Ministry of External Affairs
NEST Division

Artificial Intelligence: The India Story

Introduction

There is significant body of literature across academia, policy and industry on Artificial Intelligence (AI). Its current and potential impact on social, economic and political spheres is also very well documented. However, AI has become a victim to jargons, generalizations and misinterpretation. AI has become a trendy buzzword used across the spectrum. Defining AI has become difficult because its functionalities constantly are moving. AI is used to describe everything from automated software to high intelligent robots. There is a significant lack of uniformity even among experts on the definition of AI. One school of thought in AI philosophy says 'AI is whatever hasn't been done yet.'[1] Once systems like automated software become common place they are no longer considered AI. Thus, due to constantly shifting goalposts, it is difficult to define AI.

1. The genesis of AI began with Alan Turning who coined the famous 'Turing test'. The turning test specifies - if a machine can exhibit intelligent behavior comparable to human beings autonomously, then such a machine can be considered as a thinking machine. The turning test forms one of the bedrocks of philosophy of AI. John McCarthy is credited in coining the phrase 'Artificial Intelligence' to describe machines that can think autonomously. Since AI's beginning in the 1950's, debates have raged on how one classifies/defines notion of intelligence and the act of thinking.

2. Some of the definitions include, AI machines are machines that mimic human cognitive functions.[2] AI systems are systems that respond to external stimuli and takes optimal actions to maximize its chances of meeting its goal efficiently[3]. Over the past five decades, with revolution in information transfer streams, data storage and crunching capacities, and computing power, AI systems have not only mimicked human cognitive capabilities but also surpassed them in some areas such as chess

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[1] Maloof, Mark. "Artificial Intelligence: An Introduction, p. 37" (PDF). *georgetown.edu*. Archived (PDF) from the original on 25 August 2018.
[2] Russell, Stuart J.; Norvig, Peter (2009). *Artificial Intelligence: A Modern Approach* (3rd ed.). Upper Saddle River, New Jersey: Prentice Hall. ISBN 978-0-13-604259-4.
[3] Definition of AI as the study of intelligent agents:

- Poole, Mackworth & Goebel (1998), which provides the version that is used in this article. These authors use the term "computational intelligence" as a synonym for artificial intelligence.[1]
- Russell & Norvig (2003) (who prefer the term "rational agent") and write "The whole-agent view is now widely accepted in the field".[2]
- Nilsson 1998
- Legg & Hutter 2007

and computing of large amount of information. According to National Strategy on AI, a discussion paper released by Niti Aayog, AI is a constellation of technologies that enable machines to act with higher levels of intelligence and emulate the human capabilities of sense, comprehend and act.[4]

3. Other terms used loosely or interchangeably with AI are Machine Learning and Deep Learning. However, it is important to understand the differences. Machine and Deep Learning are considered to be part of AI. Machine learning is a process where through algorithms, systems automatically learn from data and make decisions or predictions without explicitly being programmed for. Deep Learning is a class of Machine Learning where multilayered algorithms like advanced neural networks are used to extract patterns to make decisions or predictions.

4. Commonly used categories to classify AI are Strong AI and Weak AI. Strong AI also called AI general intelligence is a long term goal of AI research that aims to completely mimic properties of natural intelligence of consciousness and sentience[5]. On the other hand, Weak AI or Narrow AI is aimed at mimicking specific tasks. These AI systems simulate intelligent actions. Based on these definitions, all AI current systems can be classified in the narrow AI category. Some narrower than the others.

5. Some of the success stories of cutting edge narrow AI systems include development of GPT 3 (Generative Pre-trained Transformer 3), a seminal development in natural language processing where the algorithms can write essays, translate languages, answer questions, and write codes.[6] Another groundbreaking development in the AI ecosystem include, DeepMind's program called AlphaFold which was able to solve the protein folding problem.[7] The ability to predict how proteins fold can unlock groundbreaking solutions in drug discovery and understanding of diseases. Even though these two breakthroughs still need to be independently verified and re-implemented as the codes are not publically available, largely the AI community considers it as massive technical leap in AI development.

6. As the literature on the role and impact of AI in the foreign policy is still in its nascent stage, this position paper will attempt to unpack definitions, map AI ecosystem in India and understand foreign policy implications of AI to India.

