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A Review of Artificial Intelligence in Healthcare

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ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative force in healthcare, offering innovative solutions to improve patient outcomes, streamline operations, and enhance decision-making processes. This review article provides an overview of the current landscape of AI applications in healthcare, focusing on the role of AI in clinical decision support, medical imaging and diagnostics, personalized medicine, and healthcare management. We discuss the types, opportunities and uses, advantages associated with the adoption of AI in healthcare. We discussed how AI used in healthcare with some software.

INTRODUCTION

Health systems worldwide are currently at a critical juncture, grappling with exponential growth in healthcare costs that far exceed the pace of GDP growth. This trend poses significant challenges to the sustainability of health systems globally. Historically, health systems have depended on established illness management pathways and evidence-based care practices to meet healthcare demands. These initiatives seek to standardize procedures, increase quality, and ensure safety of patients.[1] To satisfy healthcare demands and standardize procedures to industry standards, health systems rely on sophisticated disease management pathways and evidence-based treatment solutions. The notion of a "Highly Reliable Organization" (HRO) focuses on excellent service management, which can be accomplished through structures such as a "accountable care organization (ACO)" or a "health maintenance organization (HMO)"[2]. The fall of Health Maintenance Organizations (HMOs) has a consistent trend across situations, with comparable underlying causes. These problems include an improper ethos, mismanagement, failure to control expenses, provider resistance, increased competition, and insufficient IT infrastructure, all of which can contribute to patient unhappiness [3].

The use of modern digital gadgets has become critical to improving consumer satisfaction. These gadgets allow for tracking, monitoring health state, and enhancing drug adherence. These features are especially useful during the post-hospitalization phase when using digital health systems. Customers in the healthcare industry, on the other hand, are often hesitant to share sensitive information. As a result, healthcare organizations (HCOs) must prioritize maintaining client confidence by displaying transparency, empathy, and dependability in their services. These features are especially useful during the post-hospitalization phase when using digital health systems. Customers in the healthcare industry, on the other hand, are often hesitant to share sensitive information. As a result, healthcare organizations (HCOs) must prioritize maintaining client confidence by displaying transparency, empathy, and dependability in their services. An Electronic Health Record (EHR) maintenance system that leverages Artificial Intelligence (AI) and blockchain technology has enormous potential to provide reliable, secure, and robust storage systems for EHRs [4].

Biomedical research advancements, such as genomics, digital medicine, artificial intelligence (AI), and machine learning (ML), pave the way for a healthcare transformation. These evolving technologies need a new work force and standard of practice. Genomics, coupled with other technologies like biometrics, tissue engineering, and vaccine industry breakthroughs, have the potential to improve and transform diagnostics, medicines, care delivery, regenerative treatment, and precision medicine models. Scientists who create extremely successful prototypes frequently lack the abilities required to deploy them. The skill sets required vary greatly throughout the value chain, from basic concept to ultimate implementation. Importantly, the art of analytics (implementation) is equally, if not more, important than the science of analytics (prototype generation). This topic is frequently emphasized by managerial epidemiologists [5].

