Study of Artificial Intelligence and deep learning in Digital India

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Abstract:

Recent advances in artificial intelligence (AI) are a wake-up call to policymakers in India, with every one of Prime Minister Narendra Modi's flagship programs likely to be directly affected within the next few years. With China making rapid progress in AI-based research, it is imperative that India view AI as a critical element of national security strategy. Spurring AI-based innovation and establishing AI-ready infrastructure are thus necessary to prepare India's jobs and skills markets for an AI-based future and to secure its strategic interests.

India has a large demographic of young population trained in Information Technology. However, the overall condition of the country in terms of digitization and technical infrastructure has not achieved its full potential. Most processes are still not digitized, and if they are, it is less than appropriate. The demographic dividend however can be used to the advantage of the country and digitization of processes. Seeing this potential, the Indian Union government doubled the Budget dedicated to AI for 2018, and has started promoting its development.

Key-Words: AI, IoT

## Introduction:

The Challenges Facing India's AI Development

• AI-based applications to date have been driven largely by the private sector and have been focused primarily in consumer goods. The emergent scale and implications of the technology make it imperative for policymakers in government to take notice.

• Early lessons of AI success in the United States, China, South Korea, and elsewhere offer public and private funding models for AI research that India should consider.

• The sequential system of education and work is outdated in today's economic environment as the nature of jobs shifts rapidly and skills become valuable and obsolete in a matter of years.

Artificial Intelligence:

Artificial Intelligence is the empowerment of machines to make decisions like human beings, using learning algorithms. Machines and Bots replicate human behavior by studying the environment, in order to develop decision making abilities like human beings, and to have humanoid movements.

Artificial Intelligence is already being used widely, and the future is going to use AI even more extensively.
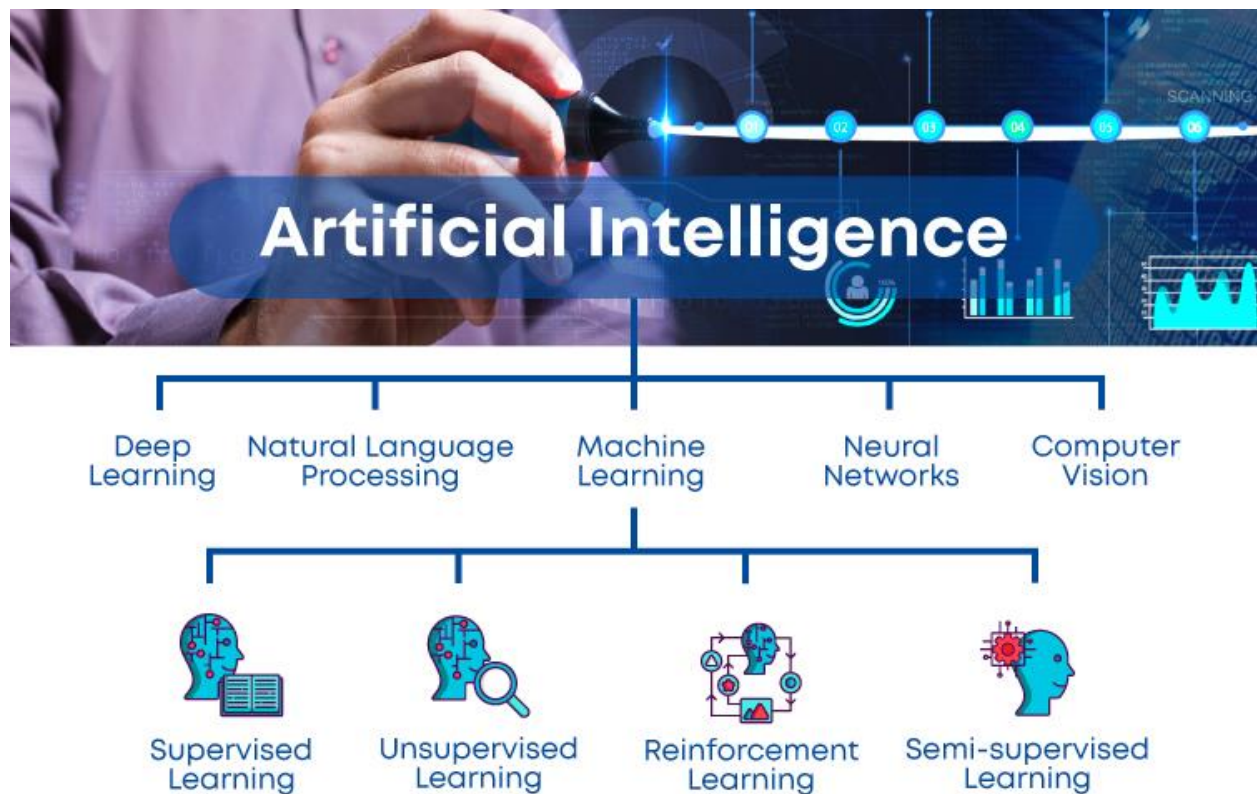
WHAT AI CAN DO?

