Artificial Intelligence Supremacy

The ascendancy of Artificial Intelligence on our lives

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Abstract : Artificial intelligence (AI) is a broad tool that allows people to re imagine how we combine information, analyse data, and apply the ensuing insights to better decision making—and it is already changing every aspect of life. Authors analyse AI's use across a range of areas, address challenges in its development, and make ideas for making the most of AI while also maintaining key human values in their paper**.**

Index Terms **- Artificial intelligence (AI), decision making.**

I. INTRODUCTION

Artificial intelligence (AI) is a technology that is revolutionizing every aspect of existence. It is a versatile tool that allows individuals to reconsider how we combine information, evaluate data, and apply the ensuing insights to make better decisions. Our goal with this comprehensive review is to explain AI to a wide range of policymakers, opinion leaders, and interested observers, and to show how AI is already changing the world and posing critical concerns about society, the economy, and politics. We examine emerging applications in finance, national security, health care, criminal justice, transportation, and smart cities, as well as topics such as data access issues, algorithmic bias, AI ethics and transparency, and legal culpability for AI choices in this article. We contrast the regulatory policies of the United States and the European Union, and we conclude with a set of recommendations for making the most of AI while also preserving key human values.[1]

We offer nine actions for moving forward in order to maximize the benefits of AI -

1. Require the researcher to have more access to data without compromising consumers' personal privacy.
2. Increase government funding for unclassified AI research.
3. Encourage the creation of new types of digital education and AI workforce development so that employees have the skills required in the twenty-first-century economy.
4. Establishing a government AI advisory council to provide policy suggestions.
5. Collaborate with federal and municipal politicians to ensure that successful policies are implemented.
6. Rather than regulating particular algorithms, generic AI concepts should be regulated.
7. Address prejudice claims at face value to prevent AI from reproducing past imbalances, injustice, or bigotry in data or processes.
8. Maintain human oversight and control procedures.
9. Indict harmful AI conduct and encourage computer networks security.

II. VIRTUES OF ARTIFICIAL INTELLIGENCE

However there is no universally accepted definition, AI is typically understood to refer to "machines which response to stimulus in ways that are commensurate with conventional human responses, given the human ability for cognition, discernment, and purpose."[2] These software solutions, according to academics Shubhendu and Vijay, "draw inferences that ordinarily demand [a] human degree of skill" and assist individuals predict difficulties or deal with challenges as they arise. [3] As a result, they act in a deliberate, intelligent, and adaptable manner.

1. Intentionality - Artificial intelligence algorithms are meant to make judgments based on real-time data. They differ from passive machines, which can only respond mechanically or in a preset manner. They integrate information from many sources using sensors, digital data, or remote inputs, evaluate the material quickly, and act on the insights produced from the data. They are capable of considerable sophistication in analysis and decision - making thanks to huge increases in storage systems, computing speeds, and analytic approaches.
2. Intelligence - AI is typically used in combination with machine learning and data analytics. [4] Machine learning examines data for underlying tendencies. If it detects something related to a real problem, software designers can utilize that information to evaluate specific concerns. All that is necessary is data that is robust enough for algorithms to detect valuable patterns. Data might take the form of digital data, satellite images, visual data, text, or unstructured data.

3. Adaptability - AI systems are capable of learning and adapting as they make judgments. Semi-autonomous cars, for example, include systems that notify drivers and vehicles of impending traffic congestion, potholes, highway construction, or other potential traffic barriers. Cars may benefit from the experience of other vehicles on the road without requiring human intervention, and the entire corpus of their gained "experience" is instantly and completely transferable to other similarly designed vehicles. Their powerful algorithms, sensors, and cameras absorb expertise from current operations, and they employ dashboards and visual displays to provide information in real time so that human drivers can make sense of ongoing traffic and vehicular circumstances. In the event of fully autonomous cars, technological technologies may entirely manage the automobile or truck and make all navigational decisions.

