India's Approach to Leadership in Artifical Intelligence Empowerd by Big Data

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Abstract— The world is growing rapidly day by day, and at the same time speed is growing the overall data size across the world, which technically termed as 'Big Data'. Apart from big data, a yet another technological revolution has been reshaping the world is 'Artificial Intelligence'. As the size of the data is growing and new grounds are being broken in analyzing its implications as well, it is becoming more meaningful and relevant for the machines to have performing their functions with the help of big data analysis. This paper represents the integrated relationship between Big Data and Artificial Intelligence.

Keywords— **Technological Revolution, Integrated Relationship** etc.

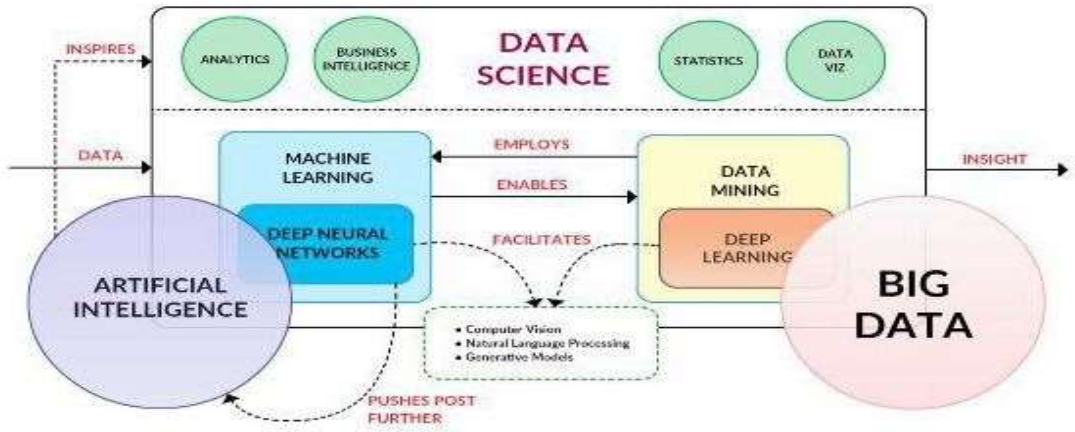
Introduction: Big Data is present everywhere and it is very important and essential to preserve the data that is generated in huge amount so something should not be left out. It is utmost difficult to store that massive amount of data any organization generates. Traditional computing techniques are not able to handle such large form of data. In this case artificial intelligence is usually used to process the data. Now a days we are developing websites, applications as well as technologies like self driving cars and robots etc. To implement these all we need learning algorithms. Web provides huge amount of data but this form of data is unstructured data. Big data extracts data from the web and used it to train the algorithms and this form of data is highly useful and with increasing amount of data we need a way to utilize this amount of data in an efficient way. The best example of this can be seen in sentiment analysis and stock market prediction. Artificial revolves around an artificially created entity performing task or thinking in an autonomous manner as similar to human beings. Big Data perform parsing and analyzing large data sets to look for trends, patterns, etc. For example, instead of humans deciding how to interpret, refine and act on big data analysis, artificial intelligence could be used instead to make these decisions. Conversely, Big Data could be used by Artificial Intelligence in its self-learning and/or decision making. Artificial Intelligence and its sub branch termed as Machine Learning or deep learning, neural networks etc are all algorithmic methods that work on huge amount of data to produce desired results out of it. This huge data needs to be stored in a particular format and most of the times this format is not SQL database, rather a much unstructured format.

How Big Data Enhancing Artificial Intelligence:

Inherently, machine learning is defined as an advanced application of Artificial Intelligence in interconnected machines and peripherals by granting them access to the databases and making them learn new things from it on their own in a programmed way. As the size of big data is continuously growing and new grounds are being broken in analyzing its implications as well, it is becoming more meaningful and contextually familiar for the machines to have a better idea of their functions with the help of big data analysis.

For example, the automation infrastructure of a leather garments plant based in Bangladesh that exports its products to the entire European market will be able to judge market requirements for the coming winter season in much accurate and insightful manner if it is able to access and analyze big data reports about the market, financial and weather conditions of that area throughout the year [1].