[4] https://niti.gov.in/writereaddata/files/document_publication/NationalStrategy-for-AI-Discussion-Paper.pdf
[5] Searle, John (1980), "Minds, Brains and Programs" (PDF), *Behavioral and Brain Sciences*, **3** (3): 417–457, doi:10.1017/S0140525X00005756
[6] https://openai.com/blog/openai-api/
[7] https://deepmind.com/blog/article/alphafold-a-solution-to-a-50-year-old-grand-challenge-in-biology

Background

Policy

7. India's march towards developing a national AI strategy, with an aim to harness the potential of AI for equitable, inclusive and sustainable economic and social growth, began in 2017 with the setting up of an AI task force. With a view towards developing frameworks for promotion of deployment of AI solutions, Ministry of Commerce and Industry set up the task force to begin the use of AI for economic transformation. The report identified areas that the Government should play a role in, sectors that can generate employment and growth by the use of AI technologies, and roadmap of how AI solutions can help solve problems at scale.[8]

8. In 2018, NITI Aayog was mandated to develop the National AI programme for India. With a view towards to achieving the mandate, the national AI strategy report was developed. The Strategy is termed "AI For All" as it is focused on leveraging AI for inclusive growth in line with the Government policy of "Sabka Saath Sabka Vikas". The role of the Government has been clearly delineated to develop the research ecosystem, promote adoption and address skilling challenges. The strategy also flags important issues like ethics, bias and privacy issues relating to AI, and envisions Government promoting research in technology to address these concerns. The focus of the report is on governance, agriculture, health, energy, education, smart cities and infrastructure, and smart mobility and transportation.[9]

9. In 2018, under the Prime Minister's Science, Technology and Innovation Council (PM-STIAC)'s mandate, AI was identified as one of the nine Missions.[10]

10. In January 2020, NITI Aayog released an approach paper called AIRWAT (AI Research, Analytics and Knowledge Assimilation platform) with an aim to establish AI specific cloud computing infrastructure for India. To develop and deploy any AI solutions at scale, a well access to computing resources and infrastructure a pre-requisite. The goal of the paper is to facilitate the development and implementation of new and emerging technologies similar on the lines of Unified Payments Interface (UPI) which is an underlying payment infrastructure for payments has helped create several innovations, thus revolutionizing the digital payment ecosystem in India. Implementation of AIRWAT is seen to play a similar role of the AI ecosystem.[11]

[8] https://dipp.gov.in/whats-new/report-task-force-artificial-intelligence
[9] https://niti.gov.in/sites/default/files/2019-01/NationalStrategy-for-AI-Discussion-Paper.pdf
[10] https://www.psa.gov.in/pm-stiac
[11] https://niti.gov.in/sites/default/files/2020-01/AIRAWAT_Approach_Paper.pdf

11. In June 2020, a working document on Responsible AI or AI for All was published by NITI Aayog. The goal of the document which was developed after a several rounds of stakeholder consultations was to further identify economic and sectorial potential for AI deployment, and develop an AI strategy for rapid adoption of AI solutions across academia, industry and government. It further identified system level challenges such as privacy, discrimination, lack of accountability of AI systems and societal level challenges such as loss of jobs and threat to social harmony. Through understanding use cases, legislations of AI in decision making, benchmarking against global standards, and exploring best practices, the document establishes AI principles, identifies policy and governance recommendations, and develops enforcement structures and incentive mechanisms for responsible AI.[12]

12. In the last 2 years, several line ministries and State Governments have developed significantly large AI initiatives and programmes. From the vantage of policy frameworks and backend infrastructure, three line ministries stand out.

13. In 2018, the Ministry of Electronics and Information Technology (MeitY) set up four Committees to develop a policy framework on AI. The goal was to propose action in areas of platform and data for AI, leverage AI for identifying National Missions in key sectors, map technology capabilities, identify key policy enablers required across sectors, identify skilling and reskilling needs and consider cybersecurity, legal, ethics, safety and ethical issues.[13]

14. In May 2020, MeitY in collaboration with NASCOMM and NeGD launched the National AI portal called INDIAai. INDIAai is a central repository for information on all AI related developments in India.[14]

15. In September 2020, Department of Telecommunication (DoT) released a draft framework of the Indian Artificial Intelligence Stack. On the similar lines as the technology stack developed for Aadhar and UPI backend infrastructure, the AI stack will look to constitute layered infrastructural components to develop and deploy AI solutions at scale. The goal of the AI stack will be to facilitate interoperability and standardization of AI solutions.[15]