Definitions and terms related to AI

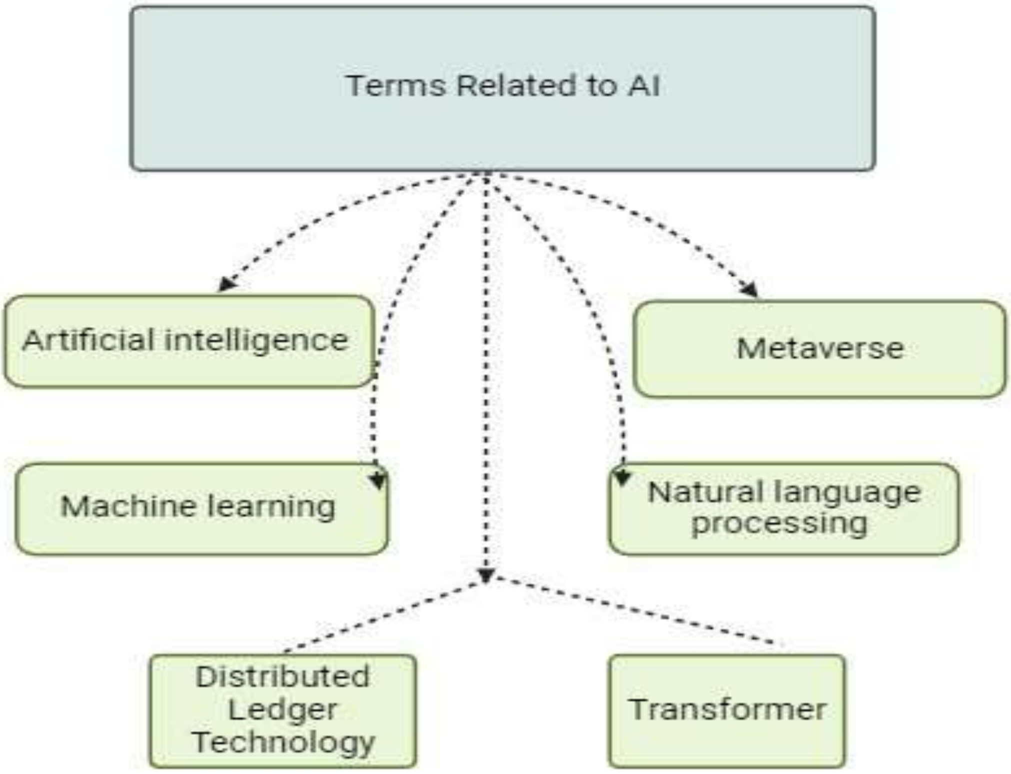

Fig 1. Terms Releated to AI

Terms	Definition
Artificial intelligence	Artificial intelligence (AI) often refers to computer systems that replicate mechanisms supported by human intelligence. These mechanisms include adaptation, deep learning, reasoning, engagement, and sensory comprehension, Artificial intelligence used for diagnosis in healthcare [6]. It is applicable to several forms of healthcare data, including unstructured and structured data. The goal of artificial intelligence (AI) is to mimic human cognitive abilities, which will revolutionize the medical field. The increasing accessibility of healthcare data and the quick development of analytics tools are the main forces behind this shift. In this analysis, we look at the state of AI applications in healthcare now and discuss potential future developments [7]. Within computer science, artificial intelligence (AI) is a powerful and disruptive field that has the potential to drastically alter medical practice and healthcare delivery [8].
Machine learning	Machine learning (ML) is a subset of Artificial Intelligence (AI) technology that aims to improve the speed and accuracy of physician tasks. Many countries are dealing with overcrowded healthcare systems and a dearth of competent physicians, making AI an appealing option. Machine Learning (ML) is a subset of AI technology that aims to improve the efficiency and accuracy of healthcare tasks [9]. Machine learning (ML) has played a critical role in improving patient care and data management. Machine learning allows medical personnel to collect, organize, and Analyze patient data more effectively. This allows them to recognize healthcare trends and prescribe therapies more precisely. Machine learning has the potential to improve decision-making and reduce risk in healthcare. While the business is still in the early stages of adopting machine learning, the stability of healthcare provides several job prospects in machine learning suited to the healthcare sector [10]. Machine learning is an important component of data science since it uses statistical approaches to train algorithms for a variety of tasks such as classification, prediction, and data mining. These algorithms aid in the extraction of important insights from data, which may then be used to drive decision-making processes in applications and enterprises, eventually influencing growth metrics. As the volume of data increases exponentially, so does the demand for experienced data scientists who are proficient in machine learning. These individuals are responsible for discovering relevant business questions, evaluating appropriate data sources, and generating actionable insights using machine learning algorithms [63].

Distributed Ledger Technology	distributed ledger technology (DLT)is a technology which is based on the distribution and sharing thats why it is also an important technology. DLT, or distributed ledger technology, is a decentralized data ledger that improves efficiency, reduces costs, and ensures immutability, traceability, security, and transparency. This article investigates how DLT can help small and medium-sized firms (SMEs) overcome the constraints to open innovation that they currently face [11]. Distributed Ledger Technology (DLT) enables enhanced and decentralized governance. Privacy and security are essential aspects of EHR deployment and adoption. These records are constantly updated anytime a patient visits a healthcare provider since they contain critical information regarding the patient's health and well-being. They also give a detailed record of the care received throughout time [12].
Metaverse	Neal Stephenson created the word "metaverse" in 1992. His science fiction novel "Snow Crash" delves into an immersive alternate virtual world and a universe connected via the internet. The metaverse is a three-dimensional (3D) virtual world on the internet in which people carry out daily activities using avatars that represent their real or imagined lives [13]. The Metaverse differs from augmented reality (AR) and virtual reality (VR) in three major ways. For starters, while VR research focuses on physical techniques and rendering, the Metaverse aims to serve as a long-term content and social platform. Second, the Metaverse does not rely just on augmented and virtual reality technologies. Even platforms that do not use VR or AR might be considered part of the Metaverse [14].
Natural language processing	Natural Language Processing (NLP) approaches are used to arrange narrative healthcare data. These methods can collect unstructured healthcare data, assess its grammatical structure, deduce meaning, and translate it for electronic healthcare systems. As a result, NLP reduces expenses while improving healthcare quality. Given the situation, the purpose of this research is to explore the applications, constraints, and NLP techniques used in healthcare [15].
Transformer	Transformers have shown great success in a variety of artificial intelligence disciplines, including natural language processing, computer vision, and audio processing. A variety of Transformer versions, often known as X-formers, have been suggested. However, a systematic and comprehensive literature review of these Transformer variants is yet missing [16].
Chat GPT	There has been a lot of interest in ChatGPT, an artificial intelligence interface that uses natural language processing and machine learning algorithms, and it is now a buzzword in many industries. In this perspective article, we shall outline the potential opportunities and risks that come with utilizing ChatGPT in data research. We aim to spur interest for chat GPT as an application in health care by underscoring its merits [17].

