

Elevating Healthcare Services through Integrating Artificial Intelligence Technology

¹Sanjay Sharma, ²Prof. Dr. Shamim Ahmed

¹Research Scholar, ²Research Supervisor

Department of Management, NIILM University, Kaithal, Haryana

ABSTRACT

In an era dominated by digital advancements, Artificial Intelligence (AI) stands out as a transformative force, offering opportunities to enhance operational efficiency and competitive advantage in the healthcare sector. This research explores the integration of AI technology to elevate healthcare services. The study delves into the applications of AI in different prospects of medical sector, including clinical decision, (Electronic Health Record) EHR, personalize medicine, medical robots and diagnosis. This research showcases the potential of AI to streamline processes, improve the quality of care and also revolutionize healthcare systems by providing low-cost interventions for healthy individuals. The paper concludes by highlighting the significant role of AI in reshaping healthcare services, streamlining administrative tasks, reducing the workload for medical personnel and freeing them up to devote greater attention to giving patients care. As the medical profession develops, artificial intelligence (AI) implementation becomes more important in transforming and improving the calibre of medical treatments.

Keywords: *Artificial Intelligence, Medical robots, Diagnosis, healthcare system.*

1.INTRODUCTION

ICT, which stands for information and communication technology, is an essential element of digitally transformed companies, contributing significantly to increased effectiveness in operations and competitive advantages (Aabo, 2016). As we embrace the era known as the “Fourth Industrial Revolution (4IR)”, sophisticated digital tools and gadgets are being widely

used in a variety of sectors to spur innovation and create value (Lee and Lim, 2018). This tendency is also seen in the healthcare industry. In order to improve the quality of treatment and optimize operational procedures, health care organizations worldwide—especially those in constructed economies—are aggressively incorporating modern technologies such as “computational intelligence (AI)”, deep learning, advanced sensors, robotics, analytics for big data, and the “Worldwide Web of Things (IoT)”. A 2017 research by Aruba, to name a Hewitt-Pack Enterprise business, found that more than 60% of hospitals globally had integrated IoT into their constructions. As such, it is very valuable to investigate how these sophisticated digital gadgets affect customer-provider service interactions in the field of healthcare. (Lee, 2019).

The present paper aims the following objective:

1. To explore the integration of AI technology in elevating healthcare service.

2.MATERIAL METHOD

The present paper applied descriptive methodology based on doctrinal sources. The study conducted through secondary sources collected from books, article and published research papers.

3.RESULT AND DISCUSIION

3.1 AI on various Prospects of medical sector

1. AI in Clinical Decision Support

As advancements in medical technology continue at a rapid pace, the generation of new research information has accelerated significantly. The medical literature is now doubling every three years, presenting a challenge for healthcare professionals to stay completely up-to-date, with an estimated requirement of 29 hours per workday for a physician. Given the overwhelming volume of data, relying solely on human capacity becomes impractical. Moreover, the integration of big data, encompassing Electronic Health Records (EHRs), 'omic' data (“such as genomics,

metabolomics, and proteomics), and sociodemographic and lifestyle-related information”, demands comprehensive analysis for meaningful utilization. In response to these challenges, AI technology emerges as a crucial solution. IBM Watson stands as a leading AI healthcare support system, offering assistance to physicians for effective decision-making. Utilizing human language processing with learning algorithms, this system enables healthcare professionals to review patients' EHRs and conduct in-depth searches across relevant regulations and recommendations for medical studies.

In a “double-blind study”, decisions rendered by a tumor board were compared with those generated by the Watson Oncology system. The findings revealed a noteworthy concordance, with the system's recommendations aligning with those of the tumor board in 90% of cases. Notably, the system accomplished this task within a mere 40 seconds, underscoring its efficiency in comparison to the traditional decision-making process(Curioni, 2017).

