

India & The Global Partnership on Artificial Intelligence-The Way Forward

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Abstract

In the age of rapid advancements in technology, AI and machine learning have become the new norm. India has become the President of Global Partnership on Artificial Intelligence on the lines of G-20 Presidency. This paper would delve deeper into the know-hows of GPAI as well as the AI trajectory of India and what would be the way forward.

Note: This is a relatively developing topic so there is not much research on the subject available.

1.Introduction

Artificial Intelligence (AI) requires the machine to perform tasks in an intelligent manner in a similar fashion to humans. There are pros and cons associated with any major technological advancement so is the case with AI. While AI has the potential to bring about significant economic growth, it is anticipated that we might lose on some due to automation. Therefore, it is necessary to put in place the necessary policies and infrastructure.

“Though the field of AI has been an area of extensive research since the term was coined in 1956, it has recently only led to large-scale deployment of intelligent applications for different domains and tasks. The works in the late fifties and early sixties were in the direction of development of general techniques, which could be applied in several domains. The results were not very encouraging and it led to the first winter of the field, which started in the late sixties and continued till the late seventies. It was realized that the knowledge of the domain plays an important role and therefore, the focus of the research was on representing and using knowledge. The systems developed were called knowledge-based systems. MYCIN, a KBS using rules for representing knowledge of the experts was used successfully in the medical domain. A number of such systems were developed in other domains. As these were based on the knowledge of human experts, these were called expert systems. Several companies captured the opportunity. However, by the late eighties, it was found that the rules were often brittle and did not work in practical applications which required incorporating a large number of rules to deal with various scenarios. When several companies failed in

their efforts in applying the technology, there was general disappointment in the industry. The second winter of AI started in the late eighties and continued till the mid of the first decade of the current century when high computational power machines and storage became easily available and affordable. It was fuelled by the development of certain algorithms such as deep learning. Large-scale deployment could be easily possible on mobile phones using Internet. It may be noted that the periods of the two winters mentioned above are not precise due to obvious reasons” (Sunil Kumar Srivastava 2018).

“Considering recent advances in AI and its potential impact on job opportunities, each country needs to prepare an action plan to take advantage of opportunities and face challenges. Identify priority areas for technology development investment to create AI-based solutions. At the same time, steps should also be taken to prepare workers to accept the new types of work that may arise. A country cannot be immune to impact, but it can well manage it by putting in place the necessary infrastructure and policies” (US Government, 2016).

Many countries have formulated their policy for AI(U.S. Government, 2016; House of Commons Science and Technology Committee, 2016; State Council of China, 2017; Government of South Korea, 2017; Benner, 2017). India needs to capitalise on it. It already missed to reap the benefits of first and second industrial revolutions due to certain political factors at play. We were able to reap the benefits of the revolution due to IT(Information Technology) using the country’s tech talent. Fortune has not only been made by the export of software but also provided jobs to millions of educated people. This lies at risk today since most of the companies are automating the process using AI. Therefore, the country must be prepared to seize the opportunities and face the challenges brought by AI.

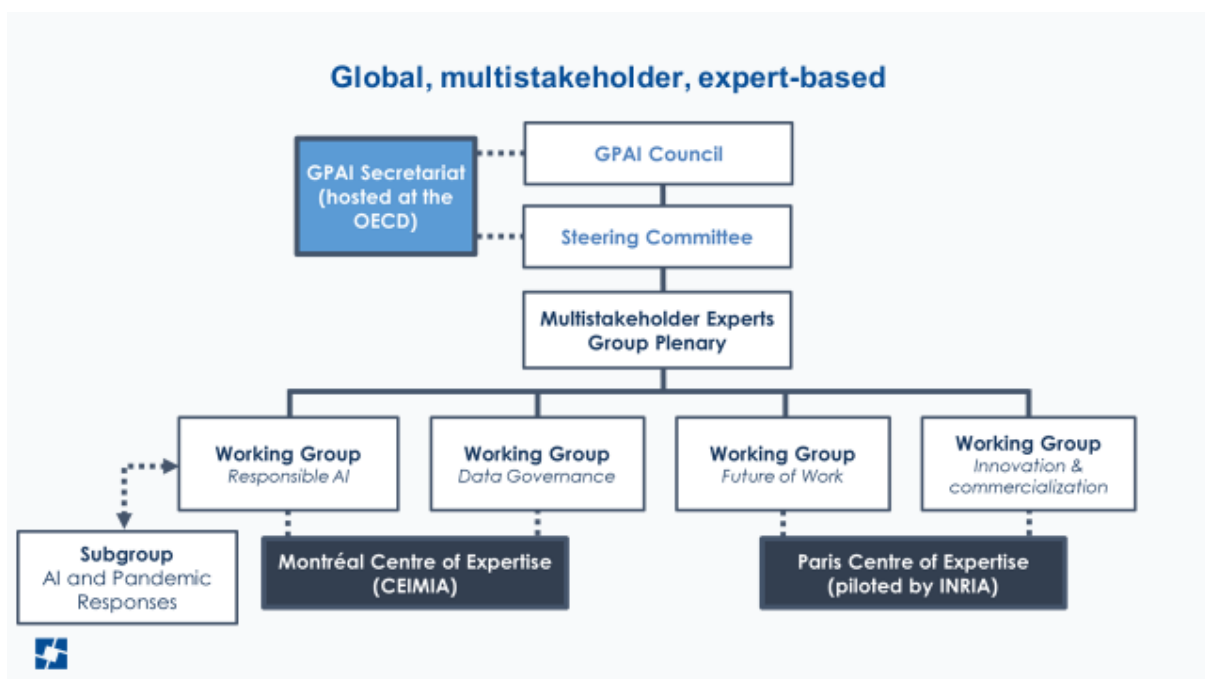
“An analysis of major economies (Purdy & Daugherty, 2016) shows that GDP growth has levelled off or declined in several developed countries over the past decades. The average GDP growth of Japan, the United States, the United Kingdom, France, Italy and Germany was 3.0 in the 1980s, 2.1 in the 1990s and 1.1 in the first decade of the current century. In. For a time, capital and labour were considered factors of production. However, studies show that the rate of capital efficiency has decreased. Furthermore, the working-age population is not growing in many developed countries. The net effect is marginal GDP growth in developed countries. Accenture analysed 12 major economies and predicted that AI adoption has the potential to double economic growth by 2035” (Sunil Kumar Srivastava 2018).

