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AI in Healthcare Practices

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Introduction

Artificial intelligence (AI) technologies are currently making their way into healthcare and becoming more common in the diagnosis and treatment of patients. Many elements of patient care and administrative operations can benefit from AI in healthcare, allowing healthcare practitioners to improve on existing solutions and overcome challenges more swiftly. The tactics that are enabled by artificial intelligence and healthcare technology may differ substantially across hospitals and other healthcare facilities, even though they are widely used in the healthcare sector [10]. Artificial intelligence in healthcare has been reported to perform as well as or better than humans in some operations, such as disease diagnosis, but it will be many years before AI in healthcare can replace humans for many different medical duties, such as surgical procedures, despite some articles to the contrary.

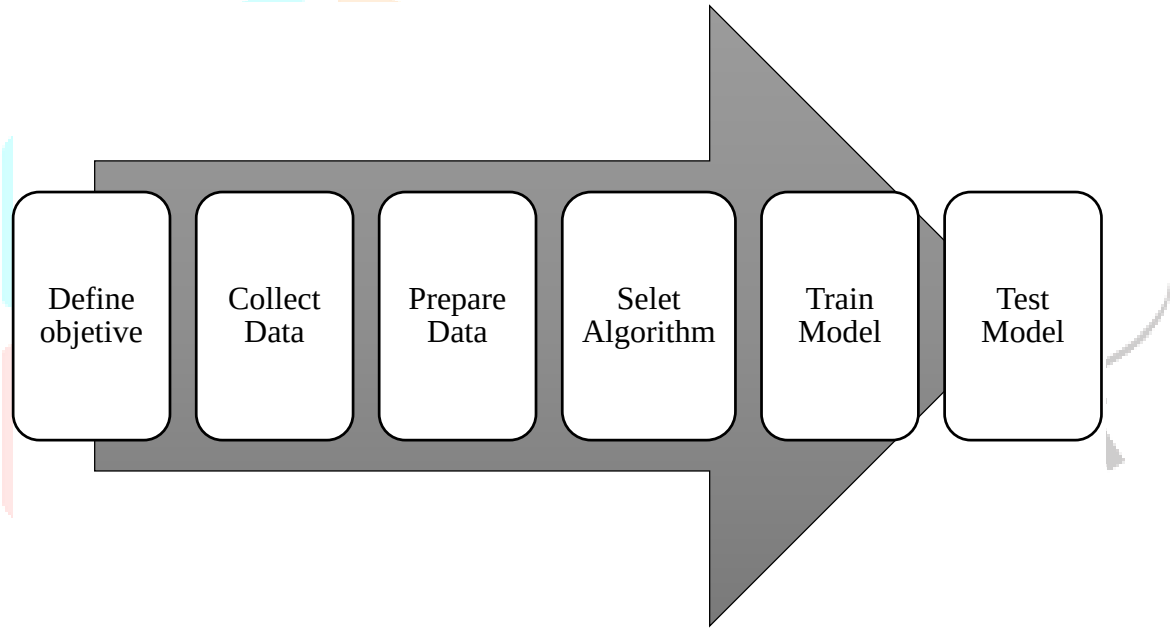
Machine Learning

Machine learning is one of the furthermost prevalent methods of artificial intelligence applied in the healthcare business. Many approaches to artificial intelligence and healthcare technology rely on this broad technique, which has been adapted in a variety of ways. Classical machine learning is the most extensively utilized method of implementing artificial intelligence in healthcare [3]. It's a big step onward for many healthcare administrations when they can predict which treatment approaches are most probable to flourish with patients founded on their genetic makeup and the treatment framework. Almost all AI in healthcare applications, such as machine learning and precision medicine, require data in directive to train, and the final consequence is already known. A kind of natural language processing known as deep learning is also used in healthcare to recognize speech in the form of automatic speech recognition (NLP). To distinguish between the model's results and those of the model's observers, it may be difficult to do so since characteristics in deep learning replicas have minimal value to human witnesses.

Medical machine learning has made great progress in healthcare [8]. Watson's oncology treatment plans are based on an in-depth analysis of each patient's medical history, making it an obvious leader in the field. The capacity to construct tailored treatment regimens will only become better as better biosensors become more generally available, providing more data for algorithms.

In the future, Microsoft's InnerEye project will transform healthcare data processing. Computer Vision is used to analyze medical images in order to establish a diagnosis for this startup. InnerEye (14, 15) is on the rise when it comes to healthcare analytics software. An even greater amount of data will be able to be analyzed in the near future so that an automatic diagnostic may be generated. Clinical trials can take years to complete and need significant financial investments, as is well known. Machine learning can select the best candidates for clinical trials based on variables such as a person's history of doctor visits or social media activity. As an additional benefit, this method may be able to propose the proper sample sizes for testing [15]. In the very early stages of pharmaceutical development, machine learning can also be used to the advantage of patients. Microsoft's Project Hanover was charged with identifying personalized drug combinations to treat Acute Myeloid Leukemia and is now integrating artificial intelligence-based technology.

