

Artificial Intelligence

[UPSC Notes]

What is Artificial Intelligence?

- It is a branch of computer science that aims to create computers or machines with human intelligence. Artificial Intelligence refers to the ability of the machine to have human intelligence processes like learning, thinking, decision making, and problem-solving.
- Artificial Intelligence includes technologies like pattern recognition, machine learning, neural networks, big data, self algorithms, etc. AI is a complex technology that involves feeding a particular data into the machine and making it react as per various situations. AI is about creating self-learning patterns that would help the machines to find out answers to the question like a human would do.
- Artificial Intelligence was first introduced in 1956 by Jon McCarthy at the Dartmouth conference, Massachusetts Institute of Technology. Recently Artificial Intelligence has gained prominence due to its various applications ranging from the military to the healthcare field.

Artificial Intelligence in India UPSC Latest News

- RAISE 2020, a huge event on AI was conducted in October 2020 in virtual mode.
- RAISE 2020 stands for Responsible AI for Social Empowerment 2020. It was organized jointly by the Ministry of Electronics and Information Technology and NITI Aayog.
- In this event representatives from the global AI Industry took part and shared their ideas on how AI can be harnessed to boost India's vision, and social transformation, empowerment, and inclusion. In this event, the selected Startups got an opportunity to showcase their Artificial Intelligence solution.

Artificial Intelligence in India Notes

According to Industry analysts that by 2035 the Artificial Intelligence market can add up to \$957 billion to India's economy. The government and private organizations have already started many programs and initiatives to strengthen the AI section in India, which would add to the country's economic and social progress.

- The Indian Government launched the National AI Portal of India in May 2020, which is a one-stop digital platform for AI-related developments in the country. This portal also acts like a knowledge-sharing tool that features documents, articles, etc for the use of stakeholders. Furthermore, it acts as a platform for getting information about AI jobs.

- The government also launched the Responsible AI for Youth Programme. The aim of this program is to give the young students a platform to enhance the new-age tech mindset in students, and AI skill-sets and make them ready for the future.
 - Under this program, the selected students from state and central government schools from all over the country will get an opportunity to attend online training sessions on Artificial Intelligence.
 - Students will have to submit their solutions through videos, and after the submission, they will get relevant training and handholding to increase their ideas to fruition for showcase on particular platforms.
- **GPAI- Global Partnership on Artificial Intelligence**
 - One of the biggest steps toward the AI revolution in India was India's participation in GPAI. In June 2020 India became a part of the Global Partnership on Artificial Intelligence.
 - GPAI is a multi-stakeholder international initiative to guide the responsible development and use of AI, inclusion diversity, grounded in human rights, economic growth, and innovation. The motive of this group is to decrease the gap between the theory and practice of AI.
- **AI for All- India's Artificial Intelligence Strategy**
 - It aims to build AI solutions with the intent to make India the AI Garage of the world.
 - It highlights the development through the use of Artificial Intelligence technologies and makes India a trusted nation that the world would depend on for AI-related work.
- **CBSE-** Central Board of Secondary Education has introduced Artificial Intelligence into the curriculum from 2020 onwards.

Challenges with Artificial Intelligence in India

- Lack of skills and talent to establish and deploy AI systems. According to a research- only 4% of AI professionals in India have prior experience in deep learning and neural networks. Additionally, there are not many Ph.D. scholars in the field.
- There is a lack of collaboration between the stakeholders. Additionally, there is a big concern that is security or privacy of data.
- It is not easy for beginners to offer customized solutions that can compete with big market players such as Facebook or Google. This problem is creating a huge entry issue for the startups in India.
- Lack of availability and high cost of the computing infrastructure required for training, development, and deployment of the AI-based services.
- Another big problem is the lack of awareness in resolving the business-related problem in most private and government agencies. This problem has led to the scarcity of AI professionals which is obstructing the growth of Artificial Intelligence in India.

Artificial Intelligence on Global Developments

Applied AI contributes largely to the economic and social development in all countries of the world. It is expected that AI would become the biggest thing in the coming days, and it would control most of the applications that require human intelligence. Many countries have started investing heavily in Artificial Intelligence. In some countries there are dedicated public officers such as the Ministry of AI (UAE) and Officer of AI and AI council (U.K). Artificial Intelligence has proven to add benefits in a wide range of sectors globally and is expected to be a key weapon for various firms. Following are the application of AI in various fields.