AI has the potential to drastically transform for good but at the same time it presents significant challenges if left unchecked. To ensure that AI is utilized to its full potential international collaboration and cooperation are necessary.

On the similar lines the Global Partnership on Artificial Intelligence which has been launched in 2020. It was first formally proposed Canada and France at G7 44th summit. “The purpose of the partnership is to act as a bridge and act as a point of contact for governments and world’s prominent AI experts in order to promote the human- centric development and use of AI in a manner that aligns with human rights, fundamental freedom and democratic values”(GPAI).

There are currently 29 members in GPAI namely the UK, the USA, Argentina, Australia, Belgium, Brazil, Canada, Czech Republic, Denmark, France, Germany, India, Ireland, Israel, Italy, Japan, Mexico, the Netherlands, New Zealand, Poland, the Republic of Korea, Senegal, Serbia, Singapore, Slovenia, Spain, Sweden, Turkey and the European Union.

“Four pillars of GPAI are Responsible AI, Data governance, Future of Work and Innovation & Commercialization. It consists of a Council and a Steering Committee and a Secretariat hosted by Organisation for Economic Cooperation and Development (OECD). There are two centres of expertise: The International Centre of Expertise in Montreal for the advancement of Artificial Intelligence in Montreal and French National Institute for Research in Digital Science and Technology” (GPAI).



(Source: GPAI) The Structure of GPAI

India assumed the chair on November 21, 2022 at the Tokyo summit by surpassing countries like USA and Canada in the vote count. “As one of the

largest Global South economies leading the AI race, India nominated itself for the position of incoming council chair of GPAI. India received more than two-thirds of first-preference votes and was therefore elected as the Incoming Council Chair in November 2022. India will serve as the Incoming Chair in 2023, then subsequently Lead Chair in 2024, and Outgoing Chair in 2025.”(MeitY)

India had been one of the founding members of GPAI in 2020. Indian economy is expected to grow by 967 billion US dollars by 2035 and is also expected to add 400-500 billion US dollars by 2025 to the country’s GDP accounting for 10 percent of the country’s GDP target.

2.Importance of Data Governance-Case Studies

Data Governance is extremely important with the emergence of advanced technologies such as AI. These case studies show us how things can go haywire without proper data governance and what are the benefits of AI with proper guidelines on the governance of data.

Case Study No. 1: AI recruitment tools – using faulty data for the AI at hand

In many sectors women are structurally underrepresented compared to men; this is especially true for managing or other well-paid positions. Where companies automatize their hiring process, the existing bias against women may also be reflected in the AI based hiring tool. (Reuters 2018). Recruitment algorithms usually assign scores to applicants (e.g. one to five, one being the worst, five being the best). Women are particularly disadvantaged if such scores do not reflect their abilities. Even though such unfavourable scores can also result from bias within the design of the algorithm itself, in the past, the problem seemed to stem even more from the wrong data sets being used. For example, if algorithms were trained to review applicants by observing patterns in resumes submitted to the company in the past and the majority of successful applications came from men, the algorithm will teach itself that male applicants are to be preferred over female applicants. However, such technologies could also be quite promising to reduce bias in traditional hiring decisions, as they can sometimes be more objective than HR officers (Harvard Business Review 2019) “This use case provides a well-established example of how the use of prejudiced data sets can result in discriminatory outcomes by AI-based systems. Effective data governance must ensure that the data used is suitable for the intended purpose”

(Data Governance Working Group A Framework Paper for GPAI's work on Data Governance 2020).