Table 1

Mobile health (mHealth), health information technology (IT), wearable devices, telehealth, telemedicine, and personalized medicine are some of the various categories of digital health.

Healthcare is being transformed by digital technology, which includes mobile medical apps, doctor decision-support software, artificial intelligence, and machine learning. These devices have the potential to greatly improve our ability to accurately identify and treat illnesses. Computing platforms, networking, software, and sensors utilized in healthcare and related fields are all examples of digital health technology. This technology's various uses include general wellness and medical devices; it may also be produced as a medical device, in combination with a medical product, as companion diagnostics, or as an addition to other products such as devices, pharmaceuticals, or biologics.

Artificial intelligence has advanced significantly over the years, mainly to the hard work of technology researchers and experts. The advantages of artificial intelligence are fast accelerating toward success. While no computer has yet equals a human's skills, AI is regarded as the beginning of a new era in technological development. Its evolution in business and other disciplines has been extremely significant. From healthcare to gaming, AI is making incredible progress, executing diverse tasks that were previously only possible by humans [19].

AI is making significant advances in fields ranging from healthcare to gaming, accomplishing numerous jobs that were previously only possible with humans. The review will look at AI's involvement in healthcare, focusing on key areas including (i) Virtual patent care (ii Medical imaging and diagnostics (iii) Medical research and drug discovery (iv) patient engagement and compliance, (v) Administrative application and (vi)Rehabilit5ation. The writers will also examine the issues connected with AI in healthcare. These studies aim to supplement existing material and expand the benefits of AI tools in healthcare.

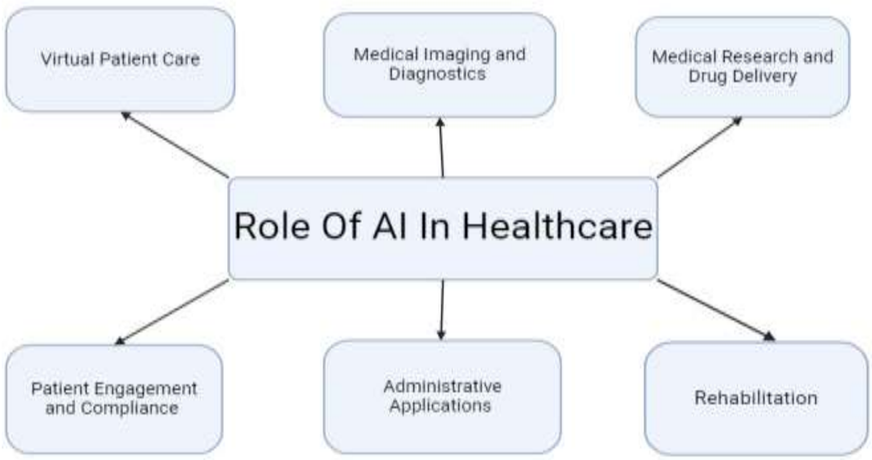

Fig 2. Role of AI in Healthcare

1. ROLE OF AI IN HEALTHCARE :

Virtual Patent Care :

Clinicians in acute and community care settings are increasingly using wearable patient monitoring (WPM) technologies. These technologies address a wide range of healthcare issues, including an aging population, chronic diseases, high hospitalization expenses, and the possibility of medical errors. Wearable patient monitoring (WPM) systems, which combine advanced sensors, wearable technologies, and secure communication platforms, have the ability to overcome these difficulties. This facilitates effective communication between professionals and patients, resulting in better healthcare results. Many research have focused on the system features of WPM solutions, such as sophisticated sensors, wireless data collecting, communication platforms, and clinical usability, with particular emphasis on certain areas or disorders. Current research is focusing on integrating localized sensors and software to meet specific use cases or health concerns. However, these solutions are frequently non-scalable and result in "silo" systems, limiting their overall application [19].

