

Challenges in Artificial intelligence - A Comparative analysis of policy implications in India, United States and Germany*

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ABSTRACT

When McCarthy coined the term “artificial intelligence”, he meant the basics of machine learning. The algorithms building mathematical data to allow a processor make human-like choices, and make human-like predictions without any support of human emotional intelligence or human reasoning is what is labelled as computer intelligence. However, machine learning and computer intelligence cannot be compared with human reasoning and human emotional intelligence at this level where it is still in its developing phase and which has seen encouraging development in recent past decades that seems pretty alarming sometimes that tend to have a feeling of AI being a problematic development.

In accordance with India’s legal code of jurisprudence, legal personality of AI must be determined, which shall tend to mean that AI too has a bundle of rights and liabilities. AI which is considered as autonomous working technology, has the capacity to think, and as these machines start interacting more with humans, there are possibilities of more legal issues to arise. Such as, who to be held accountable for any criminal liability arising from any fault of AI? Such questions have already been argued in the courts of some of the countries such as Germany and U.S.. Whereas, India by their example must be legally prepared and strategise to face such unpredicted technology in the coming future. There has been a start of a race across the world to develop law and strategize the further AI plan in their consecutive countries keeping in mind the advantages or the harm this technology shall possess. NITI Ayog released an artificial intelligence policy paper named ‘National Strategy for Artificial Intelligence’, which has considered the significance of AI in several different sectors in India. The Budget 2019 also intended to launch a national programme on AI. While all of these developments are happening on the technological front and are happening so fast, no absolute policy frameworks have been made at the forefront to manage this rapidly growing industry till date. The real question is, when will we draft a human made machine intelligence bill of rights? Who will get to decide that? And What rights and liabilities will that consist of? This paper discusses the ethical and legal implications, challenges of AI, its legal personality, following the strategies being made by U.S, Germany and India to tackle down the possible challenges of AI. This will also ensure that our interactions with AI are safe and occur as human friendly as possible in near future.

KEYWORDS : Artificial Intelligence, Legal implications, ethical implications, India, U.S, Germany, NITI Ayog, National AI strategy, frameworks.

1. Introduction -

Artificial intelligence (AI) is an escalating space, which has seen encouraging development in recent past decades. From our GPS system to Google translate service to the recent face recognition features of our smartphones and many more such innovations, AI has already made a space of its own in our day to day lives and human civilisation can be seen inclining more towards it for an easy and hassle free daily life. However, AI is a broad conceptual term for the science of creating intelligent machines, especially by creating intelligent computer programs. These are basically algorithms building mathematical data to allow a processor make human-like choices and human-like prediction without any support of human emotional intelligence or human reasoning, is what is labelled as computer intelligence. Machine learning and computer intelligence cannot be compared with human reasoning and human emotional intelligence at this level. The recent developments in this field of machine learning has seen many advantages and disadvantages that have been added to human society which includes several ethical as well as legal implications surrounding the emerging developments.

2. Evolution of AI

After decoding the Nazi encryption machine mystery and contributing to the win of Allied Forces in the second World War, well known mathematician *Alan Turing* made heads turn for one more time with just a simple question that is : "*Can machines think?*"¹ and Turing's test, whereas, proposed the vision and goal of Artificial Intelligence. Still there is no concrete definition of AI that one can describe.

Since the last six decades, there have been several advances in search algorithms, machine learning algorithms, and integrating statistical analysis into understanding the world of artificial intelligence at large.²

Several recent advances have made possible the creation of AI tools, and following factors have contributed towards the AI research :

- Rise of the digital economy, which provides large amounts of data.
- Advanced next generation computing architecture.
- Progress in cloud computing resources.
- Rise in demand for widespread access to services such as speech recognition and navigation support, google translation service.

¹ A. M. Turing (1950) Computing Machinery and Intelligence. Mind 49: 433-460.

² The History of Artificial Intelligence, History of Computing CSEP 590A, University of Washington, December 2006.

- Access to historic datasets.
- Progress in advancement of deep neural networks.

