Blood of Patients with and without Covid-19 Before and After the Treatment. Central Asian Journal of Medical and Natural Science, 3(5), 218-222
6. A.Narasima Venkatesh // Reimagining the Future of Healthcare Industry through Internet of Medical Things (IoMT), Artificial Intelligence (AI), Machine Learning (ML), Big Data, Mobile Apps and Advanced Sensors
7. Ismoilova, M. I. (2022). Comparative Analysis of Calprotectin and Helicobacter Pylori in the Faces and Interleukin-6 in the Blood of Patients with and without Covid-19 Before and After the Treatment. Central Asian Journal of Medical and Natural Science, 3(5), 218-222.
8. Ahmed Al Kuwaiti, Khalid Nazer, Abdullah Al-Reedy, Shaher Al-Shehri, Afnan Al-Muhanna, Arun Vijay Subbarayalu, Dhoha Al Muhanna and Fahad A. Al-Muhanna // A Review of the Role of Artificial Intelligence in Healthcare