WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 13, Issue 1, 1774-1778. Review Article ISSN 2277–7105

# A BRIEF REVIEW ON ARTIFICIAL INTELLIGENCE & ROBOTICS IN PHARMA SECTOR

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Article Received on
18 Nov. 2023,

Revised on 08 Dec. 2023,
Accepted on 28 Dec. 2023

DOI: 10.20959/wjpr20241-30873

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## ABSTRACT

Currently we are living in the era of technology and advancement through a lot of research works and innovations. In this technology filled world the role of artificial intelligence & robotics is dominant. Artificial Intelligence can be defined as the branch of science which describes the ability of a computer or computer enabled robotic system to process information and produce outcomes similar to the thought process of human beings. In every field AI has various use. AI contains various powerful tools and technique which are very useful especially for the business and programming point of view. Robotics can be defined as the important component of AI, which deals with the study of preparing brilliant as well as systematic robots.

**KEYWORDS:** Artificial intelligence, Robotics, Humans, Techniques.

## INTRODUCTION

### Artificial intelligence

Artificial intelligence is a branch of science which deals with assisting machines to find the resolution of complex problem in a more human like fashion. This system mainly includes characteristics from human intelligence, correlated them as algorithms in computer easy way. It can be also expressed as the science and technology of making intelligent machines, especially intelligent computer programs. In the year of 1956, the term 'Artificial Intelligence' was introduced. But nowadays the Artificial Intelligence has been an essential part of our latest modern technology. It has a wide application in our pharmaceutical field & healthcare field. These are mentioned below.

**Applications**

- For the identification of disease.
- For the personalized treatment.
- For the drug discovery.
- For the manufacturing of drugs.
- For the clinical research department.

**Ai for the identification of diseases**

Ai can be useful for the identification of diseases. Through artificial intelligence, the identification or detection of diseases will be much easier. Through all the necessary tools, artificial intelligence can assess the disease by analyzing all factors like genetic factors, environmental factors and living life style factors. Artificial intelligence has a high use as application in smartphone to monitor all health records like walking steps, travelled distance, exercise data, sleeping cycle etc. It is also used in smartwatches to measure all vital signs like blood pressure, heart rate etc. So, it can be possible to identify any change, which indirectly indicates about the progress of disease.

**Ai for the personalized treatment**

Artificial intelligence has emerged as a helpful tool for the personalized treatment also. The researchers in the China and United States have developed an AI based diagnostic tool named as Meta-Spec. Meta-Spec easily collects all physical & living lifestyle data for example diet & age etc. By the help of deep learning and micro biosensors it may be useful. There is also an app which is available on the google play store as ‘DermCheck’ which send images to the dermatologist directly.

**Ai for the drug discovery**

Since drug discovery is a long and time taking process, AI can be helpful in drug discovery. In drug discovery various molecular compounds are tested for a particular drug. The more compounds are tested then the cost will also higher. AI can be helpful for choosing the right compounds which may me more successful by going through the chemical structures and properties. This will reduce the time and cost of the R&D company. In recent years many companies have shown interest for using Artificial intelligence in the drug discovery.

**Ai for the manufacturing of drugs**

Artificial intelligence in the manufacturing of drugs will boost the production or manufacturing. Ai can be useful in many ways to make the entire manufacturing process more efficient with the faster rate output. This will also lead to the less wastage of raw material. Many Pharma companies have started showing interest for the AI in the manufacturing process, which is showing relevant growth for the upcoming years.

**Ai for the clinical research department**

Many top clinical research performing organizations, generally known as the CROs have started using AI for performing clinical research. The clinical research is done to check the safety and efficacy of a particular drug. In clinical research the chances of success are less. There are many reasons for failure of clinical research process, from this reason choosing unsuitable patients is a major one. By the help of AI this problem can be solved. AI will help to select appropriate patients for performing trials based upon their age and genetic factors. AI can be also useful for monitoring patients until the completion of trials.