There are two forms of AI currently, which exist as either ‘*narrow*’ AI or ‘*artificial Super intelligence*’ (ASI). These applications aim to take actions within a limited set of context and parameters.³ Any time we communicate with a device to book film tickets, the face recognition feature on our phones, speech and voice recognition features, self driving car, GPS directions, do come under the category of weak or “narrow” AI. While these machines may seem intelligent with their features, they operate under a narrow set of constraints and limitations, which is why this type is commonly referred to as weak or narrow AI. These are programmed to perform singular tasks.

Whereas, ASI is where the programmed machines become self-aware and sometimes surpasses the capacity of human intelligence and decision making ability. It is on its way in making for the future. The tasks such as trading stocks, flying military planes and keeping a self driven car within its lane on the road keeping safe distance from other cars on road are now all within the domain of ASI. As the applications with Artificial Super Intelligence (ASI) are expanding, the risk of these applications malfunctioning or operating in unexpected ways outside the control or command of humans put up a serious concern.⁴

3. Implications of AI

While it is hazardous to accurately anticipate how shall be the emergence of AI technologies may impact society at large, it is important for policy makers to initiate the process of understanding the truly disruptive nature of these technologies. These technologies possess several implications, which shall be further categorised as ethical and legal implications.

- Ethical implications of AI

Futurists such as *Stephen Hawking* and *Sam Harris* had feared that AI could one day pose an existential threat: a “superintelligence” might pursue goals that prove not to be aligned with the continued existence of humankind. Such fears relate to “strong” AI or “artificial super

³ Benjamin Cheatham, Kia Javanmardian, and Hamid Samandari, *Assessing the risks of Artificial Intelligence*, WORLD ECONOMIC FORUM, (Dec 16, 2020, 14:43 PM) <https://reports.weforum.org/global-risks-2017/part-3-emerging-technologies/3-2-assessing-the-risk-of-artificial-intelligence/>

⁴ Mirjana Stankovic, Ravi Gupta, Gordon I Myers, Bertand Andre Rossert , *Exploring legal, ethical and policy implications of artificial intelligence*, Researchgate.net, Pg 3, LJD (2017) https://www.researchgate.net/publication/320826467_Exploring_Legal_Ethical_and_Policy_Implications_of_Artificial_Intelligence

intelligence” (ASI), which does not exist yet, but would be equivalent to human-level awareness and reasoning capabilities.⁵

Removing human action can definitely increase efficiency. However, there are dangers in completely eliminating human oversight.

There are some ethical and implications on this emerging technology which are as follows :

1. **Replacing human workers** - Modern economic systems require the blood and sweat of human workers to work and contribute towards the production of products or services with their compensation based on an hourly wage or monthly salary, including occasional bonuses, which varies from place to place. Whereas, the companies pay wages, taxes and other allowances and expenses, with the left-over profits that are often being pushed back into production, training, recruiting more numbers of human workforce or creating more business to further increase profits so that the economy continues to grow. One and foremost concern related to the growing technology of AI is loss of human jobs.

The question here arises, Can humans lose their jobs to AI driven systems? And what happens if AI driven systems are introduced in the modern economic flow?⁶ The step towards this new age of digital transformation is creating concerns about labor workforce displacement. .

- **Security** - Gone are the days when battles were fought on ground with heavy weapons, men losing their lives for their nation with the destruction of life and property all over, in this age of this AI driven technology, the battle is to be fought on cyberspace. Cyber security, the regulations related to data protection and several human rights would be more important. These AI driven technology possesses more threat if used maliciously.
- **Rights of AI driven systems** - The future of technology with the ‘Artificial Super Intelligence’ that is, ASI holds the capability of human intelligence and human alike decision making powers. While humans have the status of being ‘legal persons’ and have been endured with several rights and duties under the jurisprudential laws. Whereas, an AI lacks any kind of legal status.

Hereby, the question arises as, What is the legal status of an AI driven system or an AI driven robot? Should it be granted with certain rights along with the rights of Corporations?⁷ Who is to be held liable for any error being committed on the part of an AI system?

⁵ Ibid.

⁶ *The 7 most pressing ethical issues in Artificial Intelligence*, Kambria Accelerating open innovation, (17 Dec, 2020, 15:23 PM) <https://kambria.io/blog/the-7-most-pressing-ethical-issues-in-artificial-intelligence/>

⁷ Julia Bossmann, *Top 9 ethical issues in artificial intelligence*, WORLD ECONOMIC FORUM (21st Oct, 2016), <https://www.weforum.org/agenda/2016/10/top-10-ethical-issues-in-artificial-intelligence/>.