The recent boom in interest in wearable and mobile technologies has resulted in increased development into non-invasive glucose monitoring platforms. Continuous glucose monitoring is especially promising since it eliminates the constraints of traditional finger-stick blood tests, allowing for more rapid and effective therapeutic interventions. Recent publications show progress in human glucose monitoring using skin-worn electrochemical sensors. These epidermal biosensors have advantages over minimally invasive subcutaneous sensors, which could lead to improved glycaemic management. Their non-invasive nature suggests a possible strategy to improving diabetes control. However, fully exploiting their diagnostic potential necessitates overcoming technological barriers and establishing trustworthy correlations with gold standard blood glucose meters [20]. The rapid rise of digitization and automation has propelled growth in healthcare, resulting in creative models that provide new ways to deliver treatment at a cheaper cost. The Metaverse, an emerging digital technology, has enormous potential in healthcare since it allows patients and medical practitioners to have genuine experiences. It reflects the convergence of multiple enabling technologies, including as artificial intelligence, virtual reality, augmented reality, the Internet of Medical Devices, robots, quantum computing, and others [21].

Remote patient monitoring (RPM) is a popular healthcare tool that allows clinicians to monitor patients with chronic or acute illnesses from a distance, as well as provide care for the elderly at home or hospitalized patients. The success of manual patient monitoring systems is dependent on staff time management, which can be affected by workload. Conventional patient monitoring frequently employs invasive techniques that need skin contact to track health status. This study aims to provide a comprehensive analysis of remote patient monitoring (RPM) systems, including the integration of modern technologies, the impact of AI on RPM, and the difficulties and trends in AI-enabled RPM. The paper discusses the benefits and drawbacks of patient-centric RPM systems that use Internet of Things wearable devices and sensors, as well as cloud, fog, edge, and blockchain technologies [22].

Fig 3. wearable devices

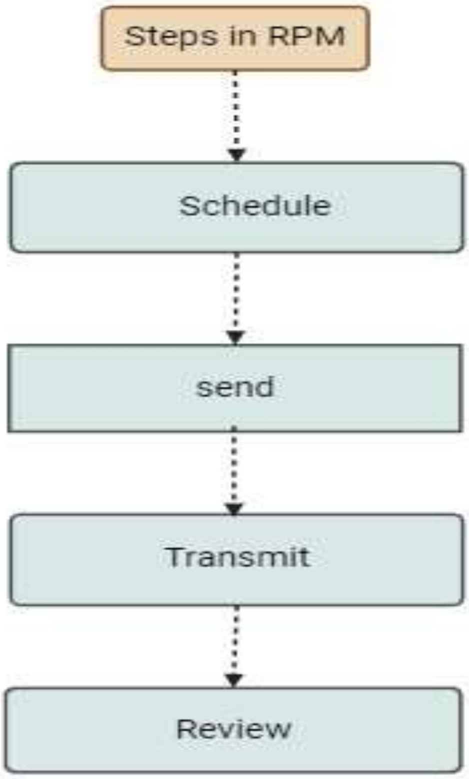

Fig 4. Remote patient monotoring

Medical imaging and diagnostics :

Artificial intelligence techniques, particularly those based on artificial neural networks, such as deep learning, have the potential to profoundly alter radiology. One of the most promising deep learning applications in this area is the use of generative adversarial networks (GANs). GANs are made up of two neural networks that are trained together but have opposing purposes. The generator network seeks to produce synthetic images that are indistinguishable from genuine photos, whereas the discriminator network seeks to discern between real and synthetic images. These models are useful for a variety of applications, including image synthesis, faster picture capture, reduced imaging artifacts, correct conversion between different imaging modalities, and detecting anomalies in medical images [23]. Deductive AI systems have received a lot of interest because of their capacity to evaluate vast datasets and discover patterns that would be difficult to express directly. In contrast, generative AI, including generative adversarial networks, is a more recent form of machine learning. These systems learn the features of real data and then generate synthetic data, providing distinct capabilities in data synthesis and manipulation [24].