AI isn't really a far-off concept, but rather something that is now being integrated and used in a range of industries. Finance, homeland security, medical services, criminology, infrastructure, and green infrastructure are examples of such sectors. There are countless examples of AI already having a substantial influence on the world and complementing human skills. [5] One of the reasons for AI's expanding prominence is the enormous prospects for economic development it provides. According to a PriceWaterhouseCoopers report, "artificial intelligence technology might enhance global GDP by $15.7 trillion, or 14 percent, by 2030." [6] Furthermore, a McKinsey Global Institute study of China concluded that "AI-led mechanization can offer the Chinese economy a performance boost that would add 0.8 to 1.4 percentage points to GDP growth yearly, determined by the rate of penetration." [7]

III. APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN VARIOUS SECTORS

1. **Finance** - Funding in commercial AI in the United States more than tripled between 2013 and 2014, reaching $12.2 billion. [8] "Decisions concerning loans are increasingly being made by algorithms that can take into consideration a range of finely parsed facts about a borrower, rather than just a credit score and a background check," say industry analysts. [9] Furthermore, there are robo - counselors, which "build tailored investment portfolios, obviating the need for stockbrokers and financial advisers." [10] These advancements are intended to remove emotion from investing and allow investors to make decisions based on analytical factors in a couple of minutes. A notable illustration of this is what is happening on stock markets, where high-frequency trading by robots has replaced most of human decision making. People input buy and sell orders, and computers match them without human involvement in the blink of an eye. Machines can detect trading inefficiencies or market differentials on a very tiny scale and execute profitable transactions based on investor instructions. [11] These instruments, which are powered in some locations by modern computers, have far higher capacity for storing information since their emphasis is not on a zero or a one, but on "quantum bits," which may store many values in each spot. [12] Another use of AI in financial systems is fraud detection. It can be difficult to detect fraudulent actions in huge companies, but AI can detect irregularities, outliers, or deviant situations that require further study. This assists managers in detecting issues early in the cycle, before they reach harmful proportions. [13]

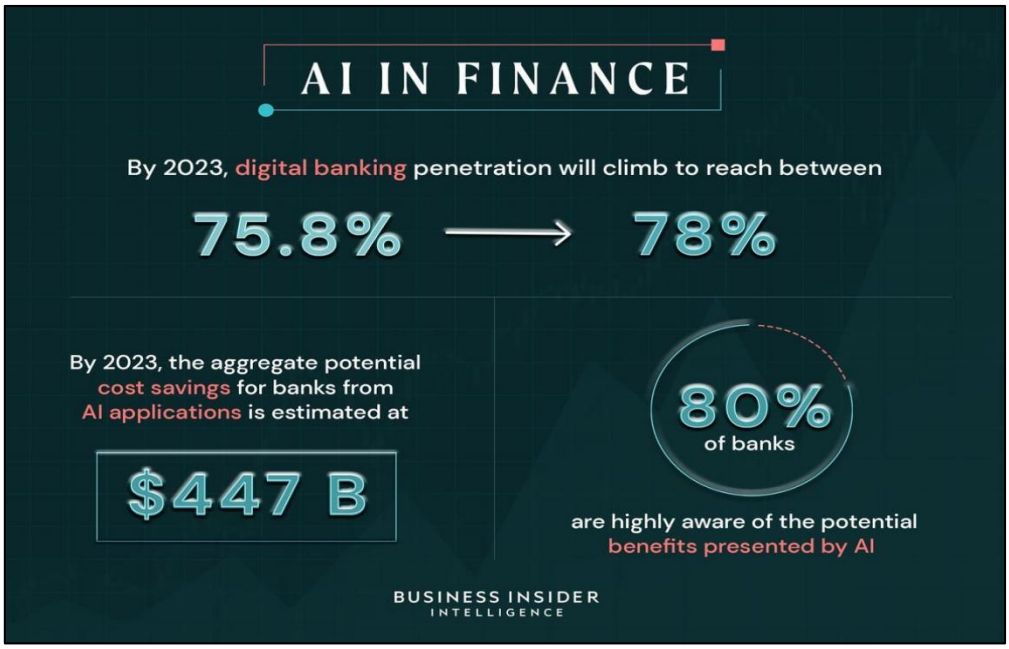

Fig1. AI revolutionizing in Finance industry [14]