- Legal Implications of AI

Courts in a number of countries had to address a series of legal questions in relation to the automatic nature of these intelligent machines and systems. AI somehow has the capacity to challenge numerous legal assumptions in the short term as well as in the long term.

As an emerging technology, with its rapid growth has proposed a serious public concern in the present scenario, where the decision is being taken by an AI developed system rather than a human being. It raises important ethical and security concerns that could diminish the human trust in emerging AI driven technologies if not addressed thoughtfully.

While the extent of implications that an AI can cause is still unknown but here are some of the legal issues related to AI. They are such as:

- **Applicability of “rules of attribution”** - The current legal system does not confer any legal personality to AI. For example: as per English law, an automated system cannot be considered as an agent. Only a human with a mind can be considered as an agent.⁸ In the case of *United States of America v. Athlone Industries*⁹, the U.S. Court of Appeal has observed that “robots cannot be sued” citing a similar kind of reason.

AI has not been conferred with any separate legal personality yet. It is to be determined on who is to be attributed with such liability, if such liability can otherwise be established by the legal systems. The rules widely known as “rules of attribution” determine the attribution of both civil and criminal liability in many jurisdictions.

These rules in the common law jurisdictions include agency principles in contract (Principal - Agent) and vicarious liability in tort. They generally attribute liability to a legal person, when that liability ought to arise through the acts or omissions of a natural person, that is, a human. So, with the absence of a separate legal personality for AI, Can the acts or omissions of an AI acting autonomously with the ability of human emotional intelligence and human decision making power be attributed to a company or corporation responsible for creating it?

The current legal system not only has to look forward to addressing these questions but also the courts should also look up to extend the rules of attribution to attribute liability to a legal person when that liability ought to arise through an act or omission of something other than a natural person, such as an automated machine.

- **Human rights considerations** - AI has the potential to raise significant ethical and legal questions about human rights. AI enabled weapons systems, criminal justice, healthcare

⁸Software Solutions Partners Ltd, R (on the application of) v HM Customs & Excise [2007] EWHC 971, at paragraph 67.

⁹ United States of America v. Athlone Industries, 746 F.2d 977, 979 (3d Cir. 1984), U.S. Court of Appeals for the Third Circuit

and welfare structure are all areas where human involvement in decision-making may be replaced by these self automated decision-making bots. With its potential to create new kinds of domination, in many cases it tends to affect the most powerless and vulnerable ones in the society. Whereas, The basic concept of human rights addresses unequal power distributions and provides individuals with the language and procedures to contest the actions of more powerful actors, such as states and corporations.¹⁰

- **Intellectual Property Law** - The nature of AI gives rise to challenges under existing IP legal frameworks, many of which do not address the IP position in relation to machine-created works. For instance, The WIPO's definition of intellectual property "refers to creations of the mind," but does not exclusively claim that the "mind" be human.¹¹ An AI generated system can create new works and new inventions but here comes the question of Who can own the Intellectual Property rights in relation to a machine-generated or an AI generated original works? Can a machine be considered as an inventor under the applicable patent laws? If the machine cannot be an inventor, then another third party, namely the operator or developer of the system shall be considered the inventor or owner of the rights to the inventions? In that case the existing IP laws need to be revised to address the AI generated works in jurisdictions.

4. Recent regulatory frameworks around the globe

- **Germany** -

Germany is looking forward to lead Europe in self-driving cars and is reportedly working on a broad framework to regulate these self - driving cars. The framework is currently under the radar of the government departments.