Transformers have shown useful in a variety of full-stack clinical applications, including image synthesis/reconstruction, registration, segmentation, detection, and diagnosis. This paper aims to create knowledge about the various applications of transformers in medical image processing. It begins by providing an outline of the fundamental ideas of the attention mechanism built into transformers, as well as other critical components. Convolutional neural networks (CNNs) and their variants have demonstrated state-of-the-art (SOTA) performance in a variety of computer vision (CV) tasks [25]. During the COVID-19 pandemic, caused by the new coronavirus SARS-CoV-2, chest computed tomography (CT) scans emerged as a sensitive diagnostic tool, frequently outperforming reverse transcription polymerase chain reaction (RT-PCR) testing. However, the interpretation of COVID-19 findings on chest CT scans is generally undertaken manually by radiologists, which typically takes 5 to 15 minutes per patient [25]. In an ideal world, the Metaverse for Healthcare (MeTAI) would function as a platform for improving and integrating separate individual systems into a unified healthcare infrastructure. As the technologies that power the Metaverse advance, new features of this virtual realm will emerge, changing biomedicine and society. We anticipate that a biomedical Metaverse will provide benefits similar to computer-aided design tools in aerospace system engineering. Just as digital avatars of aircraft and spacecraft are rigorously tested and polished before actual production, the biomedical Metaverse could maximize healthcare plans and therapies before they are implemented in the real world [27].

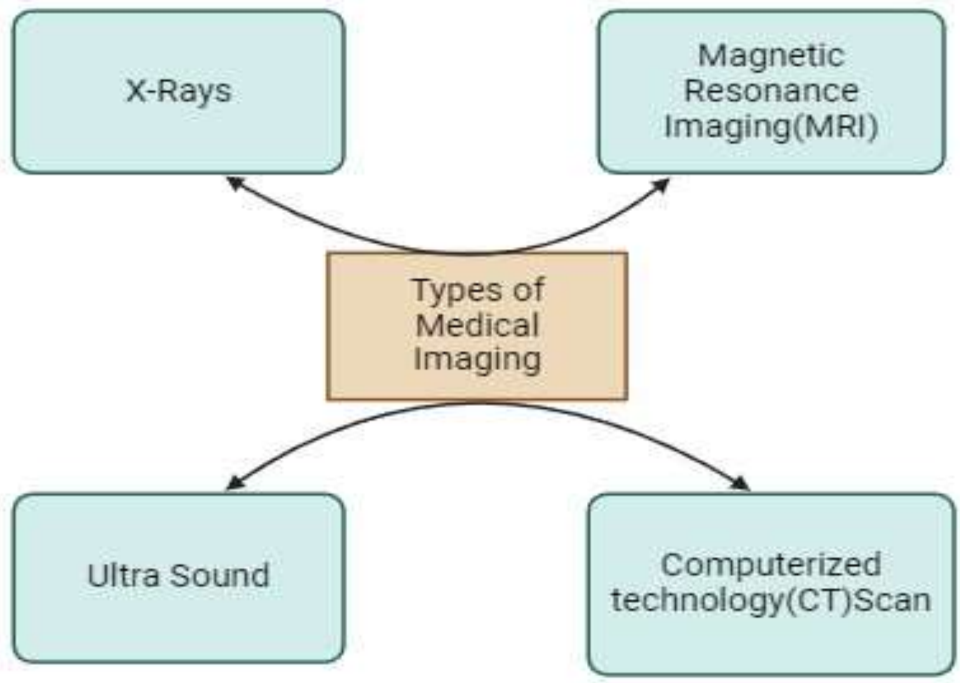

Fig 5. Medical Imaging

Types of Medical Imaging	Introduction
X-rays	X-rays, with wavelengths ranging from 0.01 to 10 nanometres, are an example of ionizing radiation. When X-rays travel through a medium, they can be transmitted, absorbed, or dispersed. Lambert-Beer's Law describes the ability of a material to attenuate X-rays, which determines the extent of scattering and absorption [28].
Magnetic Resonance Imaging	The use of magnetic resonance imaging (MRI) in medical diagnostics marks a considerable achievement, particularly in terms of reducing the requirement for ionizing radiation. As costs fall and accessibility improves, MRI is increasingly being used in everyday clinical practice [29].

Ultra Sound	An ultrasound device is made up of various components, including a transducer, a transmitter pulse generator, compensating amplifiers, a focusing control unit, digital processors, and displays. It is used for a wide range of medical tests, including abdominal, cardiac, maternity, gynaecological, urological, and cerebrovascular scans. In addition, ultrasonography is used for breast inspections, imaging tiny tissue samples, and paediatric and perioperative evaluations [30].
Computerized technology scan	CT scan imaging provides high-resolution images of the lungs, which is very valuable for patients with chronic respiratory disorders. Over the last few decades, extensive research has been conducted to generate new quantitative CT scan airway measurements capable of properly depicting aberrant airway architecture [31].