2. **National Security** - India has almost no intentions to slow down the race to equip nations' military forces with advanced artificial intelligence (AI) and robotics. As a result, India has joined the United States and China in having one of the world's highest military budgets. The Ministry of Defence established a multi-stakeholder task group on the Strategic Implementation of Artificial Intelligence for National Security and Defense. While the task group will investigate various innovations in Artificial Intelligence throughout the world and how they may be used by the defence industry, the Defence Public Sector Undertakings (DPSUs) and ammunition manufacturers have been asked to develop AI-assisted goods.[15]

Fig2. Display of a robot powered by AI [16]

3. **Health care** - AI in the healthcare sector in India has the potential to grow. According to a survey issued earlier this year by the CIS India, AI might contribute USD 957 billion to the Indian economy by 2035. According to the research, at least 16 Indian Healthcare IT businesses got money from the USD 5.5 billion raised by global digital healthcare companies in the July-September 2017 quarter. State governments are also assisting AI start-ups.[17] AI has the potential to solve a variety of healthcare issues in India. Technological advancement is proving to be advantageous in diagnostic procedures, chronic disease monitoring, robotic surgery, medication development, and other areas. Microsoft, along with Apollo and other hospitals, is pursuing a huge drive to extend its usage in multiple areas such as cardiology, eye-care, illnesses such as tuberculosis and HIV, and so on. [18]
   A list of six healthcare start-ups in India that are utilizing Artificial Intelligence:

   i. Niramai, a Bengaluru-based start-up incorporated in 2016, using artificial intelligence for noninvasive breast cancer screening.
   ii. MUrgency, a healthcare mobile app developed in Mumbai, connects individuals in need of medical emergency solutions with certified healthcare, security, evacuation, and assistance specialists.
   iii. Advancells, a Noida-based start-up, offers stem cell treatment, also known as regenerative therapy, which has significant potential in the field of organ transplantation.
   iv. Portea, a Bengaluru-based start-up, provides patients with home visits from physicians, nurses, physiotherapists, and technologists. Patients who are unable to go to hospitals can obtain support from doctors and medical experts through the use of remote diagnostics and monitoring equipment, as well as point-of-care devices.
   v. AddressHealth, a Bengaluru-based start-up, offers primary paediatric healthcare services to schoolchildren, including hearing, vision, dental health, and anthropometry screenings, as well as a medical competition.
   vi. LiveHealth, a start-up established in Pune, serves as a management information system (MIS) for healthcare providers. It takes samples, keeps track of patient information, diagnoses them, and creates reports.

Artificial Intelligence, the next-gen innovative thing will act as an “invisible hand” in revolutionising the healthcare sector and is expected to grow in India to USD 372 billion by 2022.

4. **Criminal Law enforcement** - In India, artificial intelligence in law enforcement is still in its early phases. Regardless, efforts are always being made to use AI in policing in light of our country's overworked and underfunded police force. In 2019, the Gurugram-based firm Staqu[i] launched JARVIS, or Joint AI Research for Video Instances and Streams, in Uttar Pradesh. JARVIS has been evaluating CCTV film around the state since that time to provide a chain of administrations like location of brutality, interruption, pickpocketing, and other swarm research. JARVIS has proved extremely useful in prisons across Uttar Pradesh, where it is used to screen inmates for illegal activities. Aside from JARVIS, PAIS and TRINETRA are two more programmes that are increasingly being employed by Punjab and Uttar Pradesh police forces, respectively. PAIS (Police AI System) is an information base of over 35,000 offenders that is being utilised effectively to check misconduct. The Punjab Police has used this approach to deal with certain basic and high-profile incidents recently, earning it the FICCI Smart Policing Award in 2018. Meanwhile, the Delhi police are using the Innefu Lab's facial recognition programming to further build its legislation authorization tools. Furthermore, Delhi Police is employing foresight policing innovation known as the Crime Mapping, Analytics, and Predictive System (CMAPS), which breaks down past data accompanying police hotline calls to anticipate wrongdoing hotspots in the city. Another recent advancement in the industry has been the CCTV Mannequin framework, which was presented in Bangalore. These life-sized figures dressed as police officers will be on the lookout for minor criminal charges such as careless driving and violation of traffic laws. According to the Internet Freedom Foundation, as of now, 48+ face recognition frameworks are being used by experts in 19 states and association areas, with Delhi having the most of these frameworks. [19]