As with other countries, Germany currently does not have an AI specific legal regime to govern its liability issues. The Government of Germany launched its '*artificial intelligence strategy*' in November 2018. The strategy opts to discuss the progress and further strategies to be made regarding AI in Germany and the objectives to be achieved in the future with a solid plan of policy actions on how to utilise them and then move on to implement them.¹²

¹⁰ Christiaan Van Veen, *Artificial Intelligence: What's Human Rights Got To Do With It?*, (May 14, 2018) <https://points.datasociety.net/artificial-intelligence-whats-human-rights-got-to-do-with-it-4622ec1566d5>

¹¹ Mirjana Stankovic, Ravi Gupta, Gordon I Myers, Bertand Andre Rossert , *Exploring legal, ethical and policy implications of artificial intelligence*, Researchgate.net, Pg 3, LJD (2017) https://www.researchgate.net/publication/320826467_Exploring_Legal_Ethical_and_Policy_Implications_of_Artificial_Intelligence

¹² C. Koch, AI Made in Germany — The German Strategy for Artificial Intelligence, TOWARDS DATA SCIENCE, (last visited on Dec 16, 2010, 12:28 PM) <https://towardsdatascience.com/ai-made-in-germany-the-german-strategy-for-artificial-intelligence-e86e552b39b6>

The initiatives highlighted in the Germany's strategy plan intends to look forward towards the following objectives¹³:

- Increasing Germany's place in the race of AI technology in Europe
 - Assuring a responsible development of AI technology which serves for the betterment of human society.
 - Utilising AI technology in cultural and legal ways as well in the context of a broad societal and political measures.
- **Objectives of the Draft -**
 - **Human development** - The strategy focuses on working towards providing a correct framework for betterment of the present and the coming generations for the drastic technological changes that would arise due to the deployment and development of AI technology. Which also requires the citizens to be aware of the future.¹⁴
 - **Upgrading work force** - The strategy discussed regarding the government's plan on upgrading the AI related skills of the workforce because the AI in this world would require different sets of skills to make it work and also to work with it. Furthermore, it plans to establish regional Centres of Excellence for Labour.
 - **Identifying labour demands** - The policy and the policy makers are aware of the need of upcoming skill and demand to respond in a way that it doesn't affect the demographic and technological labour demand in the market.

Hence, the initiatives aim at satisfying the needs of both the employees and the employers by incorporating a Skilled Labour Strategy system guided by a skills monitoring system to identify the skills that are needed in the coming future.

The success of the German AI strategy would go hand in hand with a well developed legal framework. The legal framework provided in the German AI strategy and the following are some initial steps towards a legislative framework for AI which are :

- The launch of Commission on Competition law
- The launch of Opportunities for Qualifications Act
- Initiating the Launch of Skilled labour Immigration Act,
- Adoption of Workforce Data Protection Act
- Adaption of the legislation concerning the use of non-personal data such as copyright if necessary.
- Implementation of the cyber security directive under the NIS Implementation Act,

¹³ *Germany AI Strategy Report*, EUROPEAN COMMISSION - KNOWLEDGE4POLICY (last visited on Dec 18, 2020, 12:32 PM) [https://knowledge4policy.ec.europa.eu/ai-watch/germany-ai-strategy-report_en#:~:text=In%20November%202018%2C%20the%20Federal,Affairs%20\(Germany%2C%202018\)](https://knowledge4policy.ec.europa.eu/ai-watch/germany-ai-strategy-report_en#:~:text=In%20November%202018%2C%20the%20Federal,Affairs%20(Germany%2C%202018))

¹⁴ *National Intelligence Strategy*, The Federal Government of Germany, (Last visited on Dec 18, 2020, 13:32 PM) https://www.ki-strategie-deutschland.de/home.html?file=files/downloads/Nationale_KI-Strategie_engl.pdf

- The strategy also plans on working on its ethical and legal front in accordance to the EU guidelines.

The Federal Government of Germany in its recently published the plans and strategies are still in process.

- **USA -**

On January 13, 2020 the government of the U.S The National Institute of Standards and Technology has publicly made the final draft plan public to prioritise its participation in the strategies for artificial intelligence (AI).¹⁵

The plan has laid down several requirements that firmly establish the U.S policy of development and innovation in the field of AI which are such as¹⁶ -

