Short Communication

Journal of
Medical Research and Surgery

Tewes FR, J Med Res Surg 2022, 3:5

Artificial Intelligence in the American Healthcare Industry: Looking Forward to 2030

Federico R. Tewes*

6231 PGA BLVD, Suite 104-326, Palm Beach Gardens, FL 33418, United States

Correspondence to: Federico R. Tewes, 6231 PGA BLVD, Suite 104-326, Palm Beach Gardens, FL 33418, United States
Received date: September 16, 2022; **Accepted date:** October 03, 2022; **Published date:** October 10, 2022

Citation: Tewes FR. Artificial Intelligence in the American Healthcare Industry: Looking Forward to 2030. *J Med Res Surg.* 2022;3(5): 107-108. doi: 10.52916/jmrs224089

Keywords:

Healthcare, Artificial Intelligence, Diagnosis, Disease, Sequencing

Introduction

Artificial intelligence (AI) has the potential to speed up the exponential growth of cutting-edge technology, much way the Internet did. Due to intense competition from the private sector, governments, and businesspeople around the world, the Internet has already reached its peak as an exponential technology. In contrast, artificial intelligence is still in its infancy, and people all over the world are unsure of how it will impact their lives in the future.

Artificial intelligence, is a field of technology that enables robots and computer programmes to mimic human intellect by teaching a predetermined set of software rules to learn by repetitive learning from experience and slowly moving toward maximum performance. Although this intelligence is still developing, it has already demonstrated five different levels of independence. Utilized initially to resolve issues. Next, think about solutions. Third, respond to inquiries. Fourth, use data analytics to generate forecasts. Fifth, make tactical recommendations. Massive data sets and "iterative algorithms," which use lookup tables and other data structures like stacks and queues to solve issues, make all of this possible. Iteration is a strategy where software rules are regularly adjusted to patterns in the data for a certain number of iterations. The artificial intelligence continuously makes small, incremental improvements that result in exponential growth, which enables the computer to become incredibly proficient at whatever it is trained to do. For each round of data processing, the artificial intelligence tests and measures its performance to develop new expertise. In order to address complicated problems, artificial intelligence aims to create computer systems that can mimic human behavior and exhibit human-like thought processes [1].

Artificial intelligence technology is being developed to give individualized medication in the field of healthcare. By 2030, six different artificial intelligence sectors will have considerably improved healthcare delivery through the utilization of larger, more accessible data sets.

The first is machine learning. This area of artificial intelligence learns automatically and produces improved results based on identifying patterns in the data, gaining new insights, and enhancing the outcomes of whatever activity the system is intended to accomplish. It does this without being trained to learn a particular topic. Here are several instances of machine learning in the healthcare industry. The first is the IBM Watson Genomics, which aids in rapid disease diagnosis and identification by fusing cognitive computing with genome-based tumour sequencing. Second, a project called Nave Bayes allows for the prediction of diabetes years before an official diagnosis, before it results in harm to the kidneys, the heart, and the nerves. Third, employing two machine learning approaches termed classification and clustering to analyse the Indian Liver Patient Data (ILPD) set in order to predict liver illness before this organ that regulates metabolism becomes susceptible to chronic hepatitis, liver cancer, and cirrhosis [2].

Second, deep learning. Deep learning employs artificial intelligence to learn from data processing, much like machine learning does. Deep learning, on the other hand, makes use of synthetic neural networks that mimic human brain function to analyse data, identify relationships between the data, and provide outputs based on positive and negative reinforcement. For instance, in the fields of Magnetic Resonance Imaging (MRI) and Computed Tomography (CT), deep learning aids in the processes of picture recognition and object detection. Deep learning algorithms for the early identification of Alzheimer's, diabetic retinopathy, and breast nodule ultrasound detection are three applications of this cutting-edge technology in the real world. Future developments in deep learning will make considerable improvements in pathology and radiology pictures [3].

Third, neural networks. The artificial intelligence system can now accept massive data sets, find patterns within the data, and respond to queries regarding the information processed because the computer learning process resembles a network of neurons in the human brain. Let's examine a few application examples that are now applicable to the healthcare sector. According to studies from John Hopkins University, surgical errors are a major contributor to medical malpractice claims since they happen more than 4,000 times a year in just the United States due to the human error of surgeons. Neural networks can be used in robot-assisted surgery to model and plan procedures, evaluate the abilities of the surgeon, and streamline surgical activities. In one study of 379 orthopaedic patients, it was discovered that robotic surgery using neural networks results in five times fewer complications than surgery performed by a single surgeon. Another application of neural networks is in visualising diagnostics, which was proven to physicians by Harvard University researchers who inserted an image of a gorilla to x-rays. Of the radiologists who saw the images, 83% did not recognise the gorilla. The Houston Medical Research Institute has created a breast cancer early detection programme that can analyse mammograms with 99 percent accuracy and offer diagnostic information 30 times faster than a human [4].