[12] https://niti.gov.in/sites/default/files/2020-07/Responsible-AI.pdf
[13] https://www.meity.gov.in/artificial-intelligence-committees-reports
[14] https://indiaai.gov.in/article/how-meity-spearheaded-india-s-ai-ambitions-in-2020
[15] https://www.tec.gov.in/pdf/Whatsnew/ARTIFICIAL%20INTELLIGENCE%20-%20INDIAN%20STACK.pdf

15. In January 2021, a draft of India's fifth National Policy on Science, Technology and Innovation called STIP 2020 was released which highlights the need of indigenous development AI tools especially in the area of education and healthcare.[16]

Guidelines and Regulations

16. AI regulations and laws around data are two intensely debated topics in the world. There are four necessary components needed to have a holistic legal and regulatory framework – 1) AI Principles to guide the formation of standards, 2) Overarching regulations specific to AI development and deployment, 3) Sector specific regulations vis-a-vis AI, and 4) Sector agnostic laws related to AI.

17. The working document by NITI Aayog has come up with AI principles namely Safety and Reliability Equality; Inclusivity and Non-discrimination; Privacy and Security; Transparency; Accountability; Protection and Reinforcement of positive human values. Currently there are no AI specific regulations in India. However, there are some sector specific AI related regulations in the area of healthcare and finance. Regarding AI adjacent laws, there are a few legal instruments to protect privacy and inclusiveness. However, there is a need for a large framework that can adopt to the AI ecosystem. India is also at the cusp of coming up with a personal data protection legal framework.[17]

Societal Adoption of AI solutions

18. Digitization – process of converting information from analog to digital and digitalization – adoption of digital technologies to improve business, governmental and organizational processes are pre-requisites for deployment of AI solutions in India. There are two inflection points in the past five years that has paved the way for digital transformation of society and thus in turn towards deployment of AI based solutions. Demonitisation coupled with financial inclusion programmes and development of back-ended infrastructure such as technology stacks for UPI, compelled citizens to move towards cash less transactions. A wider net of citizens are connected to the governance ecosystem. The other inflection point is the Covid crisis which compelled citizens to utilize digital solutions to receive services. Through, hundreds of market-based and governmental solutions, the education and communication industry along with other sectors like healthcare and retail stand transformed during the Covid period. As the wider section of society is digitally literate and

[16] https://dst.gov.in/draft-5th-national-science-technology-and-innovation-policy-public-consultation
[17] https://niti.gov.in/sites/default/files/2020-07/Responsible-AI.pdf

connected along with the development of technology stacks, the environment is ripe for deployment of AI based solutions. To add a caveat, there are several legacy physical infrastructures in the area of water, energy that cannot be overhauled or transformed in quick time, a process of digitization and digitalization need to take place before AI solutions are deployed.

Academic

19. Through the vantage point of the Academic ecosystem, several universities that offer computer science or engineering degrees offer courses related to AI at undergraduate and graduate level. In 2019-2020, IIT Hyderabad was the first university to establish a department of AI and offer full-fledged undergraduate and graduate level degrees.[18] IIT Delhi, a well renowned university in computer science and AI research, has recently established a School for AI. The aim of this specific school of AI which plans to offer PhD degrees in AI related applications is to become a one-stop center for industry or governmental entities interested in collaborating or funding AI innovation.[19] In addition to degree programmes, several governmental and industry centres of excellence and international collaborative projects are set up to incentivize AI innovation in India. Evaluating through the perspective of scientometric analysis, in recent times, India ranks third in number of publications and citations.[2021] However, India lags far behind the leaders, namely China and United States.