Figure 1: AI and BIG Data Relationship



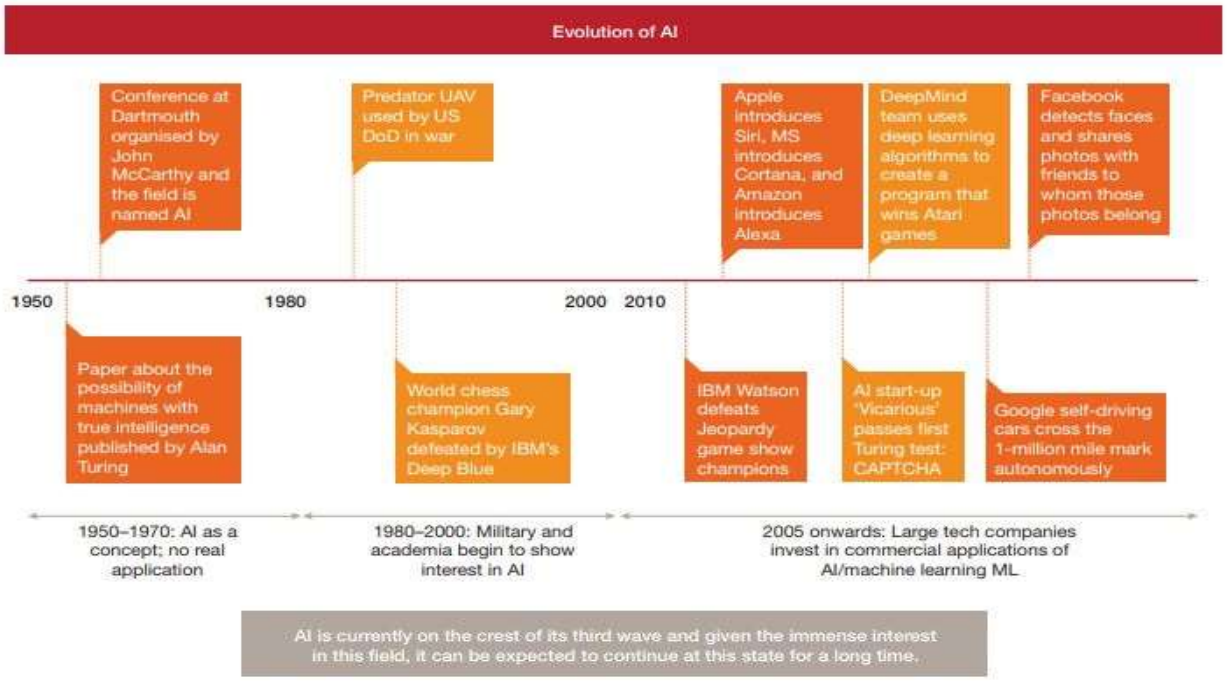
Expanding Artificial Intelligence & Machine Learning with Big Data:

One of the major concerns of the people about Artificial Intelligence now these day is that it will minimize human requirement and efforts in all the job sectors as most of the work will be done by robotics and Artificial Intelligence based computers in future, while the truth is far from it when observed with the role to be played by big data in the picture. The sentimental and emotional big data analysis will always require intelligence of human as the machines lack emotional intelligence and decision-making abilities based on sentiments. The Centre for Artificial Intelligence and Robotics a branch of Defence Research and Development Organization was established in 1986. The mission of this project is to add value to information by delivering dependable information system to the Defence services for battle space dominance by developing domain and related technologies that ensure reliability, safety, security, durability, resiliency and trustworthiness and enabling the use of these systems in mission and critical applications with required guaranties of assured performance. When machines develop the ability to perform complex tasks such as audio/video recognition and decision-making that usually require intelligence of human being, they are said to possess Artificial Intelligence. Using robotics, these machines are in fact capable of implementing those decisions without requiring any further human intervention. Clubbed with new developments in the world of technology such as Big Data, the scope and the future of Artificial intelligence has been altered and transformed significantly.