AI has immense potential to ease and enrich human life. It can eliminate the need of human involvement in tasks that pose threat to their life and safety. One of the most high risk situation

in Defense, Reconnaissance missions, would need not use human actors anymore soon enough, when we develop sufficiently intelligent Autonomous Drones. Something as simple as a Google search employs Artificial Intelligence algorithms, to bring personalized search results to users. Autonomous Weapons and Autonomous Drones are being researched globally, to reduce risks to human lives in Defense and Reconnaissance.

Artificial Intelligence techniques can be used in a variety of sectors, to help problems persisting in our country, from transport, education to healthcare and defense. For example, two of our country's biggest challenges – Agriculture and Healthcare in remote areas can be resolved using AI.

- Using AI to analyze data from Weather and Imaging Satellites, farmers can be given insights on optimal farming practices: Best crops to farm, appropriate time to sow and harvest, suitability of pesticides and fertilizers. AI guided drones can help remove the Bureaucratic bottlenecks in receiving compensations in situations of damage to crops, by directly providing processed analysis & images of farm to insurance authorities.

- AI can be used in improving rural healthcare. PHCs usually lack in infrastructure and skilled staff. Using AI, they can directly get access to national and international resources of information and best practices. It can also be used to immediately create worldwide campaigns against infectious outbreaks.

- AI can use Big Data analytics to advise doctors on how to give the best treatment to patients. Personalized treatment plan can be developed by AI, using medical history data of the patient and analyzing case studies of similar cases from larger patient database.

HOW CAN AI BOOST OUR DEVELOPMENT?

With 500 Million Internet users, a number much larger than the entire population of United States, India has a goldmine of data in almost every sector, waiting to be capitalized. Using Big Data to mine this mountain of data, can give the much needed boost to Indian economy. Indian IT sector has already brought much acclaim to the country, and created a thriving economy. The large number of IT skilled youth in the country is ready to drive change. India can leverage the strength in IT to drive a new industry based on AI. We can use AI as an opportunity to become a

world leader by becoming the driver of the Fourth Industrial Revolution. PROSPECTS.

