



# RESEARCH PAPER ON ARTIFICIAL INTELLIGENCE AND ITS ROLE IN CURRENT WORLD

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## ABSTRACT:-

Today, Artificial Intelligence plays an important role in our day-to-day life. Whether it is language translator on internet or a virtual assistant offering voice searching, voice commands and voice-activated device control Ai is being used. It has made several of our complex tasks easier, and it is widely today used as a problem-solving. The Foundation of AI was set up in earlier times with the invention of humanoid automata by different craftsman which includes Yan Shi, Al- Jazari, Pierre Jaquet-Droz and Wolfgang von Kempelen. Among them most popular one were made by Al-Jazari including a humanoid automata serving drinks, water and tea and other one being hand washing automation machine having flush mechanism which is now incorporated in modern flush machines. Also, Wolfgang von Kempelen a Hungarian author and also inventor developed The Turk which was a chess playing automata, but then this machine turned out to be a hoax creating illusion in the mind of another player. This machine simulated mechanical automation. Also, he developed a speaking machine based on automation. This machine was hand operated. All these inventions lead to the development of Ai and now lot of technologies are based on Ai. Our Future will depend on Ai and other techniques based on Ai.

## DEFINITION OF ARTIFICIAL INTELLIGENCE:-

In Simple words, Artificial Intelligence means any machine like digital computer, Robot which is controlled by a computer like device to mimic human intelligence and impart knowledge like human beings. The systems which are developed with the use of Ai have the ability to generalize, learn from past and experience, reason and find logic and discover meaning. Usually these tasks can be performed with human intelligence as humans have all the abilities mentioned above. But if we make machines as intelligent as human beings, then that task can be performed within a short span of time.

There are three main aspects related to the intelligence:-

1. Intelligence is defined as the ability to obtain and then applying Knowledge.
2. Knowledge is defined as the information which is acquired through experience.
3. Experience is defined as the Knowledge which is gained through training and exposure.

So, Artificial Intelligence is defined as mimicking or copying human beings which is natural and that natural thing is capable of obtaining and then applying the information which it has gained through training.

## **DEVELOPMENT OF ARTIFICIAL INTELLIGENCE:-**

### **The Initial years (1943-1952):-**

In 1943, renowned and well known American neurophysiologist and Cybernetician, Warren McCulloch and logician Walter Pitts published a paper on the first mathematical model of a neural network, and they proposed an Artificial neuron model.

In the year 1949, Donald Hebb updated the rule and modified the connection strength between neurons, known as Hebbian learning.

But in the year 1950, Alan Turing published a paper. The paper recommended a test which can examine ability of machine to manifest intelligent behaviour which is on par with human intelligence called as Turing test. Through this test, one can determine whether a computer is able to think like a human being. In this test there are three terminals or partitions, all are separated from each other. Two terminals are under human control and one is under control of a computer. One human asks questions and other human and computer are acting as respondents. Here, the questioner or interviewer's job is to determine which is Ai and which is not.

### **Coining the Term Artificial Intelligence (1952-1956):-**

In year 1955, first artificial intelligence program was developed by Allen Newell and Herbert A. Simon named as "Logic Theorist". It was able to prove 38 of 52 mathematics theorems.

The term artificial intelligence was introduced first by American Computer Scientist John McCarthy in 1956. It was the first Ai Conference held ever.

### **The Golden Years Of Artificial Intelligence (1956-1974):-**

In year 1966, Joseph Weizenbaum developed and created first chatbot or chatterbot. This program created an illusion in the mind of users that they are having a chat with a real human being, but in reality they are having a conversation with an Ai program. This program was named as ELIZA. It was initially developed as a therapist who would talk and ask questions and then respond and continue with follow-ups.

This program worked by identifying important and keywords or phrases from the input that is given and produce response using those keywords from already existing programmed instances. For example- If a human being asks questions that "Multiply 3567894789 with 57638924568" then ELIZA would respond by asking a question that then ELIZA would respond by giving incorrect answer. Hence, the person thinks he is communicating with a real person rather than communicating with a machine because a human being cannot do such big calculation in such a short period of time.. This program was created by Joseph while keeping the Alan Turing's Turing Test in mind. This paved a way for creating more chatbots. Also, this program was able to pass the Turing test as it was unable to understand some symbols and thus was able to manipulate those symbols.

In the year 1957, Frank Rosenblatt, an American Psychologist pioneer in the field of Ai, built Mark 1 Perceptron. It is the first and one of its kind computer based on the concept of neural network, which comes under Ai. Perceptron is considered as an improvement over the McCulloch Pitts artificial neuron model, as the

previous would only accept Boolean values, whereas Perceptron accepts all real values. A multi-layer perceptron is called as neural network.

