

Artificial Intelligence: The Future of Healthcare

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Man Vs Machine

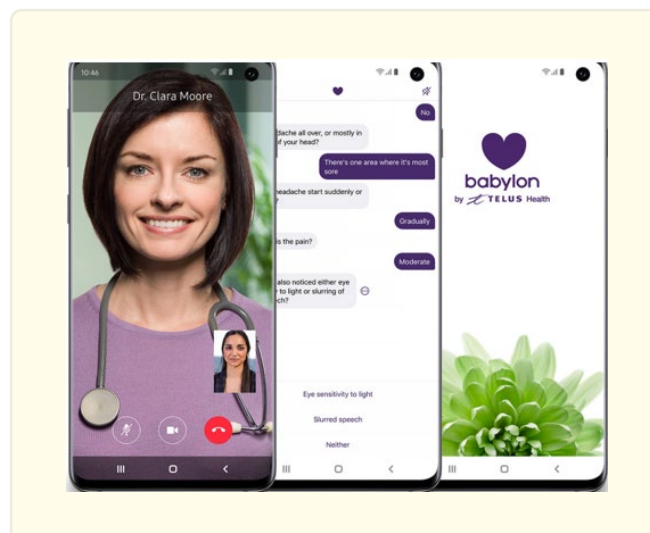
Man gets tired, but machines don't get tired. Man can become emotional at times, but Machines do not allow emotion to influence their judgement. And finally, Machines make decisions faster and machines can be programmed to learn more rapidly than humans.

Ai In Everyday Life

Artificial intelligence-the use of intelligent machines to work and react like humans is already a part of our daily lives. Facial recognition at passport control and voice recognition on virtual assistants such as Alexa and Siri are already with us. Driverless cars or companion robots that care for the elderly are undergoing trials. Well, it is hard to think of any area of our lives that will not be affected by this nascent data driven technology.

Ai In Healthcare

Artificial Intelligence is already with us in healthcare too. Google's DeepMind has taught machines to read retinal scans with at least as much accuracy as an experienced junior doctor. Babylon, the health app start-up, claims its chatbot has the capacity to pass GP exams although this is contested by the Royal College of General Practitioners.



Ai Is New Electricity

AI is the new electricity. Just as electricity transformed everything 100 years ago, AI will transform every industry in next few years.

'AI IS THE NEW ELECTRICITY'

“Just as electricity transformed almost everything 100 years ago, today I actually have a hard time thinking of an industry that I don't think AI will transform in the next several years.”

Andrew Ng
Former chief scientist at Baidu, Co-founder at Coursera

The Big Debate

A big debate is going on. Some say that AI is going to provide instant relief to many of the pressures healthcare systems across the world are facing. While others claim that AI is little more than snake oil and can never replace human delivered care. Scientific progress is about many small steps and occasional big leaps. Medicine is no exception. AI and its application in healthcare could be another great leap, like population wide vaccination or IVF. But AI must be handled with care.

AI is a medical marvel. AI can go where humans can't. TOI, May 21, 2023 article.

Medical Marvel: AI Can Go Where Humans Can't
Though Apprehensions Remain, Health Experts Say Artificial Intelligence Can Play Huge Role in Furthering Advancements

HOW AI MAY TRANSFORM HEALTH SECTOR

- Detect pre-cancer growth during screening
- Predict possible health conditions
- Detect life-threatening conditions
- Personalise medicine
- Discover & test new medicines
- Boost for remote areas
- Discover & test new medicines
- Identify efficacy of drugs for individual patients

The article discusses how AI can detect early-stage cancer, predict health conditions, and discover new medicines. It also mentions the potential for AI to boost remote areas and identify drug efficacy for individual patients. However, it also notes that AI is not a magic bullet and that human oversight is still crucial. The article mentions that AI can detect early-stage cancer, predict health conditions, and discover new medicines. It also mentions the potential for AI to boost remote areas and identify drug efficacy for individual patients. However, it also notes that AI is not a magic bullet and that human oversight is still crucial.