Case Study No. 2: COVID-19 research related to public health – lack of access to data required for AI

In the course of the COVID-19 pandemic, medical research is vital to overcome global challenges. In particular, there are research projects aimed at improving our understanding of COVID-19 by reviewing scientific literature and projects focusing on the development of tools to effectively combat the spread of COVID-19 with the help of medical or other data from individuals. Even though the latter might have a more direct and ad hoc influence on decisions of health authorities, they both show difficulties related to the availability and access to data. The lack of access to COVID-19-related literature results partly from business models of major publishing houses that limit public access entirely or at least access in machine-readable format, meaning an approach to data governance that significantly limits the use of AI in a way that hugely benefits our societies. Pressure by the WHO, individuals, and governments resulted in a commitment for publishers to provide machine-readable access to COVID-19 related publications. The resulting COVID-19 Open Research Dataset (CORD-19) consists of nearly 200,000 entries, including thousands of articles that serve as a basis for data mining exploration using ML techniques (OECD 2020, Semantic Scholar 2020). The machine-readability of data available via CORD-19 is currently being tested, e.g. with a competition by Kaggle (Kaggle 2020) and by ongoing research.

“For research on the way the virus spreads and affects the human body, medical data (e.g. also on comorbidities of a COVID-19 infection), social data (e.g. affiliation to a certain age group) or mobility data can play a vital role. For example, a hospital in France is developing a decision support tool consisting of a map of the areas where the virus is likely to reappear in the surroundings, which can help health authorities in taking preventive measures to limit the spread of the pandemic. However, the project team does not have sufficient data at their disposal. Such data exists but is quite difficult to access, e.g. due to privacy considerations, but also due to logistical barriers (data holders expect revenue for providing access to data, different procedures to gain data access, lack of interoperability). Effective governance measures, such as access to data within secure data spaces, managed by trusted parties, and under clear and transparent conditions that include appropriate safeguards for the legitimate interests of all stakeholders involved, would be vital to make important scientific progress”(Data

Governance Working Group A Framework Paper for GPAI's work on Data Governance 2020).

3.AI Across Spectrums

AI is currently attracting the attention of IR scholars, governments, ministries, diplomats and policy makers. Areas of foreign policy include ethics, economic turmoil, and security. With the advent of AI, foreign policy is changing rapidly as countries turn more and more to algorithms to predict geopolitical and economic scenarios are used to analyze world leaders and make social and political predictions.

Countries like China, for example, are applying AI and machine learning to foreign policy and other government policies. China has launched AI tools for foreign policy and a new generation plan to become the world leader in AI by 2030. Politicians, researchers, and bureaucrats are already using AI in their daily activities. In 2019, U.S. President Donald Trump signed an executive order establishing the U.S. AI Initiative, which joins other major nations in pursuing a national strategy for AI development. American diplomats are using the potential of AI technology to make policy changes, raise awareness and increase transparency.

On a diplomatic front, linguistic barriers can be can be abridged between countries through language processing algorithm allowing them to communicate effectively with the foreign governments and ambassadors.

Data mining can be used to simplify political forecasting and improve knowledge and forecasting of political, economic and social trends. AI helps negotiate, analyses past negotiations, and predicts the outcome of ongoing conversations. AI technology can support election monitoring and peacekeeping operations, thus enhancing international humanitarian efforts. AI anomaly detection can also protect grant transfers from inconsistencies.

Artificial intelligence can also carry out efforts to improve the quality of life in countries in need by increasing manufacturing, healthcare and other economic benefits. In situations where an earthquake, disaster, or other large-scale emergency occurs and requires international assistance, AI and related technologies can be of great help.

In India, the use of AI in diplomatic procedures such as reporting, consular services, communications and negotiations is limited. However, the potential

is so great that it cannot be ignored, at least in terms of public relations and consular affairs.

So far, we have seen the positive aspects of AI in foreign policy, but that does not mean that there are no risks associated with AI. This is fraught with risks, and even at the initial stage there are differences in technological progress and adoption rates from country to country. In such cases, it becomes clear that it is important for companies, foundations and governments to engage and fund the development and implementation of AI systems in countries where technological intervention is urgently needed for humanitarian purposes.

4. Techno-optimism in India

Prior work in HCI and ICTD has studied the discourses around technology in India, and how it has been frequently tied with notions of development (Joyojeet Pal 2012) The last two decades, in particular, have been crucial in shaping technology as the means for prosperity in India. Digital technologies are viewed as a vehicle for progress, as a solution to societal problems in developing countries .(Eric Brewer, Michael Demmer, Bowei Du, Melissa Ho, Matthew Kam, Sergiu Nedeveschi, Joyojeet Pal, Rabin Patra, Sonesh Surana, and Kevin Fall 2005)

The following is an excerpt from Prime Minister's speech in 2018 (Narendra Modi. 2018): “Can Artificial Intelligence help us detect serious health conditions before they manifest physically? Can Artificial Intelligence help our farmers make the right decisions regarding weather, crop and sowing cycle? Friends, our Government is of the firm belief, that we can use this power of twenty-first century technology [AI] to eradicate poverty and disease. In doing so, we can bring prosperity to our poor and under-privileged sections. We are committed to achieving this vision.”