5. **Transportation** - India's transportation system is beleaguered by insufficient and inefficient public transit infrastructure, organized public transportation in only a few cities, and rising rates of motorization. With the expansion of projects under the National Highway Development Programme (NHDP), there have been chances for innovation in electronic toll collecting (ETC) and traffic monitoring. In the most recent five-year plan, almost $1.8 million was also devoted to intelligent transportation systems and parking. NITI Aayog and the International Road Federation, located in Geneva, have inked an agreement to collaborate in the field of Intelligent Transportation Systems and to develop a policy framework for the same. The National ITS policy will address a number of issues, including traffic management, parking management, and electronic enforcement of traffic laws and regulations. It would also involve fleet management and monitoring, as well as ITS innovation and education. India's economy is advancing, yet we continue to face challenges due to inadequate infrastructure. Optimisations based on modern AI and algorithms can benefit the transportation system by lowering fuel consumption and reducing resource time spent on the field. According to estimates, the transportation AI market would be worth $10.30 billion by 2030. One of the major issues is a lack of qualified candidates. As the sector grows increasingly data-driven and digital, so will its talent requirements. More AI experts with understanding of transportation technologies would be required. [20]

IV. AI POLICY, REGULATORY AND ETHICAL ISSUES

These examples from various industries demonstrate how AI is transforming many aspects of human life. The increasing integration of AI and autonomous devices into many aspects of life is changing basic operations and decision making within organizations, while also improving efficiency and response times. At the same time, these developments raise critical policy, regulatory, and ethical concerns. For instance, how can we encourage data access? How can we prevent prejudiced or unjust data from being exploited in algorithms? What kinds of ethical standards are introduced through software development, and how open should designers be about their decisions? What about legal ramifications in circumstances when algorithms create harm?

The increasing integration of AI into many aspects of life is altering organizational decision-making and increasing efficiency. At the same time, these advancements create critical policy, regulatory, and ethical concerns.

A "data-friendly ecosystem with consistent standards and cross-platform sharing" is essential for getting the most out of AI. AI is based on data that can be studied in real time and applied to specific challenges. Having data that is "explorable" among the research community is a need for effective AI development. Algorithms incorporate ethical and value factors into programme decisions. As a result, these systems raise concerns about the criteria utilised in automated decision making. Some people wish to have a deeper grasp of how algorithms work and what decisions are made.

There are concerns about AI systems' legal culpability. If there are any injuries or violations (or fatalities in the case of autonomous automobiles), the algorithm's operators will very certainly be held liable under product responsibility laws. A body of case law has demonstrated that the facts and circumstances of the incident establish responsibility and impact the type of sanctions imposed. For serious offenses, this might range from civil penalties to jail.

V. RECOMMENDATIONS TO OVERCOME ISSUES RELATED TO AI

We suggest a number of proposals for going forward with AI in order to reconcile innovation with fundamental human values. This includes improving data access, increasing government investment in AI, promoting AI workforce development, forming a federal advisory committee, collaborating with state and local officials to ensure effective policies are implemented, regulating broad objectives rather than specific algorithms, recognizing bias as an AI issue, maintaining mechanisms for human control and oversight, penalizing malicious behaviour, and promoting cyber security.