India's Approach to Leadership in Artificial Intelligence:

Advancement in Artificial Intelligence has garnered extensive interest from the private and public sectors. AI has interestingly made interfere into the daily lives of the Indians in various forms like app-based cab aggregators and digital assistants on smart phones. The interest can be identified from the fact that leading Information Technologies service outsourcing companies have begun thinking, talking and (a few) launching artificial intelligence platforms. But these are minute steps towards achieving the ultimate goal of Artificial Intelligence i.e. replacing human intelligence. The systems being developed, as of now, are improving the process of increasing the efficiency of solving a repetitive problem. This will eventually lead to solutions to numerous ever changing problems. In contrast, the start-up sector is able to directly counter these problems as it does not carry the baggage of Information Technology outsourcing firms. [2] Indian start-ups are working across a plethora of Artificial Intelligence problems— identifying patterns in various objects, human, style and preferences to advice on retail shopping; building conversational services and using them over social media applications and for online shopping; developing better diagnostic services; bringing in cognition in robotic process automation; helping in cross-channel discovery of preferences and working in multiple languages. India is currently in the midst of a surge of urbanization. While the percentage of the population living in urban areas was estimated to be 31% in 201122, recent research on satellite data indicates that this figure is close 45% today [5], and predicted to rise to up-to 60 percent by 2050. These are just a few of the areas that Indian start-ups are presently working on. Commercial applications of Artificial Intelligence are huge and Indian start-ups are beginning to identify them and tap into the market, which is still nascent.

Figure: 2 Evolution of AI (Sources Pwc analysis)



Finalization of National Artificial Intelligence Mission:

A Task Force on Artificial Intelligence (AI) for India's Economic Transformation was constituted on 24th August 2017 by the Indian Government. The Task Force submitted its report on 19th January 2018. It has recommended an Inter-Ministerial National Artificial Intelligence Mission to act as a nodal agency for coordinating the Artificial Intelligence related activities in India. Globally, digital and AI technologies are helping solve pressing issues across the agriculture value chain. The relative role of each technology in creating impact is dependent on the nature of the work, and the issues at hand. India has ~30 million farmers who own smart phones, which is expected to grow 3 times by 2020 and 315 million rural Indians will be using internet by 2017 [7].The recommendations of the Task Force have been shared with various Ministries and Departments of the Government of India [3]. In the meeting of Committee of Secretaries held on 8th February, 2018, NITI Aayog has been tasked with formulation of a National Strategy Plan for AI in consultation with Ministries and Departments concerned academia and private sector. NITI Aayog has prepared and placed on its website on 4th June 2018 a discussion paper on National Strategy on Artificial Intelligence identifying following five sectors to be focused upon: Healthcare, Agriculture, Education, Smart Cities and Infrastructure, Smart Mobility and Transportation. In order to create a policy framework and to develop the ecosystem for Artificial Intelligence, Ministry of Electronics & Information Technology has constituted four committees covering all the aspects of AI. These Committees are:

- Committee on platforms and data for AI,
- Committee on leveraging AI for identifying National Missions in key sectors,
- Committee on mapping technological capabilities, key policy enablers, skilling, re-skilling and R&D
- Committee on cyber security, safety, legal and ethical issues.

Artificial Intelligence Research in India and World:

During 1986-94 the then Department of electronics (Currently MEITY) and United Nations Development Plan launched knowledge based computer systems (KBCS) which aims to research and capacity development. From 1992 onwards developments could be seen in Language, Scripts, Fonts, Prototype Machine Aided Translation Systems as well as Speech synthesis system for blind and Screen readers. In 2012 AI placed itself in Perception engineering i.e. Gaming and vision etc. From 2015 onwards more than 300 starts ups and near about 100 organizations are reportedly working in this area. USA in 2016 released three reports "Preparing for the future of AI", Application for AI for public good, Promote High risk, high reward Research, AI for Cyber defence and fraud detection and Shared public datasets for AI. Alongside Asia's giant China has adopted action plan "Next Generation Artificial Intelligence Development Plan" July 2017 , Roadmap for 2030, ¬Applications in manufacturing, medicine, Agriculture etc. and Open-source hardware and software platforms for hybrid intelligence, autonomous unmanned system. United Kingdom ¬Spent 17 million pounds in 2017 to support AI research by the Engg & Physical Research Council (EPSRC) as well as Startups seeded at Cambridge &Oxford universities achieved major AI breakthroughs. Japan-

Investments Future Growth Strategy – Society 5.0 in AI Robotics, Big data, Internet of things, AI Research Focus Areas: Health, Self Driving Trucks and Drones and Two Research Centers proposed – US $ 214 million.