The Indian government's vision for technological development manifested through two major initiatives over the recent years. First, the introduction of Aadhaar— a biometric identification system for 1.3 billion citizens, which was legitimized through a promise for poverty reduction and financial inclusion (Janaki Srinivasan and Aditya Johri 2013). Secondly BHIM, an application for digital payments introduced soon after demonetization as the future for cashless payments (Joyojeet Pal, Priyank Chandra, Vaishnav Kameswaran, Aakanksha Parameshwar, Sneha Joshi, and Aditya Johri 2018) Technology played a symbolic and functional role in enabling the ‘leapfrogging’ into the modern era. Bozarth and Pal(Lia Bozarth and Joyojeet Pal 2019) examine the social media (Twitter)

discourse, and find that politicians have an inclination to discuss technology in connection with development as part of their political messaging. Public discourse around technology and AI has been hyper-optimistic from the general public, the tech industry, and the government (Joyjeet Pal 2017) with several deployments underway (Ministry of Electronics & Information Technology 2020). Sambasivan *et al.* (Nithya Sambasivan, Erin Arnesen, Ben Hutchinson, Tulsee Doshi, and Vinodkumar Prabhakaran 2021) extensively report the ways in which a straightforward porting of responsible AI tenets can be inadequate and often harmful. How might we involve users with optimistic views about AI into algorithmic audits? Certainly, their perspectives would be valuable contributions in surfacing biased outcomes. Empowering users to interrogate these systems might be an approach to calibrate AI authority towards an appropriate level. Future work might investigate how we could leverage existing capacities in users that have high confidence in AI to acknowledge bias. This could benefit platforms in two ways: visibilising bias and mitigating harm, but also through building alternative, realistic narratives about AI that are better aligned with the capabilities of the system (Shivani Kapania, Oliver Siy, Gabe Clapper Azhagu Meena SP and Nithya Sambasivan 2022).

5.Global Data Governance

India calls on GPAI member states to work on a common framework for AI

“The Union Minister of State for Electronics and Information Technology, Rajeev Chandrasekhar highlighted that India will act as a “significant pole” in the Artificial Intelligence universe. India has called upon the global community to work for building a common framework for data governance, building safety and ensuring trust around the arena of AI. The minister went on to highlight the present and future trajectory of India's digital leadership journey and how the government is taking AI to the masses. He also talked about the development and implementation of policies in the world of artificial intelligence. He referred to ChatGPT, which is an artificial intelligence chatbot developed by OpenAI, and stated that the world is at a nascent stage of AI. The minister said that bias constitutes as a major problem in AI, and ChatGPT proves that "occasionally." He noted that India is working on positioning its programme as one of the bias-free and diverse in the world. "We are at the beginning of the race today, we are at the

starting line, but certainly we will be in the leading pack in terms of shaping the future of AI, applications, and use cases of AI that will benefit the citizens," said Chandrasekhar as he talked of India's prospects despite the United States and China being leading leaders currently" (WION News).

6.How can India overcome the challenges posed by AI?

Develop a clear and comprehensive regulatory framework that defines the purpose, scope, and principles of general AI regulation. This framework must strike a balance between protecting individuals from potential harm and promoting innovation and economic growth.

Develop an accurate and fair accountability framework that assigns accountability and accountability for the actions and outcomes of innovative AI systems. The framework should take into account the roles and obligations of different stakeholders, such as developers, vendors, users, and regulators. Integrate essential legal aspects such as transparency, accountability, privacy, security, ethics, and human oversight. These aspects must ensure that the general AI systems are trustworthy, trustworthy, and respectful of human rights and values.

Invest in research and development of generalized AI technologies capable of addressing India's specific needs and challenges. India is expected to leverage its strengths in data science, engineering and entrepreneurship to create innovative solutions for different industries and sectors.

Promote collaboration and cooperation between different stakeholders, such as government, industry, academia, civil society and international partners. India should engage in dialogue and exchange of best practices with other countries and regions that are at the forefront of AI development and regulation.

7.India's Tech Transformation

In terms of technological discourse, it has always been oxymoronic for India. The country has been able to develop advanced digital computers and highly advanced and cost-effective space programmes yet has lagged in its digital transformation and accessibility.