Review of current AI projects sector wise to understand demand driven capacities

Education

20. The National Education Policy 2020 (NEP 2020), India's first education policy in the 21st century, emphasizes the importance of AI and integrating AI education in all sectors at all levels. The policy outlines the need to instill design and computational thinking to improve digital literacy amongst school students. Machine Learning, data analysis and other contemporary skills is intended to be integrated into undergraduate programmes to develop industry ready professionals. All universities to offer multidisciplinary courses and degrees in topics related to AI as well as offer low expertise AI adjacent topics such as data annotation and speech transcription. The goal of the policy is to produce 21st century professionals trained in AI and related emerging technologies. The policy also highlights to use AI as a tool to unlock value from our multilingualism and integrate with our natural language processing capabilities. It also calls for developing AI tools for designing,

[18] https://ai.iith.ac.in/btech.html
[19] https://home.iitd.ac.in/news-ai.php
[20] https://www.scimagojr.com/countryrank.php?category=1702&order=ci&ord=desc&year=2019
[21] https://www.nature.com/articles/d41586-020-03409-8

monitoring and evaluating learning outcomes of students. Finally, the NEP 2020 calls for the development of National Research Foundation to fund and advance high quality peer reviewed AI research.[22]

21. Some of the current projects under the national programme and their associated technology stacks include the 1) Unified District Information System for Education, a comprehensive database of schools which records and measures information related to social factors, performance indicators, and availability of facilities. 2) Performance Grading Index to provide insights on status of education on States and UTs. 3) Portal for MOOC educational content (SWAYAM); repository for digital content such as e-books and journals; repository for hands on education like virtual labs; access to open source software; and portal to track progress for students and teachers.[23]

22. The above backend technology stack is developed and is currently in operation. Integration of AI based solutions with the technology stacks mentioned earlier can pave a way in developing customized learning tools to meet individual student's needs; interactive tutorials that provides personalized feedback and recommendations; predictive tools to identify patterns such as student drop rates, inclusiveness, and bias; assessment and evaluation tools to track progress of individual students; and natural language processing systems to create and disseminate content in all regional languages. Currently there are several market-based solutions in the form of EdTech solutions offered by companies such as BIYJUS or UNACADEMY that provide many of the above highlighted solutions to improve education outcomes of students.

Agriculture

24. The report on the committee on doubling farmer's income volume XII discusses the role of BigData, Internet of Things (IoT), AI and Blockchain technologies in agriculture.[24] The National Strategy on AI by NITI Aayog identifies AI as a priority area vis-à-vis deployment of AI based solutions.[25] In 2019, NITI Aayog released a follow up report on the role of AI in agriculture where specific areas such as 1) Financing such as insurance payouts and risk profiling, 2) Farm inputs such as access to agri-extention workers, 3) Farming such as real-time yield forecasting, predictive pest management, precision farming, and 4) Selling and distribution such as track and trace of produce were identified for deployment of AI solutions. In order to scale deployment of AI solutions, creation of an AGRISTACK was proposed to include annotated datasets based on common agricultural data standards and an API layer

[22] https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
[23] https://www.education.gov.in/en/ict-initiatives
[24] https://farmer.gov.in/imagedefault/DFI/DFI%20Vol-12A.pdf
[25] https://farmer.gov.in/imagedefault/DFI/DFI%20Vol-12A.pdf

for access of relevant data.[26] The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020 highlights the establishment of electronic registration and transaction units along with development of price information and market intelligence systems for farmers' produce. Secretary MEITY recently revealed that the blueprint of AGRISTACK or KISANSTACK will be released soon. Development of such a technology can accelerate deployment of AI solutions to address problems related to credit financing, price discovery, wastage, and forecasting. However, the interplay between the soon to be released data protection bill and development and use of database for agriculture will have an important impact on the deployment of AI based solutions.

25. The AI projects in agriculture can be typically classified into five areas: 1) Smart Datafeed Units where large data is fed into AI systems to assist in precision farming. There are several startups such as Aibono that provide real-time precision farming solutions. 2) Forecasting systems that use machine learning algorithms to detect patterns and help in disease detection, yield estimation, etc. For instance, Pradhan Mantri Fasal Bima Yojana (PMFBY) where AI based solution is used to optimize crop cutting experiments in various states for yield estimation.[27] 3) Digital Assistant Units that facilitate capacity development and help farmers make informed decisions by providing recommendations, interactive sessions for knowledge transfer on information related to seeds, soil content, weather patterns, supply demand information etc. For instance, a startup called DeHaat provides 24/7 digital advisory services to farmers in UP, Odisha, Bihar and West Bengal.[28] 4) Video and Image analysis to identify, trace, measure agriculutural produce's quantity and quality. For instance, a startup called Intello Labs uses image processing techniques to assess food quality.[29] 5) Robots (Drones) programmed for surveillance of crops, monitoring forest fires etc.