Also, Rosenblatt is called as Father of Deep Learning as he is credited with developing all the basic ingredients associated with deep learning like creation of perceptron.

Moreover, in year 1972, the first humanoid intelligent robot was built under Ichiro Kato at Tokyo's Waseda University. The Robot was named as Wabot-I. This Robot was able to communicate in Japanese with a person, and it could measure distances and directions to the objects using the artificial ears and eyes and external receptors and an artificial opening in the form of mouth.

### **Ai Winter I (1974-1980):-**

This was the dark period in the history of Ai. During this period government stopped funding to the researches of Ai and there was a severe shortage of funds.

This time-period dealt with less interest of publicity in the field of Ai.

### **Boom in the field of Ai (1980-1987):-**

In the year 1980, Artificial Intelligence revived again with the development of Expert system. Expert system work same as a human expert will work and are programmed and designed to perform high-level tasks. They mimic and imitate decision-making ability of a human expert.

Also in the same year, the First National conference of American Association of Artificial Intelligence was held at Stanford University.

### **Ai Winter II (1987-1993):-**

Again during the year 1987-1993 government stopped giving funds for researches of Ai. The reason was high cost involved and no efficient and fruitful result obtained from this. The expert system like XCON were very cost-efficient.

### **Development and Emergence of Intelligent Agents (1993-2011):-**

- **Year 1997-** In 1997, an Ai program called as Deep Blue was able to beat world chess champion Gary Kasparov of Russia, and became the first machine and computer to beat a world chess champion. This super computer was designed by IBM, and it had the capability to move twice as many moves per second it had earlier when it lost its first match.
- **Year 2002-** In this year Ai came into the households in the room of people in the form of a daily use device, Vacuum Cleaner called as Roomba.
- **Year 2006-** Now Ai was incorporated into business world and tech companies. Companies like Facebook (initial stage), Streaming platforms like Netflix started using Ai for giving recommendations, chatbots and bombarding us with posts in our feeds.

Also, intelligent agents were widely accepted by the companies and tech giants are regarded them as future of Ai. Intelligent Agent is defined as anything which takes a close look at its environment and then takes actions independently on its own to achieve certain goals and also to improve its performance through learning or just by using knowledge.

## Artificial Intelligence trends which are impacting today's society:-

### ➤ Involving ethics in Ai:-

Major tech giants or Big Five companies like Google, Meta, Apple, Microsoft and Amazon are now developing ethical Ai which will follow a structured and ethical framework. This will have four basic principles through which they will govern the data – Explain ability, Accountability, Transparency and fairness. This is the future of Ai and nowadays most popular trend in Ai.

### ➤ Developing Emotional Intelligence in Ai:-

Artificial Intelligence is used for sensing emotions, learning, communicating and interacting with other human beings using many human emotions. Nowadays chat bots and advanced technology cameras can sense human emotions with the help of studying reactions linked to products and certain services. Also Ai can detect consumer behaviour through audio and visual medium.

### ➤ Using Ai in field of Cyber security:-

Artificial Intelligence can be amalgamated with cyber security to create advanced and powerful defence. This amalgamation and integration will help in fighting against cyber-attacks like ransom ware, phishing, cross-side scripting, SQL injections, Virus etc. which cause potential threat to the device. Ai is helpful in detecting and identifying any unusual activity on the device and the system and then sending alert. Ai is useful in activity monitoring and code analysis.

### ➤ Computer vision:-

This is the most trending and hot topic which has been getting a lot of attention from tech companies and organizations. Research in the field of computer vision is gradually picking pace from the past years. Through computer vision we can transform existing computer systems into computers which are smart. These can analyse posture and movements of human beings. Basically we are getting information which is meaningful, logical and reasonable through images, videos and other visual medium. An example of application of computer vision can be facial detection for high security zones as through the help of computer vision and ml now whole features of face can be detected and recorded and kept in database in the form of facial model and sometimes 3d head pose model. Other examples are diagnosis of medical conditions both chronic and acute using data obtained with the help of data imaging and then use it for further purposes like lab testing and evaluation of new conditions and in research part also.

### ➤ Use of Ai in It sector:-

Artificial Intelligence has a great significance in It sector. Uses of Ai in IT sector are:-

1. Protecting the confidential and secret data.
2. Providing security against potential data breaches.
3. Aiding in efficient coding for programmers.
4. Maintaining the product quality.
5. Solving complex problems which are way too difficult and time consuming.
6. Detecting Software bugs and removing them.