- **Healthcare-** some of the highly emerging AI applications in healthcare sections are personalized treatment, AI-driven diagnostics, imaging diagnostics, and identification of potential pandemics.
- **Agriculture-** AI also plays a vital role in driving the food revolution. AI addresses many challenges like excess pesticides use, inadequate demand prediction, and lack of assured irrigation. AI has the potential to enhance crop production, detect pest attacks, predication crop prices, and real-time advisory.
- **Retail-** In the retail sector, Artificial Intelligence offers image-based searches, personalized suggestions, and preference-based browsing. It improves inventory management, and delivery management, and anticipates the customer's demand.
- **Transportation-** AI applications in the transportation section include traffic management, delivery management, and monitoring and maintaining the predictive engine.
- **Manufacturing-** in the manufacturing sector, Artificial Intelligence impacts supply chain management, maintenance, production, in-plant logistics, quality assurance, and warehousing.
- **Smart cities-** in developing cities Artificial Intelligence helps in meeting the demands of a rapidly growing population and enhances the quality of life. Better crowd management, traffic control, and reducing congestion are some of the potential uses of AI.
- **Energy-** The use of AI is also included in the forecasting and modeling of the energy system to reduce unpredictability. AI in the energy sector focuses on increasing power efficiency and strengthening renewable energy systems. The AI smart meter in intelligent grids improves the reliability and affordability of solar energy.
- **Education and Skilling-** in recent years the introduction of AI has played a vital role in the education sector of India by providing solutions for a better learning experience through automating, personalized learning, easing administrative tasks, etc.
- **Financial-** It can be introduced to apps for personal finance and can collect private information and provide financial advice. For instance, 'Wall Street' software is more trading than humans.
- **Gaming-** In strategic games like chess, poker, tic-tac-toe, etc. AI plays a key role, where the machine can consider a big amount of feasible positions based on trial-and-error understanding.
- **Legal-** By decreasing the time spent during analysis, automation can lead to quicker resolution of already pending instances, thereby improving the use of time and effectiveness.
- **Intelligence-** Automation is the method of automatically operating a system or process. Robots can be programmed to conduct large, repeatable duties usually performed by people and, due to their agility and adaptability to altering conditions, different from IT automatics. Robots can carry out the tasks of a human being because of sensors that can detect physical data such as light, heat, temperature, motion, sound, bumps, and pressure from the real world. In addition, they display intelligence with effective

processors, numerous sensors, and an enormous memory. They can learn from their errors and hence, can adapt to the new environment.

- **Security-** At the 20th e-governance conference in India, it was discussed that cybersecurity can be increased by AI and it has to be explored.
- **Speech recognition-** There are smart systems that can hear and understand the language in terms of terms and meanings while people talk to it. It is capable of handling various accents, slang words, background sounds, human noise shifts owing to cold, etc.

Global Status on AI Adoption

- UK and China expect that 10% and 26% of their GDPs respectively will be sourced from AI-related business and activities by the end of 2030.
- To build larger ecosystems for AI development, infrastructural supply-side initiatives have been planned by various countries.
- Countries are preparing for the Artificial Intelligence wave, and they are creating a workforce for it. They are increasing their allocation of resources for technology, science, maths, and engineering. They are also launching schemes to train people.

Limitations of Artificial Intelligence

- Against Human Labor
 - The advent of machinery and intelligent robots in the manufacturing and services industries is decreasing employment opportunities for Humans which is a serious issue for countries like India where employment generation is a major challenge.
 - For instance, certain customs officials now are robots in China, and Japanese robots are becoming more and more evolving.
- Existential risk
 - "The growth of complete artificial intelligence might mark the end of humankind," Stephen Hawkins once said.
 - When human beings create artificial intelligence, they will disengage themselves and redesign themselves at an ever-growing pace.
 - People who are constrained by slow biological development cannot compete and would be replaced.
 - AI techniques that fall into terrorist hands could unleash the contemporary terrorist network including machines that could be detrimental to the very existence of mankind.
 - It may decrease human relationships with human beings, thereby, degrading society morally.

Way Forward to Harness the Power of Artificial Intelligence

India has the opportunity to establish itself highly in among the AI-Powered nations globally. We have pointed out a few things that would help to strengthen the AI structure in India.

Research in AI

Both core and applied research help the commercialization and utilization of any emerging technology. To build an AI strategy in India, a high amount of dedication and effort is required.

Be Ready for AI Wave

AI wave will come sooner than it is predicted, and India has to be ready for it to take full advantage. Even though India seems well-positioned to take advantage of the AI systems through its youth potential and advanced IT sector, the advantage can change quickly as there is a lack of availability of qualified faculty and researchers. To make the best out of the AI wave in the future government need to take the right initiatives and make AI development a national priority.

Fast Adoption

The data indicates that only 22% of Indian firms use Artificial Intelligence in their business process. It shows that the adoption of AI has been slow. The government needs to take steps toward AI promotion or India will lose its position on the global AI map.

Privacy, Ethics, Security, and AI

There is no doubt that Artificial Intelligence is going to be the tipping point of technological evolution. Dependency on algorithms and machines for decision-making has never been profound. However with this dependency there comes the threat to one's privacy, and security. That is why appropriate steps to minimize these risks must be considered.

Dark web and AI relation

The dark web is an anonymous, password-protected site where the criminal marketplaces thrive in advertising and selling drugs, weapons, and trafficked persons. Many law enforcement agencies work hard to stop these activities but they face tremendous challenges in investigating and prosecuting the real-world people behind the dark web. But the advancement of technology and the emergence of Artificial Intelligence have made it possible to crack down on cybercrime.