- **The Unique Identification Authority of India and its Aadhar programme*:** Aadhar is currently the largest biometric identification system in the world. It is a unique 12-digit identification number that Indian citizens and resident foreign nationals can receive based on their biometrics and demographics. One of its primary uses is streamlining direct benefit schemes where benefits are transferred directly to a bank account linked to Aadhaar. Today, Aadhar also serves as the primary identity proof in India.
- **The Unified Payments Interface(UPI)*:** Unified Payments Interface (UPI) is a mobile-based instant payment tool developed by Government of India to facilitate inter-bank peer-to-peer (P2P) and person-to-merchant (P2M) transactions. According to data of November 2022, UPI's monthly transactions touched 6 billion and a total value of Rs. 10 trillion among its 260 million users.
- **The CoWIN Platform*:** CoWIN, or the Covid Vaccine Intelligence Network, is the official web portal of the Indian government for COVID-19 vaccination registration. It displays the available slots for the COVID-19 vaccine available in the vicinity. The users can book various time slots as available on the website and obtain vaccination certificates, which serve as "Vaccine Passports" during the COVID-19 pandemic and can be stored in Digilocker.
- **DigiLocker*:** DigiLocker is an Indian online service provided by the Ministry of Electronics and Information Technology (MeitY) under the Digital India initiative. Every Aadhaar holders are provided with a cloud storage account to store and access authentic documents/certificates such as driver's licenses, vehicle registration, and academic mark sheets in digital format from the certificates' original issuers. It also provides 1GB of storage space with each account to upload scanned copies of legacy documents.
- **UMANG*:** The Unified Mobile Application for New-age Governance (UMANG) app is yet another MeitY initiative that provides users with the access to central and state government services. The app is for Indian citizens and offers hundreds of services, including payment, registration, information search and application forms.

Numerous forecasts suggest AI will add USD 967 billion to India's economy by 2035 and USD 450–500 billion to its GDP by 2025. This will account for 10% of the country's USD 5 trillion GDP target, making it a crucial tool for economic growth.

8. Building 'AI for All'

India has begun its AI journey in tandem with its core principles of social empowerment and inclusion. Given the scalability, AI can solve numerous age-old problems that have plagued the country for decades. As major global economic powers such as US and China are engaged in an "arms race" to become AI Superpower, India has scrupulously focused on inclusion and empowerment through its programme called "AI for All". (Jibu Elias 2023)

In the last couple of years, India's public and private sectors have produced AI-powered tools aimed at improving the delivery of health and safety services, affecting the lives of millions. These include:

- **The MyGov Corona Helpdesk (by MeitY).** During the peak of the pandemic, social media was flooded with misinformation and fake news about the COVID pandemic. This is when the country's citizen engagement platform, MyGov, the Ministry of Health and the AI startup Haptik launched MyGov Corona Helpdesk chatbot. The goal of this chatbot is to bring awareness to COVID-19 and prepare India's fight against it. (Jibu Elias 2023)
- **'e-Paarvai' is an initiative by the Tamil Nadu State Government.** It has been developed to cater to the paucity of ophthalmologists. It is an intelligent AI-powered mobile application that detects cataracts. (Jibu Elias 2023)
- **"Uzhavan"** of Tamil Nadu State Government. The application "Uzhavan" helps farmers to diagnose pest infestation in their crops and provide remedial measures. Farmers can click on images of pest-infested crops even with a cheap mobile camera and upload the images to the Uzhavan app. Once the photo is uploaded, the built-in smart system analyzes and identifies the pest and sends corrective actions as a text message to the farmer's phone in the local language, Tamil. (Jibu Elias 2023)

- **Realtime Digital Authentication of Identity system by Telangana State Government.** The Telangana State Government has implemented Real-Time Digital Identity Authentication (RTDAI) to authenticate pensioners during the COVID pandemic. Recipients must take a photo and upload it to an image verification app using artificial intelligence-based viability, big data and machine learning demographics testing solutions, and comparison solutions. image comparison based on deep learning. AI, ML, and deep learning solutions quickly verify user-submitted details using information accumulated in public data systems. (Jibu Elias 2023)
- **Crowd Estimation and Management tool by Telangana State Government.** Telangana Police successfully used Crowd Estimation and Management tool for crowd management during India vs West Indies T20 match in Hyderabad in 2019 and Medaram Jatara Festival in 2020. (Jibu Elias 2023)

On similar lines, the Ministry of Electronics and IT has launched various initiatives focused on taking advantage of the “AI revolution” in the coming years:

- India AI, the national AI portal
- The YUVAi programme for skilling students from government schools
- The soon-to-be-implemented National Programme on Artificial Intelligence
- National Semiconductor Mission
- National Data Governance Framework Policy
- New Digital Personal Data Protection Bill

Table 1:AI Initiatives by different departments of Central Govt.