### ➤ Use of Ai in the field of Iot (Internet of things):-

Ai has a great scope and future if it is used with Iot. We can integrate Ai with Iot to make smart devices like smart watches, Ai-powered voice assistants like Alexa, Siri and Google Assistant, Refrigerators, Air –Conditioner to study and analyse data so that these can take decisions and work

more efficiently with the help of data which is collected with no means of interference of external entity like human beings. Ai enhances and improves performance of these devices. System is also upgraded with the help of Ai and more features are added as well as enhanced with improvement in algorithms.

### ➤ **Removing Bias in Machine Learning:-**

Today, in every field use of Ai algorithms is prevalent. These algorithms are being utilised in business sector also. Hence there is a discussion going on whether these algorithms are inflicting bias towards issues like sexism and racism. Hence it is the responsibility of organizations in removing these bias by correcting the input data and values and adjusting them.

### ● **Artificial Intelligence market segmentation and share in India:-**

India is a vast and diverse country with a population of over billion people. Hence languages and dialects of people are also diverse and constantly changing per 10 km. Hence it creates challenge and becomes difficult for companies and organizations to conduct their business. Customer service is a field where Ai is used extensively in India in the form of chat bots. Today Ai is deployed in Business to Business (B2B), Business to Customer (B2C) and Customer to Customer (C2C) business channels. Many companies and sectors are adopting Ai nowadays from Banking, Infrastructure, Finance and Services sector. Ai is adopted in non- technological backgrounds in the functional roles.

### ● **Market Size Of Artificial Intelligence in India:-**

Analytics India Magazine (Aim) conducted a research with TAPMI and on the basis of their findings it showed the following results and some key highlights are:-

- 1) The market size of Artificial Intelligence in India is at a staggering value of \$7.8 billion
- 2) From year 2020, there is an increase of 22% in market size.
- 3) Main market of Ai in India is It sector with 35% share and then comes technology sector (which includes Software and Hardware sector) has 23.3% share.
- 4) Banking, Finance, Infrastructure and Services sector or BFSI sector has 9.6% market share.
- 5) About 109000 people are currently working in Ai enterprises. There is a 20% jump from previous year.
- 6) There are 14500 vacancies related to Ai in India.
- 7) The average salary of Ai professionals is INR 14.3 lakhs i.e. 1.43 million.
- 8) Mumbai has highest average salary for professionals working in Ai sector which is 17.3 lakhs, then comes Bengaluru with 15 lakh and Delhi NCR with 13.9 lakhs average salary.
- 9) After this Pune and Hyderabad comes with 13.2 lakhs and 12.6 lakhs salary.

### ● **Companies In Artificial Intelligence sector:-**

- There are MNC It Firms like Capgemini, Accenture, IBM, Cognizant .These companies provide It services to local as well as International clients.
- Electronics companies like Samsung, LG, Panasonic, Intel, Nvidia, AMD, Qualcomm and others are developing and deploying Ai technologies into their chips, Processing units, data centres, servers and memory devices.
- a) Big tech companies like Google, Microsoft, Oracle, Amazon AWS ,SAP are also prioritising Ai and have their Ai operations in India.
- Hardware technology companies are also using Ai in their building equipment.

### ● **Future projections of Ai market in India:-**

- I. Artificial Intelligence market is going to expand and value at 9.8 Billion \$ in near future.

- II. The compound annual growth rate for Artificial Intelligence market will be 27.5% and Ai market size will be \$23 billion by 2026.
- III. The growth rate is 9% higher than previous year.

### **Conclusion:-**

There has been a significant and substantial growth in the field of Ai all over the world. With more and more industries going for automation use of Artificial intelligence is bound to increase in the near future. More the new algorithms will develop and significant improvements are made in existing algorithms more Ai will be adopted by small sector industries and organizations. Also there are now many offerings for automation to clients all over the world over the cloud services. Thus, the job opportunities and revenue generation will also increase in the rate in which automation is taking place around the world. Use of Computer vision, Natural Language Processing, Robotics and Deep Learning will be predominant across the globe. Also this can very lead to a dystopian future where everything will be controlled by Ai, regulated under Algorithms .Human beings will be replaced by machines as we have seen in the movie Terminator where an automated robot was sent as an assassin. So the focus in the future should be more on how to use Ai and algorithms for problem solving, making complex task easy rather than automating everything.

### **Declaration of Completing Interest:-**

All authors are students of Lovely Professional University, Jalandhar (Punjab), India.

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