The diagram below illustrates the workflow process of machine learning in healthcare informatics;

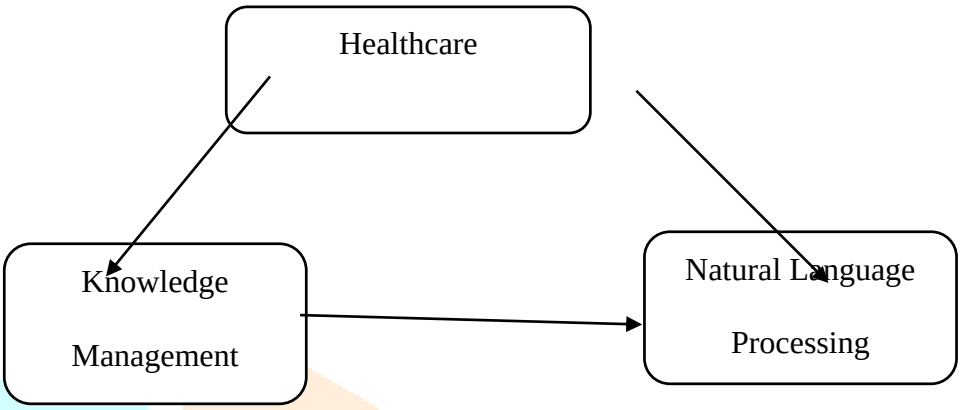


Natural Language Processing

The objective of artificial intelligence and healthcare technology has remained to develop technology that can comprehend human linguistic. For the vast popular of NLP systems, speech acknowledgement or text exploration is used first, and then a translation is applied. Natural language processing (NLP) algorithms, which can detect and categorize clinical content, commonly use artificial intelligence in healthcare [4]. Clinical notes may be evaluated using natural language processing systems, which provide a wealth of information on the patient's health and a better treatment plan for the patient. This technology may help medical facilities manage their online reputations, as well. Each day, it may collect and evaluate thousands of healthcare reviews from third-party listings [12], which the firm collects and evaluates. Protected Health Information, or PHI, may also be detected by NLP, along with profanity and other information pertinent to HIPAA's regulations. Human emotions and the environment in which they are expressed may be analyzed in real-time by this technology. It's possible for certain systems to

record customers' voices so that doctors may better grasp how individuals talk about their treatment and communicate more effectively by using a common vocabulary [13]. Natural language processing (NLP) may also be used to track customer attitudes, which distinguishes good and negative terms in reviews [16].

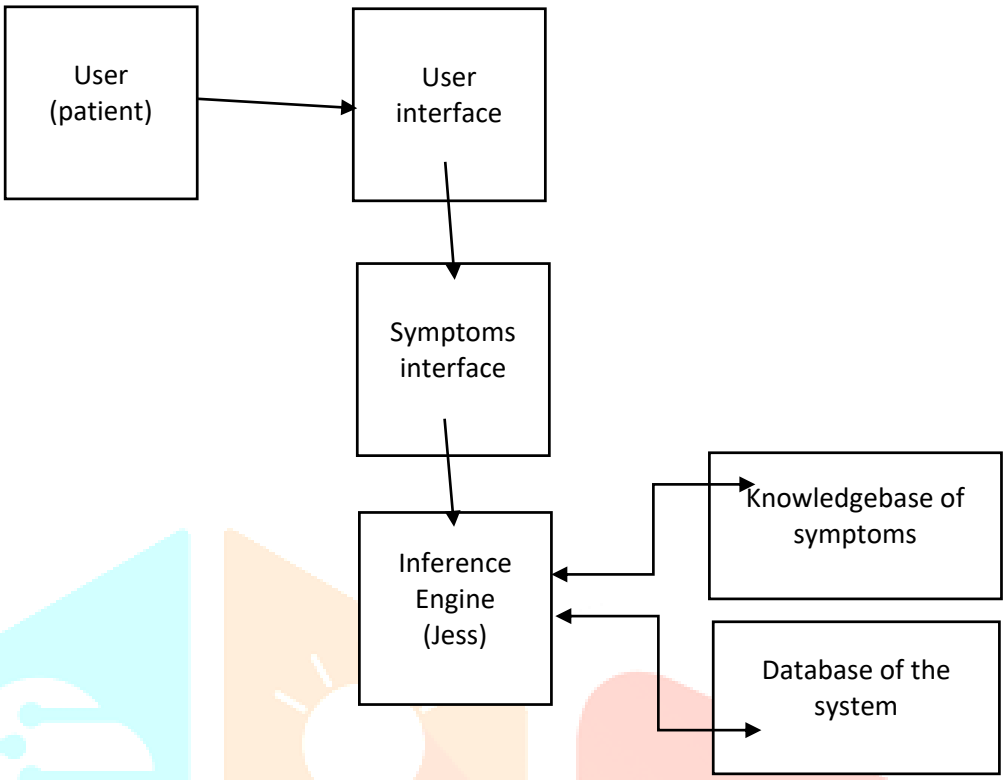
The diagram below depicts a methodical evaluation of Natural language processing of information organization in healthcare;