2. AI in EHRs

AI in Electronic Health Records (EHRs)Initiated in 2009 by the “United States Department of Health and Human Services”, the drive for Electronic Health Records (EHRs) adoption faced notable challenges during its implementation. These challenges encompassed low satisfaction levels with the system, interoperability issues, and a gradual adoption in non-primary medical environments and solo offices. if not those most time-consuming chores in medical centers nowadays is the reporting procedure within EHRs. Deliberato et al. (2017) proposed that AI technology could serve as a valuable asset for healthcare providers, aiding in the collection, storage, reformatting, and tracking of clinical data. Additionally, AI has the potential to facilitate the development of personalized assessments and plans, addressing the evolving needs of healthcare documentation.

3. AI in Diagnosis

4. AI in Assessment Procedures Errors in diagnosis are a serious risk to quality and safety in healthcare. Almost half of clinic diagnostic mistakes in the United States have been known to be harmful, with a total of 5.08% of these errors impacting over twelve million

persons yearly. In response to this problem, artificial intelligence (AI) has become a useful tool for improving the standard of medical diagnosis, especially in disciplines like radiology that handle massive amounts of medical picture data. Harvard University physician and doctor Keith Dreyer claims that "important AI will boost efficiency, accuracy, and outcomes." In order to identify skin cancer, Esteva et al. (2017) used convolutional neural network models (CNN) developed on an ensemble of 129,450 clinical pictures. The results showed that, when it comes about skin cancer classification, an AI system can perform on par with dermatologist.

They hypothesised that using cell phones to increase dermatologists' reach may be an affordable way to improve patient access to diagnostic treatment. A CNN framework created to aid in the pathological detection of breast tumor metastatic in the lymphatic system was described by Liu (2018) of Google, Inc. The results showed that this approach may reduce the false-negative ratio to a fraction of what human examiners encounter while improving diagnostic speed, accuracy, overall constancy. Indeed, a vast range of diagnostic domains have used artificial intelligence (AI) technologies. An method for cardiac movements using MR imaging was recently described by Dawes et al. (2017), allowing precise prognostications among individuals with a history of pulmonary hypertension. According to Moss et al. (2017), AI technology might provide extra data and insights that doctors would have missed by using an automatic rhythm classifying approach to analyse continuous ECGs, also known as electrocardiograms, in dangerously sick patients. Additionally, Lee et al. examined encouraging findings from current research on AI in attack pictures, indicating that artificial intelligence (AI) may be essential to the individualized care of survivors of stroke.

4.AI in Medical robots

Artificial Intelligent technology is used in assistive gadgets like robots in the field of medical robotics. For example, tele-robots may help improve interactions between customers and physicians, while assistive walk gadgets can help in reclining, standing, and manoeuvrings. Furthermore, animals-like robots may interact and amuse patients. Moreover, AI-equipped

robots contribute to surgical procedures, serving as assistant surgeons. A notable example is the da Vinci Surgical System, widely adopted with over 3400 sets in use by 2015.

5.AI in personalized medicine

In the realm of personalized medicine, also known as precision medicine, a novel healthcare model has emerged. This model revolves around tailoring rather sluggish adoption in contexts other than healthcare and solo practice. In medical centres nowadays, one of among the most time-consuming activities is the documenting process inside electronic health records. The wealth of data generated by this approach necessitates analysis and integration, a task for which AI technology is indispensable. Mesko, (2017) asserted that "There is no precision medicine without AI." As an illustration, "DeepVariant, crafted by Google, Inc., stands as a highly precise genomic analysis system leveraging deep neural network technology".

CONCLUSION

In conclusion, the integration of "artificial intelligence (AI)" in the medical sector has shown transformative impacts. From enhancing clinical decision support with systems like IBM Watson to streamlining Electronic Health Records (EHRs) and revolutionizing diagnostic processes, AI is proving its efficiency and accuracy. In medical robots and personalized medicine, AI is contributing to surgical procedures, patient interaction, and the tailored treatment of diseases. As we navigate this intersection, the ongoing advancements and promising outcomes suggest a future where AI continues to play a pivotal role in elevating healthcare services, fostering efficiency, accuracy, and personalized care. However, ethical considerations, data privacy, and the imperative for continuous validation and improvement remain central as we harness the potential benefits of AI in the medical domain.

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