Department of Central Govt.	Name of Initiative	Key Objective	Field
Ministry of Electronics and Information Technology	Responsible AI for Youth	To create a young force for future which understands the basics of	Educational, Learning training

		AI by reaching out to students at school level	
Ministry of Housing and Urban Affairs	Monitor e-measurement book (MB)	To develop a meticulous error free fair and transparent system of tendering and management of smart cities, parks and public facilities.	Housing
Department of Space / ISRO	Chandrayaan 2: AI-Rover	A robotic vehicle powered with AI tools which acted as rover in the launch vehicle of Chandrayaan-2 spacecraft as part of second lunar mission.	Space, Robotics
Ministry of Commerce and Industry	MoU for India-UAE Artificial Intelligence Bridge	A joint working group to reap the benefits of new technologies like AI, blockchain,	Bilateral collaboration

		analytics for business and economic benefits.	
Ministry of Health and Family Welfare	Use of AI for public health	The data of diseases like cancer, diabetic retinopathy is being studied using AI for early detection and drug development	Healthcare, Medical Diagnosis, Policy Paper
Ministry of Agriculture	Drones to monitor crop and soil health	A project named "SENSAGRI-Sensor Based gathers data of farm fields using drones. This would help in assessing crops health, issues warning in advance, and facilitates compensation settlement in Crop Insurance.	Agritech, UAV

Ministry of Railways	Use of AI to prevent signal failures	A system has been developed with the help of AI to protect Railway Signal system failure in advance.	Transportation, Predictive Maintenance
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Table 2: Initiatives by State Governments in India

State	AI enabled Initiatives by State Government	Field / Technology
Tamil Nadu	Smart conversation assistant	Chatbot, Natural Language Processing
Uttar Pradesh	AI video surveillance platform	Video Analytics
Karnataka	Intelligent Visualization for Pollution Control	Environment
Haryana	Drones for monitoring illegal constructions	UAV Infrastructure Management Governance
Telangana	Use of AI in eye care screening	Healthcare, Medical Diagnosis
Maharashtra	MoU between Government of Maharashtra and World Economic Forum	Industry 4.0, Agriculture, Social Welfare

9.India's AI Startup Ecosystem

With the world witnessing rapid transformation with the emergence of AI, India too has established itself as an AI research and innovation powerhouse. “Since 2010, the country has ranked fourth largest producer of AI-relevant scholarly papers and 8th in the world regarding AI patents filed in 2020.”(Jubin Elias 2023). There are several unicorns that have come up harnessing AI technology. With the use of AI, there is an increased efficiency in the performance of tasks which results in operational efficiency and a better resource allocation.

Here are just a few of the hundreds of Indian start-ups building AI tools and products to address national and global socio-economic challenges:

- **Niramai** is an AI start-up that provides affordable and fast breast cancer screening at clinics in rural India, have developed a novel artificial intelligence-based medical device to detect breast cancer at a much earlier stage than traditional methods or self-examination. The solution is a low cost, accurate, automated, portable cancer screening tool that can be operated in any clinic. The imaging method is radiation free, non-touch, not painful and works for women of all ages. The core technology of our solution has been developed using our patented machine learning algorithms for reliable and accurate detection of breast cancer. This unique solution can be used as a cancer diagnosis test in hospitals, for regular preventive health checkups, and also for large scale screening in rural and semi-urban areas.(Niramai)
- **Cropin** is a global ag-ecosystem intelligence provider. Cropin's suite of products enables various stakeholders in the agri-ecosystem, including financial services providers, to adopt and drive digital strategy across their agricultural operations. Using cutting-edge technology like artificial intelligence, machine learning, and remote sensing, Cropin creates an intelligent, interconnected data platform. Cropin helps organizations digitize their operations from farm to fork and leverage near real-time farm data and actionable insights to make effective decisions.(CROPIN)
- **Aquaconnect** is a full-stack aquaculture inputs and outputs platform with embedded fintech, supported by a phygital distribution network. Founded in 2017, Aquaconnect works with fish farmers and shrimp farmers to improve farm productivity, financial access, and market linkage through intelligent technology solutions. Since its inception, Aquaconnect has been working to navigate the challenges in the aquaculture value chain through an integrated tech-driven approach. Aquaconnect is helping connect aquaculture farmers with stakeholders in the value chain, such as feed producers, farm equipment manufacturers, banks, insurers, importers,

processors, exporters, and certifying bodies. Aquaconnect has assisted over 60,000 farmers through its unique AI & GIS-powered advisory platform. Aquaconnect's data-enabled fintech solutions aim to bring transparency for BFSI stakeholders to engage with aquaculture farming communities efficiently.(crunchbase)

- **CogniAble** is a Machine learning-driven assistive technology for early detection and affordable treatment of Autism Spectrum Disorder. Founded by researchers and Scientists from IIT-Delhi, pediatricians, Psychologists and BCBA's from India and USA, CogniAble brings affordability, accessibility and high-quality management on Autism condition on your fingertips. It is an organization that is driven by artificial intelligence which helps in early detection and treatment of autism. The staff will assess the child and prepare an individualised education plan. A child-specific education plan is made which gives you a specific plan to advance on your child's skills. Regular training sessions are held and regular updates are taken into consideration.(CogniAble)
- **Betterhalf** is India's first and only matrimonial app without the direct involvement of parents. It is the fastest-growing matrimony app in India connecting hearts through AI technology on both IOS and Android for free. Betterhalf is a revolution in the matrimony industry. It is here to break the old approach of matchmaking apps in India with its advanced compatibility algorithm powered by AI.(CXOtoday News Desk)