1) Improving data access - India should adopt a data policy that encourages innovation while also protecting consumers. There are currently no universal rules in place for data access, data exchange, or data protection. Almost all of the data is confidential in nature and is not widely shared with the research community, which inhibits innovation and system design. To test and increase its learning ability, AI requires data. It will be practically difficult to reap the full benefits of artificial intelligence without organized and unstructured data sets. Google has long made aggregated search results available to scholars and the general public. Scholars may evaluate themes like as interest in the country's PM, opinions on democracy, and thoughts on the broader economy through its "Trends" portal. This allows users to follow public interest movements and find issues that pique the public's attention. Twitter makes a large portion of its tweets available to academics via application programming interfaces, or APIs. These tools enable anyone outside the firm to create application software and utilize data from the company's social media network. They can examine social media communication patterns to discover how people are commenting on or reacting to current events. [21]

To increase system performance, public-private data partnerships that mix government and commercial data sets might be formed. To enhance mobility, communities may, for example, combine information from ride-sharing firms with their own material on social service sites, bus lines, public transit, and highway congestion. This would aid urban regions in dealing with traffic congestion and in highway and public transportation design.

2) Increase government investment in AI - India, on the other hand, would need time to catch up and be on level with its global contemporaries. Ironically, opinions of AI in the country have also contributed to the country's stalling growth. IIT's Mausam alludes to the "dark ages of AI," when it was not seen to be very vital. "Traditionally, AI researchers have been viewed as pipe dreamers who aim to create intelligent robots." However, due to decades of poor development in AI, AI researchers were seen as people who put in a lot of effort but don't provide real results. As a result, most departments had very little AI faculty," he claims. Nevertheless, in the last six years, things have changed dramatically, with the result that not only does every IIT now have multiple professors working in this subject, but there is also significantly greater recognition from non-AI researchers. According to Mausam, the comeback of neural deep learning models combined with strong technology and big annotated datasets was the true catalyst for the present AI revolution. According to industry analysts and startup owners, the number of AI-centric startups in India is still in the tens of thousands. "In India, the number of AI-based startups is in the 80s." [21]

In order for AI to thrive, India has to build a more sustainable startup ecosystem. Furthermore, Indian governments and privately held businesses must chart clear paths to drive the democratization of AI technology," believes Kushal Nahata, CEO and Co-founder of FarEye, a firm enabling digital forensics.

3) Form a federal AI advisory committee - Government policymakers must consider how they will cope with artificial intelligence. As previously stated, there are several challenges ranging from the need for greater data access to tackling bias and discrimination. These and other challenges must be addressed if we are to reap the full benefits of this developing technology. To go progress in this field, many members of Congress have sponsored the "Future of Artificial Intelligence Act," which is intended to create broad legislative and legal guidelines for AI. It recommends that the Secretary of Commerce establish a government advisory council on the research and application of artificial intelligence.

4) Punitive illegal activity while promoting cyber security - As with any evolving technology, it is critical to inhibit unwanted behaviour aimed at fooling software or using it for nefarious purposes. This is especially crucial given the dual-use nature of AI, in which the same technology may be employed for both positive and malevolent reasons. The malicious use of AI exposes individuals and organizations to unwarranted dangers while undermining the benefits of the developing technology. This involves hacking, altering algorithms, jeopardizing privacy and secrecy, and stealing identities. Attempts to hijack AI in order to get sensitive information should be severely punished in order to dissuade such behaviour. In a constantly changing world where many organizations have significant computer skills, cyber security must be given considerable consideration. Countries must exercise caution in order to protect their own systems and prevent other countries from jeopardizing their security. [21]

VI. CONCLUSION -

To conclude, artificial intelligence and data analytics are on the verge of changing numerous industries. Significant deployments have already changed decision making, business models, risk mitigation, and system performance in banking, national security, health care, criminal justice, transportation, and smart cities. These innovations are yielding significant economic and social advantages.

The world is on the verge of a technological revolution in many fields thanks to artificial intelligence, but the process by which AI systems are built has to be better understood owing to the significant ramifications these technologies will have for society as a whole.

However, the way AI systems develop has far-reaching repercussions for society as a whole. It is important to consider how policy difficulties are addressed, ethical dilemmas are resolved, legal realities are addressed, and how much openness is necessary in AI and data analytic solutions. Human decisions concerning software development influence how decisions are made and how they are integrated into organizational processes. The specifics of how these processes are carried out must be better understood since they will have a significant influence on the general population in the near future. AI might usher in a new era in human affairs, becoming the single most impact on human innovation in history.

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