Table 2

Medical research and drug discovery:

AI is ideal for processing vast and complex datasets found in medical research [92]. It can also be used to search scientific studies, integrate various data kinds, and help with drug development. Pharmaceutical companies are increasingly using AI to expedite drug development procedures. Scientists can use predictive analytics to find potential candidates for clinical trials and construct precise models of biological processes [32]. Machine learning (ML) is now widely used in the design, conduct, and analysis of clinical trials. However, there has been no full review of the evidence for such applications. This paper reviews the findings of a multi-stakeholder meeting, with an emphasis on the current and future role of machine learning in clinical research. It focuses on certain areas of clinical trial technique where ML has considerable potential and identifies key areas for further research. The study also offers a narrative evaluation of the evidence supporting the use of ML at various stages of clinical trials [33].

Generative AI, particularly generative adversarial networks, is a new innovation in machine learning that creates synthetic data by learning from real-world attributes. The use of artificially created patient data has the potential to change clinical research while improving patient privacy. Datasets can now be completely anonymized using cutting-edge techniques, ensuring that no data point can be traced back to a real person. "AI systems have made great progress in making very realistic images, such as human faces and synthetic chest X-rays that are nearly indistinguishable from real ones. These breakthroughs show significant promise in the medical field. AI can be broadly classified into two types: deductive and generative. While much of the research on AI applications has concentrated on deductive systems, generative AI's promise in healthcare is becoming more widely recognized."[34].

The term "metaverse" refers to advanced virtual and augmented reality systems mixed with complex interactive and immersive surroundings. This virtual domain provides a space for people to connect without regard for physical distance or time limits. In education, the metaverse enables students and educators to collaborate in a 3D environment that simulates a genuine classroom, replete with interactive learning tools Metaverse technology enables the visualization of virtual 3D structures, improves collaboration and group activities, improves mentor-mentee relationships, provides chances for self-directed learning, and promotes collaborative development [35]. The Generative Pretrained Transformer, or GPT, is a revolutionary type of Artificial Intelligence (AI) capable of producing language that nearly mimics human writing. OpenAI created ChatGPT, an AI language model built on the GPT architecture. ChatGPT, which has been trained on a large text dataset, can react to natural language queries in a way that is comparable to human performance. This technique has several uses in healthcare. However, one of the most significant barriers to ChatGPT adoption in healthcare is the necessity for reliable and up-to-date data[36]. Language technology is fast evolving and on track to be the next great breakthrough. This includes complex chatbots such as ChatGPT, Jasperchat, DialoGPT, and Replika, as well as transcription technology like Otter.ai. Among these, ChatGPT stands out as a well-known model with impressive content generating capabilities. OpenAI developed ChatGPT, a large-scale language model at the forefront of this innovation [37].

Some applications of ChatGPT :