26. Global trends such as climate change, population growth and urbanization are making supply chain networks difficult to understand, analyze, and predict. These complex forces manifest as risks to our food systems making the food supply chain opaque. Poor understanding of these interactions leads to vast information gaps in the food supply chain and thus lead to poor decision making. There needs to be a paradigm shift in how data is collected, processed, shared and used. The integration of different components of the food supply chain is of critical importance to meet the ever-increasing demands while maintaining the ecological balance. A well-connected supply chain may help to increase efficiency of crop production, improve

[26] https://farmer.gov.in/iaof/iaof_admin/Data/403_Role%20of%20Digital%20and%20AI%20Technologies%20in%20Indian%20Agriculture-%20Mr.%20Tanay%20Mahindru.pdf

[27] https://indiaai.gov.in/news/government-to-use-ai-for-studies-under-pradhan-mantri-fasal-bima-yojana

[28] https://indiaai.gov.in/article/ai-is-sowing-seeds-of-productivity-and-sustainability-in-india

[29] https://www.intellolabs.com/

inventory management, increase food safety, and reduce both waste and ecological footprint. New innovative digital information streams in real time could operationalize predictive science and technological inventions and help devise solutions to address inefficient and opaque food supply chain challenges. A digital ecosystem - internet of things, big data analytics, and artificial intelligence algorithms integrated over a blockchain network can act as an effective tool to significantly reduce these inefficiencies. Such a system can provide an in-built traceability, accounting and auditing provisions that will help in tracking agricultural produce through supply chain, enabling reduction of wastage, enforcing a system of quality verification to weed out bad quality goods, incentivizing actors in the supply chain to operate in good faith, penalizing rule violators, and allowing consumers to make well informed decisions. In addition, such an AI enabled ecosystem can help in streamlining agricultural finance, insurance, and payment processes.

AI and Foreign Policy Implications

27. AI as a topic for international discourse has taken prominence in the last few years. This is because AI applications are increasingly being used to understand, analyze, predict and in some cases address impacts of global trends such as climate change, urbanization, consumerism to name a few. On the flip side, there are also new and emergent threats to social equity, future of work, businesses, economy, international security, democracy, and human rights due to deployment of AI solutions. Due to the multidimensionality aspects of benefits and risks of AI, AI is becoming a crucial driving force in international relations.

28. International Security: AI based systems are impacting both traditional domains of conflict as well as contemporary ones such as cyberspace. In the traditional domain, for instance, AI is a chief instrument in development and deployment of lethal autonomous weapons. Nation states are increasingly investing in AI based weapon systems to gain strategic and tactical advantage. Such systems are seen to improve targeting processes and reduce human bias. However, it can further exacerbate the asymmetrical advantages afforded to countries that have invested significantly in AI development and affect the global balance of power. In addition, there are discussions in the multilateral fora around the ethical concerns on utilization of weapons that do not have an intervening human component. Warfare in the cyber domain has seen a significant rise in the recent past. Typically, these cyber-attacks are in the form of data breaches, theft of information, installation of spyware. However, with digitization of critical infrastructure of sectors such as energy, water, finance, health, transportation, cyber-attacks can result in crippling of systems, networks and assets and result in unforeseen damage on local population and the country at large.

29. Economy and Future of Work: According to the NITI Aayog report, AI will have a transformational impact on India's economy by adding 975 billion dollars by the year 2025. According to a report by Mckinsey, by 2030, AI is set to add 13 trillion dollar or about 16 percent higher cumulative GDP.[30] There are opportunities afforded to countries to leapfrog through early investment and adoption strategies vis-a-vis AI solutions. Industry ecosystem of BigTech companies and startups become critical in maximizing impact on economy from AI. However, the report also hypothesizes that countries that move in later in AI adoption might not generate the impact from AI because early investors and adopters might capture most AI opportunities. Thus, AI can reinforce the digital divide and widen the gap between the countries. The top AI countries can extract upto 20 to 25 percent additional economic benefit from AI whereas developing countries might capture 5 to 15 percent. Along the similar vector, companies that adopt AI early can double their cash flow as opposed to companies that do not can see a 20 percent decline, centers paribus[31]. Thus, the global economy will see a disproportionate distribution of benefits of AI. The impact of AI on labor market will be severe. Digitization is already automating jobs that encapsulate repetitive tasks. AI can further play a catalytic role in complete automation of manufacturing units and result in severe displacement of jobs. Without focused and relevant interventions in place, such AI based solutions can disproportionally impact the developing world. However, there is also potential for AI to create more jobs than it displaces. For instance, peer to peer platforms like Uber or Airbnb has facilitated monetization of assets owned by individuals. Similarly, AI can create such potential pathways for Future of Work. With deployment of AI solutions, the share of jobs available that require digital literacy skills will be high. Thus, a large-scale skilling and reskilling programmes will become crucial for citizens to adjust to the new normal.