“Language technology is one of the critical areas where the Indian government sees AI making a breakthrough. In India, hundreds of languages are spoken, which makes knowledge sharing, skilling and access to information a considerable challenge. According to Prime Minister Narendra Modi, Natural Language Processing (NLP) will strongly impact India's educational sector as we advance AI technology. He pointed out that advancements in NLP mean that e-courses can be developed in regional languages and dialects based on the New Educational Policy.India launched the National Language Translation Mission to make vernacular language translation systems that bring accessibility and opportunities to millions of citizens. In addition, the Ministry of Electronics and

IT (MeitY) recently announced its Bhashini programme to enable easy access to the Internet, digital services and more content for all Indians in their own languages. The country's Supreme Court now translates orders and ruling into vernacular languages such as Hindi, Tamil, Punjabi, Marathi, Malayalam, Bangla, Telegu, Kannada, and Urdu with the help of the Samantar AI tool developed by the Indian Institute of Technology- Madras. AI for Bharat, which aims at creating a language corpus for machine translation, is another notable initiative in the language space. At the same time, numerous startups such as Gnaani, Reverie, and Devanagiri have made powerful strides in addressing language challenges”(Jubin Elias 2023).

10.NPAI-National Programme on Artificial Intelligence

It is a flagship programme under the Ministry of Electronics and Information Technology to foster inclusion, innovation and adoption for making a social impact.

NPAI includes 6 pillars:

- AI in Governance
- AI IP & Innovation
- AI Compute & Systems
- Data for AI
- Skilling in AI
- AI Ethics & Governance

Under this programme the high value datasets of Public Sector are to be identified and put under Artificial Intelligence control framework. The framework will provide access to appropriate datasets from the public sector. It is being done to ensure safety of data and its accessibility. A centre for Artificial Intelligence is being set up to tap the data into various models. The 2018 budget authorized NITI Aayog to establish the National AI Agenda to guide research and development of new and emerging technologies.

The NITI discussion paper titled “National Artificial Intelligence Strategy” identified five areas of AI application to meet societal needs: Health, agriculture, education, smart cities and infrastructure, smart transportation and mobility.

- National Mission on Inter-Disciplinary Cyber Physical Systems (NM-ICPS): This is a program run by the Union of Ministry of Science & Technology & Earth Sciences. The 2019 budget is allocated Rs. 5 cores for the task.

• The "Artificial Intelligence Task Force for India's Economic Transformation" under the leadership of V Kamakoti has explored the possibility of leveraging AI for development in various fields. Main recommendations:

– Establishment of digital databases, markets and exchanges to ensure the availability of cross-industry information.

- Data Ombudsman: to resolve data issues and complaints.

- Ensure there is enough funding for R&D.

– Establishment of the National Inter-Ministerial Delegation on Artificial Intelligence for coordinating AI-related activities in India.

11.National Strategy On AI

The government has chosen to use technology for inclusive growth. Consistent with the choice was to identify technology applications or interventions which create societal impact by enabling access and reaping benefits of transformative technologies. Consequently, societally impactful sectors where private capital would have been suboptimal has been chosen as playing fields for AI in India. The framework was to identify these sectors using pragmatic and rooted in developmental needs of the nation. Therefore, those five sectors have been as biggest impact areas for the country.

The framework also includes three major pillars:

- Opportunity: The Economic Impact
- Greater Good: Social Development and Inclusive Growth
- AI Garage for 40% of the world

Opportunity: The Economic Impact

What we need to recognise is that AI is fast developing as a new factor of production augmenting the classical factors like labour and capital and it has the potential to break the physical limitations of capital and labour and drive exponential growth. Therefore, AI has a discontinuous and exponential impact on economic good.

Greater Good: Social Development and Inclusive Growth

The widespread and potential impact a technology has in a sector and its transformative on billions of Indians is another very important reference frame for identifying a particular use case.

AI Garage for 40% of the world

It is a bit future looking as it recognises the fact that fundamental research on AI in India is lagging and will continue to lag. NITI Aayog conceptualises India as the AI Garage of the world where certain use cases if it is solved in India can be replicated across similar nations and regions which would ,therefore, make India a hotbed of activities or use cases in AI which could be mass replicated and 40% of the humanity would be benefited from these applications.

The application of these principles led to the identification of Healthcare, Agriculture, Education, Smart Cities and Smart Mobility as potential impact areas. These areas have potential impact across the Indian population and each sector has unique challenges to be solved.