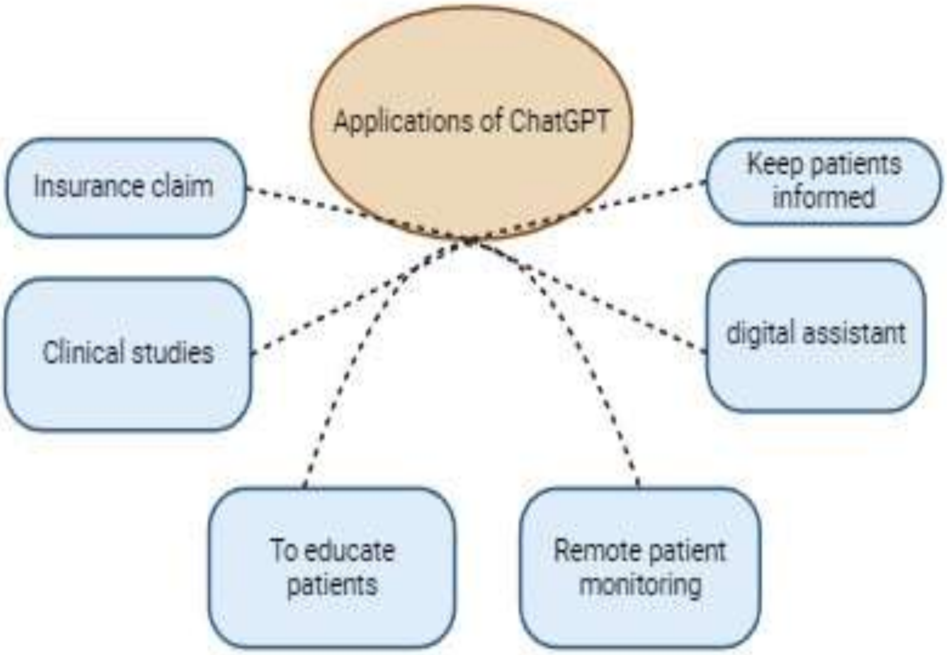

Fig 6. Applications of ChatGPT

Patient engagement and compliance:

Instead than focusing on a single technology, artificial intelligence incorporates a multitude of them. Many of these technologies have direct applications in healthcare, but they also serve a variety of other procedures and functions. Below, we outline and describe several specific AI technologies that are especially important in the healthcare industry. Technology companies and startups are currently solving similar concerns. For example, Google is collaborating with health delivery networks to create prediction models based on big data. These models are intended to alert clinicians to high-risk illnesses such as sepsis and heart failure. Google, Enclitic, and numerous other startups are currently developing AI-powered image interpretation algorithms. Jvion, for example, has created a 'clinical success machine' that can detect high-risk patients and those who are more likely to respond to specific treatment programs. These technologies have the ability to provide crucial decision assistance to physicians, supporting them in making the best diagnosis and treatment options for their patients [38].

Electronic health record (EHR) systems used in big, integrated healthcare delivery networks are frequently seen as monolithic, rigid, difficult to use, and costly to configure. These systems, which are often supplied from commercial suppliers, need significant time, money, and professional services to implement, support, and improve. The most popular systems are frequently built on older underlying technologies, which reflects in their simplicity of use. Many healthcare clinicians (including surgeon and author Atul Gawande) find these systems cumbersome and difficult to understand, and the EHR system is rarely a suitable fit with their preferred care delivery practices [39].

While many parts of healthcare necessitate direct patient connection, it is not always required for optimal treatment. ChatGPT has the potential to improve patient outcomes by increasing adherence to treatment programs and making therapy more comfortable and accessible. In healthcare, it is critical to limit ChatGPT's predictive capabilities. Transformer models, such as ChatGPT, are intended to detect patterns in training data and then utilize that information to create predictions. However, in medical settings, these models may produce erroneous predictions because they are motivated to discover patterns and make predictions based on them, even if the data is inadequate or deceptive[40].

Administrative applications;

AI and related developments are gaining acceptance across businesses and cultures, particularly in healthcare. While AI has immense potential to revolutionize healthcare, various ethical concerns must be addressed when adopting and making judgments about these systems. Some of the ethical problems that must be carefully evaluated include accountability and transparency in AI system decisions, the potential for harm caused by algorithmic prejudice, and the professional obligations and integrity of healthcare providers [41]. Providers may already extract data from free text using solutions like One Medical’s fax extraction software or Athena Health's EHR system. Google is cooperating with health delivery networks to create diagnostic and prediction algorithms based on big data. These algorithms are intended to alert clinicians to high-risk illnesses including sepsis and heart failure. Using natural language processing to collect clinical notes allows clinicians to focus on their patients rather than keyboards and computers [42]. Robotic Process Automation (RPA) allows healthcare personnel to focus on high-value tasks and make more informed decisions. RPA optimizes the value of its intelligent automation framework by leveraging structured data sources, as well as correct design, planning, and governance. RPA is not intended to replace human workers; rather, it seeks to elevate them by allowing them to focus on higher-value tasks that take advantage of their clinical experience. This technology enables human workers to become more committed to patient care and improves their positions in the sector [43].

Pharmacists must stay current on these developments in order to position themselves effectively while preserving personal ties with healthcare teams and patients. Collaborative efforts with data scientists are required to appropriately analyze whether AI-powered apps and technologies improve clinical pharmacy services in practical contexts [44]. The most recent advances in machine learning, notably deep learning, offer a substantial chance to meet this unmet need [45].