Defense is going to employ AI and Robotics to reduce human and monetary costs, and increase the situation of India's internal security. The external threats can be better managed by sophisticated surveillance and reconnaissance technology like autonomous drones. The Law Enforcement Agencies have a lot to gain from using AI techniques, in securing the Indian society and dealing with threats to safety of our citizens. Using Big Data and Analytics software, on the large database of offenders can help detect and prevent unlawful activities.
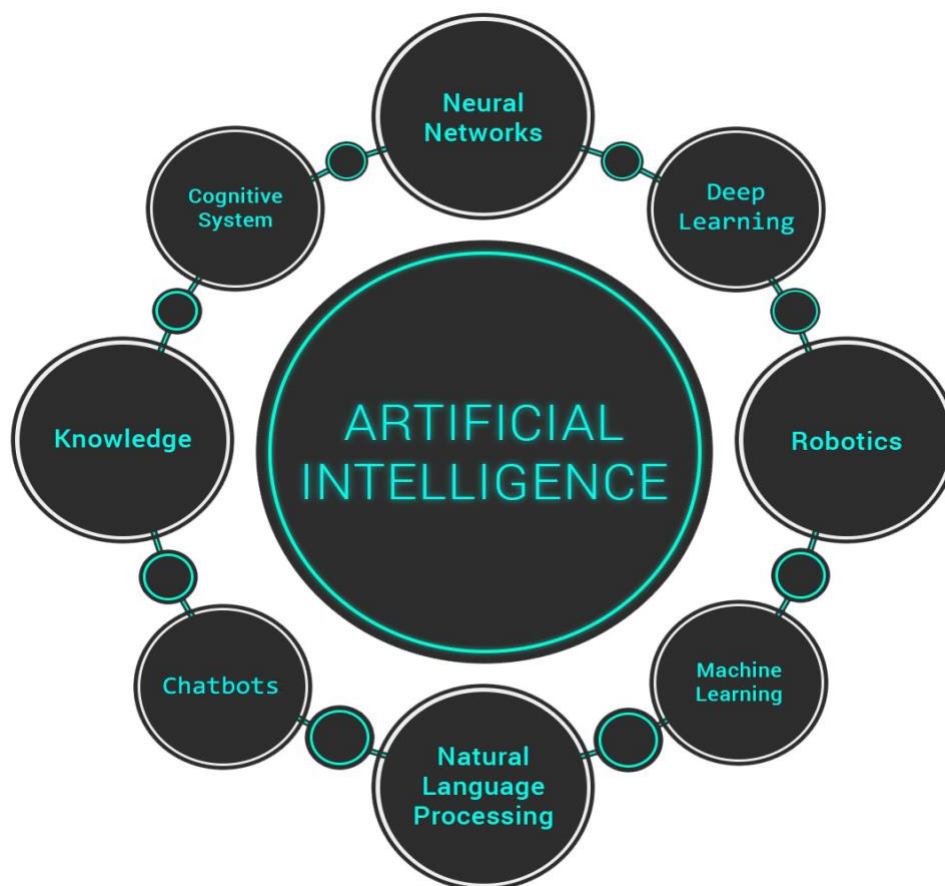
WHAT ARE THE CHALLENGES?

Like everything else in this universe, AI too has a darker side. There are many ways it can impact human society negatively and threaten human lives. The use of AI and Big Data by states for mass surveillance, can give governments unjust power over its citizens and raises questions in ethics & morality. AI may be used for malicious purposes

by hackers and terror groups, and dealing with machines would be tougher than dealing with humans, due to the elimination of human emotion and error factor. The use of bots in customer care by companies has been called out for being unethical, as the customer is uninformed about it and under the impression that they are talking to a human being. There are many unanswered questions, and a lack of policy in this regard. For instance if the bot makes a decision which leads to a criminal act or other civil/monetary losses, who would be held responsible and face consequences? Would it be the bot or the person who created it?

There are multiple ways the development of AI can go wrong. AI can fall into the wrong hands, or it can grow & learn in the wrong direction and become a negative force.

An Artificial Intelligence experiment at Facebook had to be stopped when the behavior of machines created panic. Two AI machines were made to talk to each other, and in 2 months they created a new language and were talking to each other in it, one which the creators of those machines did not understand.

It is a possibility that machines may take over human society and stop being the loyal servant that humans intended them to be. The prospect of machines becoming more intelligent than humans is frightening and dangerous.

WHAT SAFEGUARDS ARE POSSIBLE?

To make sure that things go as intended and not bring any harm to humans, policy safeguards must be ensured. Isaac Asimov's Laws of Robotics can be helpful in deciding the policies for regulating the development of Artificially Intelligent Machines.

LAWS OF ROBOTICS:

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.

2. A robot must obey orders given it by human beings except where such orders would conflict with the First Law.

3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

It must be made sure, that the learning by machines is in the right direction. Apart from intelligence some emotional feedback must also be instilled in them. They must be made to learn human ethics and accepted morality, in so far as the machine-human interaction is concerned.