30. Democracy, Privacy and Ethics: Data and AI – relatively new topics of discourse at the multilateral fora, form a backbone of most emerging technologies, create new avenues of threats vis-à-vis privacy, ethics and security along with opportunities vis-a-vis economics, health and social equity. Over the last two decades, technological innovations especially in the digital realm are affecting the notions of power and influence. For instance, with digital technologies introducing multitude of communication channels resulting in unprecedented connectivity, the concept of soft power has moved from nation states promoting their best commodity in the global sphere to an unregulated, disaggregated, individual generated content. As an unintended consequence, trolling, disinformation campaigns, conspiracy theories have been thriving under such unregulated information flows. In another

[30] https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy
[31] https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-modeling-the-impact-of-ai-on-the-world-economy

example, there is a growing response of nation states towards capitalization of emerging value of data and defending informational sovereignty. It is a reaction to the actions of the BigTech firms vis-à-vis exploitation of data through surveillance capitalism. Further, through network effects, these platforms accumulate user bases of billions and dominate global website traffic which has led the BigTech firms wielding unprecedented power over citizens' information streams and has potential to manipulate political opinions. These platforms are susceptible to manipulation of content through fake news, deep fakes videos, privacy threats, digital discrimination that have the capabilities to disrupt social harmony. This is reshaping the digital world with troubling implications on democratic principles and international collaboration.

Multilateral Co-operation on AI

31. AI, bedrock of new and emerging technologies, is shaping our social fabric and geopolitical relationships. Its impact poses novel challenges across disciplines. Hence global governance of these emerging technologies currently pose questions around how should policies and regulations address the new and emerging digital barriers? How can the global south develop its soft power around digital partnerships? And how can global governance systems around emerging technologies be more than the sum of its parts. From the perspective of capitalization of emerging value of data, nation states are waking up to unlock its value. This adds a new dimension to diplomacy. A potential future might include regional groupings of nations working together to collectively use data for their geopolitical advantage. Through a common set of data processing laws, common security standards, a common market for data, can increase the region's negotiating power globally and challenge traditional powerhouses. Data centers, critical to cloud computing, act as the backbone of all new age digital communications. With growing users of digital technologies, potential policies on data localization and cost-effective hardware available, data centers is the next big IT infrastructure market. It is possible that regional groupings can pool in resources to build data centers. As data centers are resource intensive in terms of electricity, water, and bandwidth. Such an endeavor can bring down the costs of storing and maintaining data. Should such a grouping become a cheap option for data centers, it would give the region an increased say in the global technological debate.

32. Towards the endeavor of Multilateral Co-operation on AI, India joined the Global Partnership on AI (GPAI) as a founding member. "GPAI is an international and multi-stakeholder initiative to guide the responsible development and use of AI, grounded in human rights, inclusion, diversity, innovation, and economic growth.[32]" The GPAI was launched in June 2020 under the ambit of G7. As one of the first such

[32] https://pib.gov.in/PressReleasePage.aspx?PRID=1631676

initiative, GPAI looks to foster international collaboration on AI research, build global cooperation and promote adoption of trustworthy AI. Other founding members include Australia, Canada, France, Germany, Italy, Japan, Mexico, New Zealand, the Republic of Korea, Singapore, Slovenia, the United Kingdom, the United States and the European Union. Brazil, Netherlands, Poland and Spain joined in December 2020. GPAI is supported by a secretariat hosted by the OECD and two centres of expertise housed in Montreal and Paris. These centres facilitate the operations of four working groups namely: 1) Responsible AI, 2) Data Governance, 3) The Future of Work, 4) Innovation and Commercialization. Through active collaboration, the working groups assess all kinds of information (scientific, technical, social and economic) required to understand the impacts of AI, encourage responsible development of AI and identify options vis-à-vis adaptation and mitigation measures.[33]

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[33] https://www.gpai.ai/about/