- **Public trust** - The federal regulation of AI must be capable of attracting public trust and also should be reliable which shall help the current and future generation to be prepared for the upcoming technological changes.
- **Public participation** - Agencies should welcome public oversights and public recommendations while making any laws on AI.
- **Scientific Integrity and quality research** - The strategy also discusses on encouraging quality scientific research in the field of AI, and is looking forward to implement research policies
- **Risk assessment** - The strategy looking forward to approaching the regulation from a risk based assessment, where it acknowledges and accepts that AI is not perfect.
- **Flexibility** - The drafted rules should be flexible enough to adopt rapid growth and flexible with the changes in the rules, regulations and policies.
- **Non - bias and Non-Discrimination** - The focus should be on the outcomes of the AI decisions with focus on unintended discrimination and bias compared to the existing processes as a baseline.
- **Transparency** - The requirements for regulations of transparency under the draft must be context based. The disclosure and transparency in the procedure would increase public trust in it.
- **Safety and Security** - Agency regulations must focus on their controls over confidentiality, availability and integrity of the public data used in an AI application. Agencies should be thoughtful and aware of any potential security and safety risk, as well as the risk of possible malicious or evil use of any AI applications.

¹⁵ Sebastian Moss, Understanding the United States' national AI strategy, DATACENTREDYNAMIS.COM, (Feb, 12, 2019) <https://www.datacenterdynamics.com/en/analysis/understanding-united-states-national-ai-strategy/>

¹⁶ Lynne Parker, The American AI Initiative: The U.S. strategy for leadership in artificial intelligence, OCED.AI PUBLIC OBSERVATORY, (June 11, 2020) <https://oecd.ai/wonk/the-american-ai-initiative-the-u-s-strategy-for-leadership-in-artificial-intelligence>

- **International coordination** - Engaging with international allies to advance AI standards for United States economic and national security needs.

Objectives of the Government in the draft are as follows¹⁷:

- Government's stand in regulating AI in the private sector.
- The Government's stand on maximum encouragement of AI innovations and policy frameworks.
- The Government's stand on removing the roadblocks to AI's growth in the country.

The draft contains guidelines on how the government of the US should regulate the standards on AI. The drafted rules outline different activities that would enable the administration to advance the utilisation of AI and various state rules that ought to regulate any future standards for the AI.

● INDIA

NITI Ayog released a policy paper, 'National Strategy for Artificial Intelligence', which has accepted the importance of AI and how it would be beneficial for several sectors in India. While all of these developments are happening on the technological front and are happening so fast, no comprehensive legislation to manage this growing industry has been formulated within the country till date.

The National AI strategy needs to work on frameworks that would be applicable to the unique conditions of India and it's unique needs while at the same time, is capable of achieving AI related milestones.¹⁸

There are three components related to the strategy, that is¹⁹:

- **Opportunity** - AI as an emerging technology has the potential to overcome the limitations of the capital as well as labour. AI innovations in one sector will have positive consequences in another.
- **For social good** - A disruptive technology, whose capabilities are unknown and such needs to be seen from the point of view of the transformative impact it could have on the greater good than bad
- **Providing a playground**- In addition to providing unique opportunities, India plans to provide a "playground" for enterprises, companies and institutions globally to develop solutions which can be easily implemented by the developing economies.²⁰

¹⁷Joel Nantais, *Federal Government Regulation of AI*, TOWARDS DATA SCIENCE (Last visited on Dec 17, 2020, 18:24 PM) <https://towardsdatascience.com/federal-government-regulation-of-ai-4fa08b7bd99a>

¹⁸ NITI AYOOG, *National Strategy for Artificial Intelligence*, https://niti.gov.in/writereaddata/files/document_publication/NationalStrategy-for-AI-Discussion-Paper.pdf?utm_source=hr_intelligencer

¹⁹ Ibid.

NITI Aayog has recognised some core areas for application of artificial intelligence:

- Healthcare: For easy access and affordability of quality healthcare.
- Agriculture: in view of enhancing farmers' income, farm productivity and reduction of wastage. Agriculture sector is witnessing a large participation of AI startups such as – Intello Labs, Trithi Robotics.
- Education: For easy access and quality of education.
- Infrastructure: For efficient connectivity for the rural and urban population.²¹

Challenges to Adoption of Artificial Intelligence in India

- Low pace of AI research
- Inadequate availability of AI knowledge and skills.
- low awareness for adopting AI in business processes.
- Balancing ethical considerations with the need for innovation and converting it to national good.

5. India's stand in the global strategic AI standards.

Minister of State for Statistics, Programme Implementation & Planning, Mr. Rao Inderjit Singh said that the government is looking forward towards the National strategy on artificial intelligence.