Public policy in India on the application of Artificial Intelligence has so far lagged behind when compared to AI's subtle usage by start-ups who have so seamlessly blended Artificial Intelligence into the services provided to the customers. If we look at the applications that we use/have used at some point of time (e-commerce platforms, chat services, social media services etc), they have all been indulging AI in some form and at some level of maturity or the other. Perhaps India is making progress in terms of technology, companies and researchers are yet to utilize the full potential of Artificial Intelligence. While the USA is currently in the process of implementing laws concerning driverless vehicles like self driving cars, India still lags behind in this scenario. Instead of waiting for technology to reach a level where regulatory intervention becomes somewhat necessary, India could be a frontrunner by establishing a legal infrastructure in advance and proclaimed its position. Alternatively, early public sector interest in Artificial Intelligence could trigger a spurt of activity in the AI field in India. The main issue is that the regulations will have to deal with relates to who will be liable for the activities of AI systems. These systems are designed to be creative and to continue learning from the data analyzed. Hence, the designers may not be able to understand how the system will work in the future.

India's Competitive Advantage:

Advantage in IT, India is moving towards trillion dollar digital economy by 2025, therefore in an advantageous position for quicker adoption of Artificial Intelligence. The healthcare market globally driven by AI is expected to register an explosive CAGR of 40% through [8]. Program like Digital India programme, Start-up India and Make in India are boosting confidence and gaining momentum. India has already registered its capability in IT/ITES and related sectors. In this regard India has taken some more initiatives like-

- NIC – Development Programmes - Image Processing (searching/Matching)- Microsoft Cognitive Services – Service Delivery/Service Desk - Audio Assistance to caller-Google APIs
- CDAC – Education – Health – Agriculture
- CDAC has some existing AI resources- Vehicle Actuated Traffic Signal Controller (WiTraC), Traffic Monitoring and Management Software (TraMM), Adaptive Traffic Control System (CoSiCoSt), Red light Violation Detection System (iRIDS) and Intelligent Parking Management etc [4].

Challenges and Its Implications:

NITI Ayog unveiled its discussion paper on national strategy on Artificial Intelligence which aims to guide research and development in new and emerging technologies. NITI Aayog has identified five sectors — agriculture, healthcare, education, smart cities and infrastructure and transportation — to focus its efforts towards implementation of Artificial Intelligence. NITI Ayog estimates that adopting Artificial means a 15% boost for the gross value added (GVA) for the economy by 2035. AI can increase the access and affordability of quality healthcare. In agriculture, it can contribute towards enhancing farmers' income, increase farm productivity and the reduce wastage. It can also improve access and quality of the education. It will help build efficient infrastructure for the increasing urban population. Develop smarter and safer modes of transportation to address the traffic and congestion problems. Artificial Intelligence could create jobs in the country that would be higher than the number of jobs becoming redundant due to innovation in technology. Increase efficiency and enhance governance across the government. It also helps in improving the ease of doing business, as well as making the lives of people simpler. 'Make in India' programme can be strengthened and help India in becoming a major manufacturing hub in the world with AI-assisted technology. Accenture, in its recent Artificial Intelligence research reports [9], provided a framework for evaluating economic impact of AI for select G20 countries and estimates AI to boost India's annual growth rate by 1.3 percentage points by 2035.

Conclusion:

The penetration of self-driven cars, robots and fully-automated machines, which are presently being used in various economies around the world, is only expected to increase with the passage of time. As a result, the dependency of entities and individuals on Artificial Intelligence systems is also expected to increase proportionately. This may be evidenced from the fact that Artificial Intelligence is expected to bolster economic growth by an average of 1.7% across various industries by 2035 [10]. However, in order to safeguard the development and integration of Artificial Intelligence systems with the industrial and social sector, it is important to ensure that the current concerns that exist with regard to Artificial Intelligence systems are properly addressed. Due to the lack of legal jurisprudence on this subject, it is hoped that in the near future legal and tax principles are established which will not only foster the development of Artificial Intelligence but also ensure that the necessary safeguards are in place.

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