**Current Challenges / Future aspect in pharma field**

At the present time, many big pharma companies started investing on artificial intelligence. In the year 2012 march, Merk partnership with numerate to develop novel drug for the CVS disease. Similarly in the year 2016 Pfizer and IBM made partnership to develop drug discovery in immune oncology. Nowadays every top multinational company like Sun pharma, Dr. Reddy laboratories are heavily interested to invest in AI. So, from the future perspective view the scope of AI is bright and it seems that it will be heavily used in the pharmaceutical industry in the upcoming years.

**Robotics**

Robotics is an important part of artificial intelligence, which deals with the study of preparing brilliant as well as systematic robots. Robotics have a great use in current and upcoming generation. Robotics provide another boost to our advanced technology. The basic goal of the robotics to handle the objects by perceiving, picking, moving, modifying the physical properties of object. Robots are equipped with locomotion system, which makes robots movable. There are various components of AI robots as given in below figure.

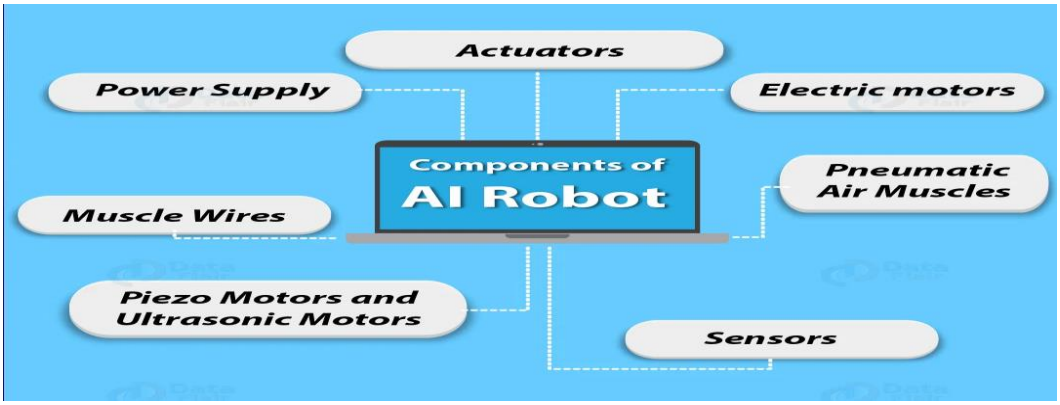


**Figure 1: Showing components of AI robot.**

(This picture or figure has been taken as a reference from https://dzone.com/articles/ai-robot-robotics-and-artificial-intelligence)

1. **Power supply:** Artificial Intelligence robots have batteries, hydraulic and solar power for the supply of power.
2. **Actuators:** Actuators are used for converting energy into movement.
3. **Electric motors:** In AI robots, electric motors are used for the rotational movement.
4. **Pneumatic air muscle:** Pneumatic air muscle is an important component of AI robot. It is useful because when the air is inside it contracts almost 40%.
5. **Muscle wire:** When the electric current is passed through muscle wire it contracts.
6. **Piezo Motors and Ultrasonic Motors:** Basically, these motors are used for the robots which are meant for the industry.
7. **Sensors:** Sensors have a great use because they provide accurate real time information.

**Applications of robotics in pharma or healthcare sector**

- Robots can work much faster than humans in the life science and pharma laboratory.
- They are used in the packaging of various medical devices.
- They are also used in preparation of prescriptions for mail-order pharmacies or hospitals.
- They are also used in hospitals to mix harmful cancer drugs and those which are associated with radiation.
- They have the capacity to carry huge number of clinical tests simultaneously.
- They can do various work in least time and without taking any break.

## CONCLUSION

If we say, Technology is like a boon for us, it will be not wrong. These latest technology like Artificial Intelligence & Robotics has made our work more effective by reducing the margin

of error. These technologies have made a revolution in our modern era of technology. However, there are some problems. Many people assuming that this technology will be risky, according to them it will be risky because it will overtake human beings then it will create problems for human. However, the day-to-day development has made these technologies more advanced. Therefore, we can say these are the great technology, but each technology should be used within limit otherwise it can cause harm to us.

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