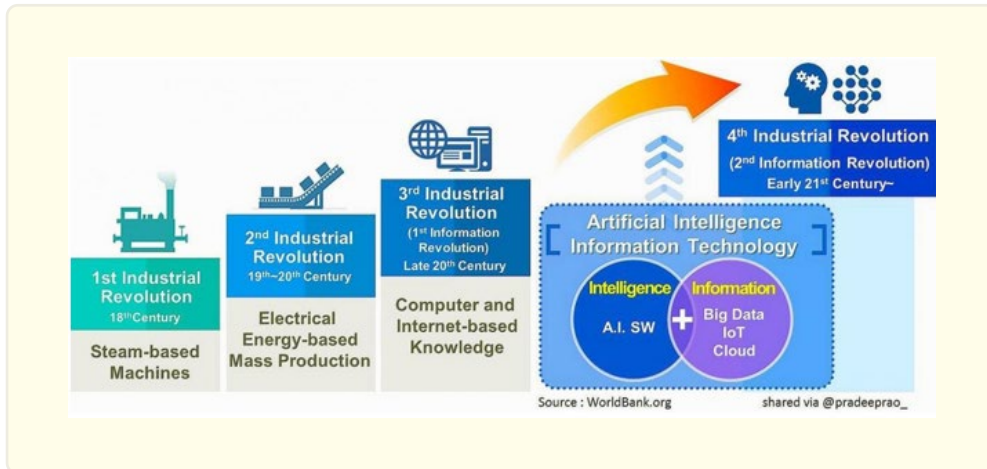
Bill Gates has remarked that humans should be worried about the threat posed by Artificial Intelligence. Remember the video of a smart home, where a subtle change in the voice of the man after a tooth extraction fails to open the door of his home.

While AI promises great benefits to patients, it equally presents risks to patients safety, health equity and data security.

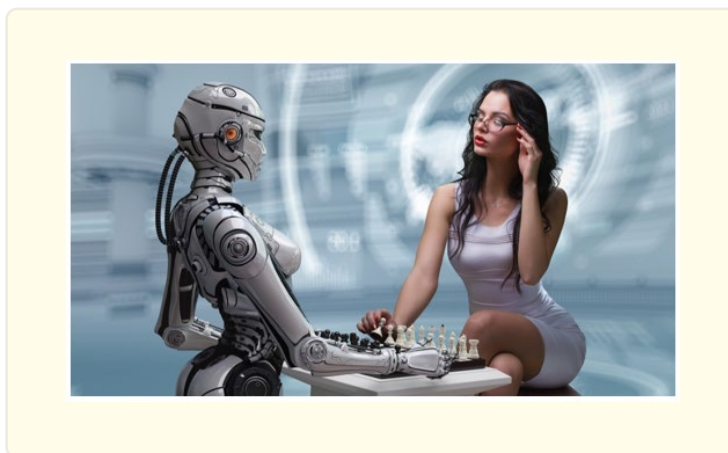
What is AI?

AI in simple words is a part of science where machines are loaded with algorithms that let them work as humans. AI could detect dementia before symptoms. By training computers to analyze brain scans, scientists were able to spot subtle signs of dementia that were missed by humans, enabling earlier diagnosis.

AI is a part of fourth Industrial revolution after steam-based machines, electrical-energy based mass production and computer and Internet-based knowledge. It combines big data, IoT (Internet of Things), Cloud and AI.



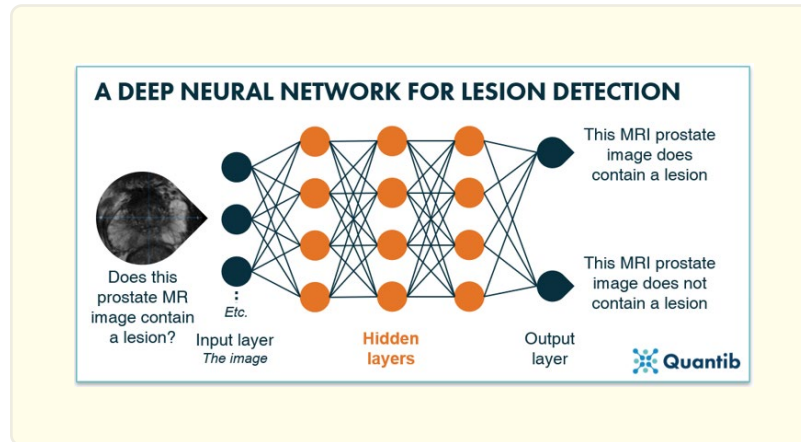
AI is the technology building smart machines able to perform tasks that generally need Human Intelligence in machines that are programmed to think and act like humans. If machine is well programmed, it can even play a game of chess with you!



Key Components

AI involves deep learning, machine learning, neural network, cognitive computing and natural language processing (NLP). Neural networks function by having many interconnected neurons. The connections between these neurons get stronger if they help the machine to arrive at the correct answer and weaken if they do not help to reach correct answer. The system itself is made up of an input

layer, some hidden layers and an output layer. There are huge connections between each layer that can be refined. Over time, these billions of refinements can hone an algorithm that is very successful at the task.



3 Limitations

- Explain ability: Decisions are based on huge number of connections between neurons, so it is difficult for a human to understand how the conclusion was reached.
- Data requirement: Neural networks need to be trained on a huge amount of accurate and reliable data. Health data is often heterogeneous, complex and poorly coded.
- Transferability: Algorithms may be well optimized for a specific task they have been trained on but may be confidently incorrect on data it has not seen before.