Artificial Intelligence is Accelerating Digital Transformation in India:

As organizations continue to adapt to the impact of the pandemic, a large part of Indian consumers have embraced digital technologies. India remains one of the largest growing markets for digital consumers and companies are trying to acclimatize quickly. This is an excellent opportunity for organizations to concentrate on digital transformation by recognizing its necessities and roadblocks. With the prospect of automating systems and workflows in organisational setups as well as delivering individualized value to customer, benefits of the digital era are endless. There are many advantages of coupling digitization efforts with the AI capabilities – one should look at exponential technologies like AI and ML as enablers, adding fuel to the digital transformation journey. AI enables better use of data collected by companies, providing data-driven customer insights, increased agility, efficient operations and predicting uncertainties, it makes the digital experience "intelligent". The catapult effect of digital transformation projects in India are driven by a few key factors. The government is playing a proactive role in creating a digitally empowered society. 'Digital India' is the government's flagship program, aimed at reducing the digital divide in the country. Massive investments in AI and Quantum technology have further boosted the digital economy. Another key enabler is the consumer, with a very large digital consumer base. There is a high receptiveness to digital solutions across the population, this provides unique opportunities for companies to capture, create and deliver value from data. In further support, the emergence of new digital ecosystems and private-sector innovation has brought AI-enabled services to a larger consumer base. It has

created substantial opportunities in vital sectors of healthcare, banking, and manufacturing. Digital transformation is helping healthcare providers take a patient-focused approach, in turn helping streamline operations, build trust and offer a better experience. Moreover, AI is aiding digital transformation in healthcare by reducing medical errors using deep learning in object detection and recognition. Banking and financial services companies are spearheading digital transformation and quickly adapting to the new normal. Real-time capturing and recording of customer touchpoints including messages help companies to dynamically map the interactions of banks with customers. AI is being utilized to detect unauthorized access to accounts. Banks are driving cost optimization efforts by utilizing predictive analytics and reaching the right customers. In manufacturing, plants are transforming into more autonomous factories with very few people required on-site. AI models and IoT are helping manufacturing plants to suggest best course of action for workers, establish preventive maintenance programs with real-time monitoring and generate behavior models for risk prevention. Investment in AI is helping organisations realize value faster and accelerate their digital journey, but also comes with some risks. As businesses push to tackle long-standing and newly found AI challenges, they must ensure timely development and deployment of AI solutions. Unlike conventional SDLCs, AI projects are centered on identifying and collecting data. AI applications are only as good as the information fed to them. Finding high-quality information requires streamlining collection process and pre-processing available data. Organisations must also bridge the gap in understanding among teams working on these projects. AI implementation calls for the management to understand the opportunities and limitations of AI. With a clear understanding of the business problem, identifying quality data sources and aligning technical teams, organisations can scale to production with ease and draw actionable insights for business consumption. It is far easier for organizations to develop POCs to show value of an AI solution but productionizing the solution is a completely different ball game. It Involves leading a strategic change management exercise where traditional silos of IT, analytics and business need to be broken and a new agile construct created coupled with infrastructure up-gradations to ensure that the new infrastructure can handle the variety and volume of the data required in a sustainable way. This is where the market is evaluating and slowly making the transition to newer frameworks like MLOps which makes the productionizing of AI much smoother and easier. Today, consumers have become increasingly concerned about how companies access and

use personal information. The key to overcoming data privacy challenge is visibility and segmentation. Having a transparent and ethical AI implementation framework helps organizations build trust with all parties involved. Companies must monitor how AI algorithms use data at all stages. Being transparent about data collection policies also help relieve customer concerns over AI. Emerging technologies are rapidly flowing into businesses worldwide. It is no more a question of 'when' digital transformation will arrive but 'what' technologies are indispensable in the journey. AI will drive resurgence and its adoption will spur developers and users alike to push through challenges. As a result, the coming decade is a promising one for an AI-fueled digital future.

CONCLUSION:

Artificial Intelligence may very well be the gateway for India to the league of developed nations. India has the advantage of a large talent pool, which can drive the AI revolution and bring India the much needed position of being a world leader.

Ethics and morality have been the strong suit of Indian education system since ancient ages, thus making our country the right place for intelligent machines to take birth. It is natural to face challenges while following any trajectory and the challenges that lie in India's path to success in AI should not be a deterrent.

A complete overhaul of the education system is required, to accommodate the new needs. An ecosystem of Start-ups must be created so that the sector can sustain a fast pace. A structured system to teach Cyber-Security, Machine Learning, Data Sciences & Analytics and AI has to be developed to meet the demands. Data Sciences and analytics must be taught right from school level to college level, and in non technical courses as well.

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