Rule-based Expert Systems

The implementation of AI in healthcare is frequently applied for medical judgment help until today [2]. Expert systems based on versions of 'if-then' procedures remained the dominant method for AI in healthcare in the past and future years [1]. Electronic health record systems (EHRs) now create accessible a set of regulations with the software resolutions [5]. Expert systems generally need human professionals and plans to construct a widespread sequences of instructions in a definite knowledge area [7].

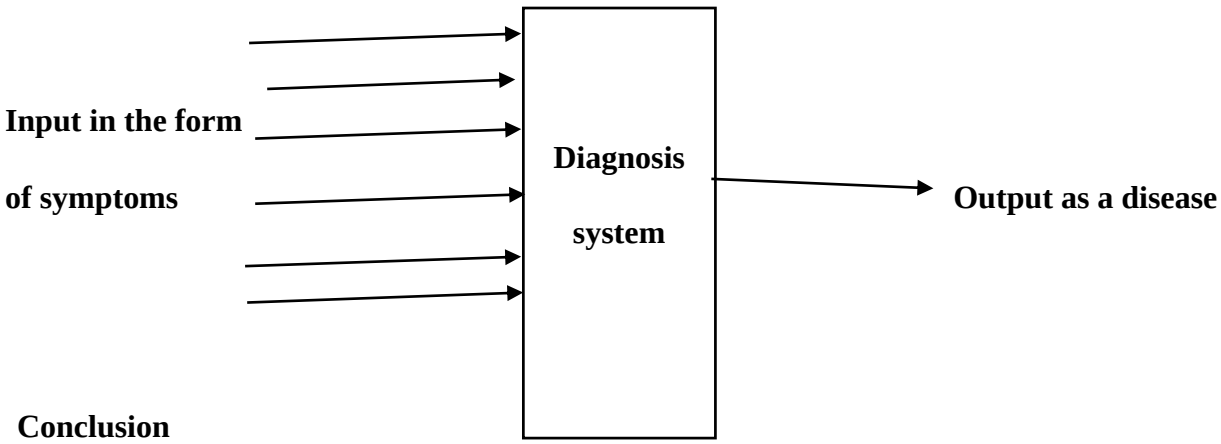
Below is a diagram of expert system Architecture;



Diagnosis and Treatment Applications

In healthcare, artificial intelligence (AI) has been at the forefront of illness detection and treatment for the past half a century [6]. It was not widely accepted in clinical practice at the time of their inception that early rule-based systems could precisely diagnose and treat illness. Many situations of their incorporation with physician workflow and electronic health record systems were less than ultimate, making them less effective than humans at diagnosing. Artificial intelligence in healthcare for diagnosis and treatment planning can be problematic to integrate with medical procedures and electronic health record systems, whether rules-based or algorithmic. Integration issues have been found to be a more significant barrier to the widespread usage of artificial intelligence in healthcare [9] than accuracy problems. For the most part, medical software businesses' AI and healthcare diagnostic and treatment skills target a specific care area. In the early stages of development, several EHR software vendors included limited healthcare analytics driven by artificial intelligence into their product offerings. An EHR system that doesn't interface with an AI-capable third-party vendor may not be able to take complete benefit of the usage of artificial intelligence in healthcare unless the provider or third-party vendor undertakes extensive integration initiatives.

Below is a diagram of the medical diagnosis system;



Conclusion

Several aspects of health care are already benefiting from artificial intelligence (AI), and this progress is expected to continue in the future. It'll likely play a bigger role in supporting clinical and other applications in the future, leading to better treatments and operations that are both wise and successful. When it comes to health care, artificial intelligence (AI) has many uses. As data becomes more interoperable, it is predicted to become a vital engine for analytics, insights, and decision-making [11]. Artificial intelligence can help organizations save money in the short term. Still, it can also help them achieve a competitive edge in the long run by helping them improve their goods and services and better connect with their customers. AI's biggest challenge in healthcare is not deciding if the technology is advanced enough to be useful but rather ensuring that it gets integrated into ordinary clinical practice. Possibly, doctors may gravitate toward employment that needs specific human qualities, such as those that require the highest degree of cognitive functioning. It's possible that only healthcare professionals who refuse to work with AI will fall short of realizing AI's full potential in healthcare.

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