"Predicting the future isn't magic, it's artificial intelligence". - Dave Waters

Market Size

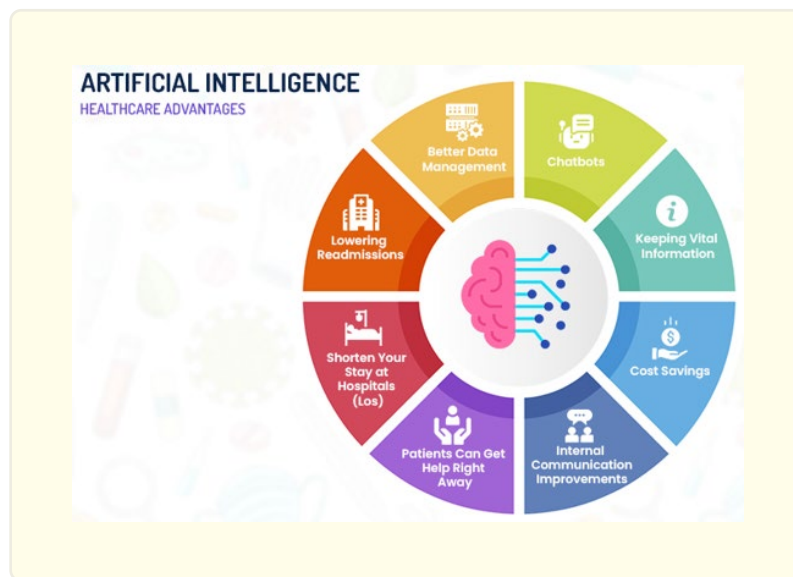
The global artificial intelligence (AI) market size was estimated at US\$ 119.78 billion in 2022 and it is expected to hit US\$ 1,591.03 billion by 2030 with a registered CAGR of 38.1% from 2022 to 2030. There are many reasons for this projected growth:

- The rapid penetration of the digital technologies and internet.
- The burgeoning demand for the artificial technology among the various end use verticals such as automotive, healthcare, banking & finance, manufacturing, food and beverages, logistics, and retail.
- The top global tech giants such as Google, Microsoft, IBM, Amazon, and Apple are increasing their investments in AI.

Applications of Ai in Healthcare

- Diagnostic aid.
- Treatment design.
- Precision medicine.
- Disease progression.
- Drug discovery.
- Health monitoring.
- Managing Data and records.

Advantages of AI



Will The Patients Be Safe or Safer?

- Algorithms could standardize tests, prescriptions and even procedures across the healthcare systems, being kept up to date with the latest guidelines in the same way a phone's operating system updates itself from time to time.
- Advice on specialist areas of medicine could be delivered locally and in real time.
- Direct-to-patient services could provide digital consultations regardless of time of day, geography or verbal communication needs including language.

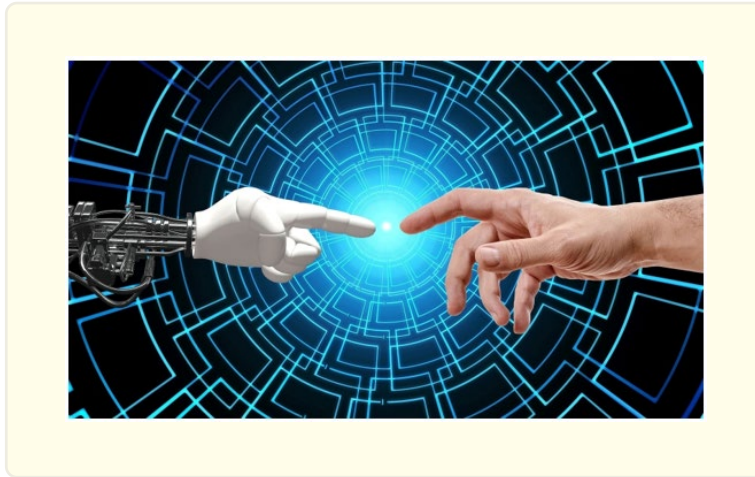
Clinical, Ethical & Practical Perspectives?

The scope of discussion of the possible implications of AI in future healthcare is almost limitless. There are many unanswered clinical, ethical and practical perspectives.

- Patient safety.
- Doctor patient relationship.
- Public acceptance and trust.
- Accountability for decisions.
- Bias, inequality.
- Data quality, consent.
- Training and education.
- Regulatory environment.
- Intellectual property.
- Financial impact on healthcare system.
- Impact on doctors' lives.

Doctor and Patient Relationship

For centuries, the doctor held exclusive knowledge and issued 'orders'. Today, doctors are expected to take a holistic approach, providing care that is tailored to each patient's wishes and based on shared decision-making.



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