Different countries have focused on different aspects and priority areas on development and deployment of AI in their own respective countries. However, The capability of AI has already been acknowledged by the Government of India and is in the view that it can contribute to boosting India's GDP with USD957 billion by the year 2035. The government of India has been quite optimistic about the positive aspects that AI is going to put forward towards the overall growth of the nation, and these efforts are aimed at the recent developments in the field of AI and towards making the nation an AI power in the global platform. The US government has spent USD1.2 billion in a non classified research back then in 2016-2018 followed by a budget of USD3.44 billion was provided to the Defence Advanced Research Projects Agency in fiscal year of 2019-20, and that is an increment of 8.5% compared with its request for fiscal 2018-19. While India being, still way too far behind the US in terms of overall investment in AI, China has been really competitive in each and every aspect either be economy or AI regulations, It has

²⁰ NITI AAYOG, *National Strategy for Artificial Intelligence*, https://niti.gov.in/writereaddata/files/document_publication/NationalStrategy-for-AI-Discussion-Paper.pdf?utm_source=hr_intelligencer

²¹ Ibid.

had clear ambitions to achieve its AI goals in the end of 2020 and the world leader in AI by 2030, which is followed by another plan build up a USD150 billion domestic AI industry in China. It further plans to build a new AI industry including a national fund that supports research, from the most basic research to critical AI projects.

The United Kingdom too has already announced its national development strategy and issued a government report to accelerate the application of AI by government agencies back in 2018. The Department for Business, Energy, and Industrial Strategy released the Policy Paper - AI Sector Deal.²²

The Japanese government released its guidelines on Artificial Intelligence Technology Strategy in 2017.²³ Within the last several years, Countries such as Canada, UAE, Singapore, South Korea, and France too have come forward with their national AI strategy documents. Whereas, 24 member States in the European Union have already committed to develop national AI policies that reflect a “European” approach to AI. World’s largest civilian robotics program was launched by the EU named SPARC in 2014.²⁴ This clearly suggests that AI is quickly emerging as an important area to be included in national plans for several countries around the development of science and technology for sake of economic, national security and development. If India wishes to catch up with China, US and other countries in AI, it will have to invest huge funds in establishing the needed technology ecosystem and formulate a framework for ethics and standards in AI

6. Conclusion:

As the technology of artificial intelligence is advancing rapidly, India has the potential and ability to place itself among the top leaders on the global AI road map. With its initial steps to focus on five important sectors: healthcare, agriculture, education, infrastructure, and smart mobility, India has shown its intention towards its participation in the race of being a global leader in the field of Artificial Intelligence. There has been phenomenal growth on the part of the US and Germany with their strategy towards the next generation technology and India being way too far behind them. India too is getting serious about artificial technology. India is one of the fastest growing economies in the world with the addition of the tag of second-largest population in the world, India has a significant share in the process of revolution in the field of Artificial Intelligence, NITI Aayog acknowledged in its discussion paper titled ‘National Strategy for Artificial Intelligence’. Things considered in the discussion paper can be seen to be staking in the

²² GOV.UK, *AI Sector deal*, (Last visited on Dec 17, 2020, 09:45 AM)

<https://www.gov.uk/government/publications/artificial-intelligence-sector-deal/ai-sector-deal>

²³ Strategic Council for AI Technology, *Artificial Intelligence Technology Strategy (Report of Strategic Council for AI Technology)* last visited on (Dec 16, 2020, 16:46 PM) <http://www.nedo.go.jp/content/100865202.pdf>

²⁴ EUROPEAN UNION ROBOTICS, *European Robotics: Creating new markets for SMEs*, (last visited on Dec 18, 2020, 10:35 AM) <https://www.eu-robotics.net/sparc/10-success-stories/european-robotics-creating-new-markets.html?changelang=2>

paper itself, the process seen a very slow approach which are backed by several road blocks such as lack of expertise in application of AI and research, lack of funding for the AI backed projects, lack of adequate infrastructure, slow emergence of AI backed startups. Although India is working at a steady pace, the speed that India is moving with its AI strategy plan around establishing a comprehensive AI strategy for the future somehow isn't comparable to the pace of What the US and Germany is working.