Cognitive computing is the fourth. Aims to replicate the way people and machines interact, showing how a computer may operate like the human brain when handling challenging tasks like text, speech, or image analysis. Large volumes of patient

data have been analysed, with the majority of the research to date focusing on cancer, diabetes, and cardiovascular disease. Companies like Google, IBM, Facebook, and Apple have shown interest in this work. Cognitive computing made up the greatest component of the artificial market in 2020, with 39% of the total [5]. Hospitals made up 42% of the market for cognitive computing end users because of the rising demand for individualised medical data. IBM invested more than $1 billion on the development of the WATSON analytics platform ecosystem and collaboration with startups committed to creating various cloud and application-based systems for the healthcare business in 2014 because it predicted the demand for cognitive computing in this sector.

Natural Language Processing (NLP) is the fifth. This area of artificial intelligence enables computers to comprehend and analyse spoken language. The initial phase of this pre-processing is to divide the data up into more manageable semantic units, which merely makes the information simpler for the NLP system to understand. Clinical trial development is experiencing exponential expansion in the healthcare sector thanks to NLP. First, the NLP uses speech-to-text dictation and structured data entry to extract clinical data at the point of care, reducing the need for manual assessment of complex clinical paperwork. Second, using NLP technology, healthcare professionals can automatically examine enormous amounts of unstructured clinical and patient data to select the most suitable patients for clinical trials, perhaps leading to an improvement in the patients' health [6].

Computer vision comes in sixth. Computer vision, an essential part of artificial intelligence, uses visual data as input to process photos and videos continuously in order to get better results faster and with higher quality than would be possible if the same job were done manually. Simply put, doctors can now diagnose their patients with diseases like cancer, diabetes, and cardiovascular disorders more quickly and at an earlier stage. Here are a few examples of real-world applications where computer vision technology is making notable strides. Mammogram images are analysed by visual systems that are intended to spot breast cancer at an early stage. Automated cell counting is another example from the real world that dramatically decreases human error and raises concerns about the accuracy of the results because they might differ greatly depending on the examiner's experience and degree of focus. A third application of computer vision in the real world is the quick and painless early-stage tumour detection enabled by artificial intelligence. Without a doubt, computer vision has the unfathomable potential to significantly enhance how healthcare is delivered. Other than for visual data analysis, clinicians can use this technology to enhance their training and skill development. Currently, Gramener is the top company offering medical facilities and research organisations computer vision solutions [7].

The usage of imperative rather than functional programming languages is one of the key difficulties in creating artificial intelligence software. As artificial intelligence starts to increase exponentially, developers employing imperative programming languages must assume that the machine is stupid and supply detailed instructions that are subject to a high level of maintenance and human error. In software with hundreds of thousands of lines of code, human error detection is challenging. Therefore, the substantial amount of ensuing maintenance may become ridiculously expensive, maintaining the high expenditures of research and development. As a result, software developers have contributed to the unreasonably high cost of medical care.

Functional programming languages, on the other hand, demand that the developer use their problem-solving abilities as though the computer were a mathematician. As a result, compared to the number of lines of code needed by the programme to perform the same operation, mathematical functions are orders of magnitude shorter. In software with hundreds of thousands of lines of code, human error detection is challenging. Therefore, the substantial amount of ensuing maintenance may become ridiculously expensive, maintaining the high expenditures of research and development. As a result, software developers have contributed to the unreasonably high cost of medical care. Functional programming languages, on the other hand, demand that the developer use their problem-solving abilities as though the computer were a mathematician. As a result, compared to the number of lines of code needed by the programme to perform the same operation, mathematical functions are orders of magnitude shorter. The bulk of software developers that use functional programming languages are well-trained in mathematical logic; thus, they reason differently than most American software developers, who are more accustomed to following step-by-step instructions.

The market for artificial intelligence in healthcare is expected to increase from $3.4 billion in 2021 to at least $18.7 billion by 2027, or a 30 percent annual growth rate before 2030, according to market research firm IMARC Group. The only outstanding query is whether these operational reductions will ultimately result in less expensive therapies.

Conflict of Interest

The author declare no competing financial interest.

Funding

No.

References

1. https://csuglobal.edu/blog/how-does-ai-actually-work.

2. https://spd.group/machine-learning/machine-learning-in-healthcare/.

3. https://research.aimultiple.com/deep-learning-in-healthcare/.

4. https://merehead.com/blog/neural-networks-health-industry-cases/.

5. https://www.marketwatch.com/press-release/cognitive-computing-in-healthcare-market-2022-size-share-growth-rate-key-players-market-dynamics-trends-challenges-recent-developments-revenue-type-and-application-market-insights-and-forecast-to-2031-2022-07-27.

6.https://global.hitachi-solutions.com/blog/nlp-in-healthcare/.

7. https://blog.gramener.com/computer-vision-in-healthcare/.