Rehabilitation:

AI has wide applications in field of rehabilitation, Machine learning, a form of artificial intelligence, is being used extensively in society, particularly in healthcare and research. It is the study of algorithms that improve spontaneously with experience. This page provides a fundamental overview of artificial intelligence, machine learning categories, frequent business applications, benefits and drawbacks of adopting this technology, and examples of uses in rehabilitation and other industries for context [46]. Technological advances, particularly in artificial intelligence and robotics, are changing the approaches and capacities of rehabilitation research and practice. This article looks at the use and research of robotics in rehabilitation, as well as assistive technology aimed to improve or maintain people's functional abilities. It also examines the human activity assistive technology paradigm, which serves as the conceptual foundation for this field's study and application. Continued advancements to existing technology, as well as the development of future breakthroughs, promise to improve rehabilitation methods and capacities, providing multiple benefits to rehabilitation experts, care providers, and clients [47]. Medical scribes receive training to document clinical information in real-time, aiding physicians in delivering patient care [48].

Artificial intelligence (AI) advancements are facilitating systems that enhance and work alongside humans to complete straightforward, mechanistic tasks like scheduling meetings and grammar-checking text. However, complex tasks, such as engaging in empathic conversations, present challenges for human-AI collaboration. AI systems encounter difficulties in understanding intricate human emotions and managing the open-ended nature of these tasks [49]. Artificial intelligence (AI) breakthroughs are resulting in systems that improve and collaborate with humans to execute simple, mechanical activities such as meeting scheduling and grammar checking. However, collaboration between humans and AI poses difficulties for more complex jobs, such as engaging in empathic interactions. AI systems struggle to comprehend complex human emotions and manage the open-ended nature of these activities [50].

2. RECENT TECHNOLOGICAL ADVANCEMENTS IN HEALTHCARE:

The last decade has seen tremendous technological developments in AI and data science. While AI research has been active for decades, the present wave of enthusiasm is unique. The convergence of elements such as faster computer processing, larger data gathering libraries, and a growing AI talent pool has resulted in rapid development of AI tools and technologies, including those used in healthcare [51]

The introduction of deep learning (DL) has had a huge impact on modern AI technologies and is a major driver of the recent excitement around AI applications. DL facilitates the detection of complicated relationships that were difficult to detect with previous machine learning algorithms. DL networks are based on artificial neural networks and feature more than 10 layers, as opposed to early neural networks, which had just 3-5 layers. This enables the simulation of millions of artificial neurons [51].

3. ADVANTAGES OF AI IN HEALTHCARE:

AI-enabled robots could be used in minimally invasive procedures to navigate around sensitive organs and tissues, thereby reducing blood loss, infection risks, and post-operative pain [52]. In medical imaging, AI can evaluate scans and X-rays, lowering the possibility of human error. AI also improves healthcare by analysing data to make better preventive care recommendations, so making it more predictive and proactive [53]. AI can automate many administrative and regular jobs in healthcare, such as record keeping, data entry, and scan analysis. By minimizing the time spent on these chores, medical personnel may focus on patient care [54]. AI is already critical in diagnostic imaging, dramatically lowering mistakes. It performs similarly to human radiologists, detecting early indicators of illnesses such as breast cancer [55] . drug development [56]. AI is transforming the medication discovery and development process, which has historically been time-consuming and expensive. AI algorithms can quickly identify possible drug candidates, estimate their effectiveness, and detect potential side effects by examining enormous quantities of molecular information [57].

4. DISADVANTAGES OF AI IN HEALTHCARE:

AI in healthcare creates a new set of concerns for data privacy and security. These difficulties are exacerbated by the need for most algorithms to access large datasets for training and validation reasons [58]. Artificial intelligence, such as robots, is displacing some jobs and, in some situations, contributing to more unemployment. Some argue that chatbots and robots will replace human workers, posing a risk of job losses [59]. As disease patterns alter, software algorithms will need to be updated to reflect these changes. However, continued updating might result in exponential cost rises [60]. For AI to succeed, constant training is essential, necessitating the collection of new data to handle emergent circumstances. However, this approach may require exchanging confidential data with the chatbot, such as medical or financial information, which is subsequently stored in digital databases. This raises concerns about potential hacking and privacy violations, highlighting a critical topic of our time [61]. Another possible disadvantage of AI in healthcare is its impact on accountability and responsibility. AI has the ability to foster new and complex relationships among the numerous players and stakeholders engaged in the delivery and access to health services [62].

CONCLUSION:

In conclusion, AI holds immense promise in revolutionizing healthcare by enhancing diagnostic accuracy, improving treatment outcomes, and streamlining administrative processes. However, it also presents challenges such as data privacy concerns, potential job displacement, and complex accountability issues. Despite these challenges, the continued development and responsible implementation of AI technologies have the potential to significantly improve patient care and transform the healthcare industry as a whole, and it also gives how AI changed the whole healthcare field.

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