- **AI in Healthcare: Robotics and Internet of Medical Things**

If we look at healthcare, developed nations around the world spend more than 11% of their GDP on healthcare. US spends approx. 16.5% of GDP, Germany 11.7% of its GDP, France & Switzerland approx. 11% of their GDP while other EU countries around 10% of GDP, China 5% of GDP, Indonesia 3.17% of GDP on healthcare as of 2021. To set the context, the National Health Policy of 2017 has allocated a higher level of spend in terms of GDP on healthcare but still it is not enough to cater to the present problems. The endemic problems in healthcare in India is the fact that the quality of primary care is the point where we lag substantially across the world in terms of number of beds per 1000 Indians, number of doctors, nurses and other healthcare professionals per 1000 Indians. The second aspect is non-uniform care physical access continues to be a major barrier with glaring disparity between rural and urban population on primary healthcare infrastructure, affordability, inadequate health coverage with private expenditure accounting to 70% of healthcare costs. The National Health Policy aims to break it through structural changes in terms of preventive and higher allocation and investments in terms of preventive and primary care infrastructure, financial protection for secondary and tertiary care.

- **Agriculture-AI:** It has got immense potential. It can bring about food revolution and match up to the increased demand for food(global need to produce 50% more and cater to an additional 2 billion population by 2050).Through real time advisory in the improvement of crop yield, advanced detection of pest attacks and prediction of crop prices to inform best sowing practices.
- **AI in Education:**School education has seen substantial gains in gross enrolment ratios which has gone as high as 97% in elementary and 80% at secondary levels. However, low retention rates and poor learning outcomes eat away the gains of gross enrolment ratio. The quality of education has a significant impact on skill and human capital of the nation. For schools in remote areas there are no separate classrooms or teachers for different grades which is one major cause of poor learning outcomes. Lack of interactive pedagogy, ineffectual remedial learning and rote learning are a major roadblock to a child's learning capacity as it does not customized as per the child's need. Through adaptive learning tools, AI can assist the teachers in managing multi-grade classrooms by judging the learning events of individual students and allowing automated development of customized educational content to each child's learning ability. Interactive and intelligent tutoring system delivering learning materials adapted to child's proficiency level and pace of learning content.
- **Smart Mobility, including Transportation and Logistics:** Potential use cases in this area include fleet of autonomous vehicles for carpooling, semi-autonomous features such as driver assistance and forecasting engine monitoring and maintenance. Other areas where AI could impact include autonomous trucking and delivery, and better traffic management.

12.India's Role as the Chairman of GPAI

As New Delhi gears up for the G-20 summit, its role as the chairman of GPAI is equally significant. There are several key areas which have to focused upon in order to be established as an AI superpower. It is important to note here that India has been chosen as the chairman for the GPAI by outnumbering countries like USA and Canada. This clearly underlines the trust that the members of GPAI have on India.

12.1 Impact of AI on labour force*

According to the International Monetary Fund, technologies such as AI and machine learning pose significant threat to the labour market in the developing economies. AI automation can possibly disrupt the labour market by replacing rather than complementing the workforce. Moreover, the development of AI in developed economies would lead to a diversion of investment from the developing economies. According to studies some professions are more vulnerable than the others especially those that require more manual labour or cognitive work. As AI has begun replacing humans in manufacturing, transportation and customer service there is a greater risk of job losses for the concerned workforce. High skilled workers particularly those that have a good technical hand might see a rise in demand and significant pay rise. On the other hand, those with low skills might face the risk of job loss or displacement with a stagnant pay and fewer future prospects. This leads to a situation of “job polarisation” wherein there is a widened pay gap between the high skilled and low skilled workforce.

The Future of Work working group has focused on the use of AI at the workplace but it has not given any clear-cut solutions for the replacement of labour with AI and how it can be resolved. India can take the charge as it is one of the world’s largest economies with a massive workforce. It can formulate new labour laws and working standards to cope with the changing needs of the market. Given the rampant threat of job losses it can help by providing for safety nets for the working population that is on the verge of losing jobs.

12.2 Inclusive AI for the Global South*

There are only four countries of the global south in GPAI namely Argentina, Brazil, India, and Senegal of the 29 members of the GPAI. This means that Global South is underrepresented in GPAI much like the other global forums. India must take the lead by voicing the concerns of the global south nations and ensuring that these nations too get to reap the benefits of this technological shift. It needs to ensure that these countries do not fall prey to what is called “AI Colonialism”. Much of the discourse on the development of AI has been centred around the west particularly the Silicon Valley in the U.S.. But the data that is being gathered to advance studies on the technology is being gathered from the countries that have less advanced data privacy regulation. They have cheaper labour and thus have to bear the brunt of massive data collection. These countries lack the resources necessary to develop their own AI and are therefore

left to cope with AI not designed for them. On the other hand, countries with more power (former colonial powers) disproportionately reap the technology's economic benefits.

MIT Technology Review's new *AI Colonialism* examined the parallels between AI development and the colonial past. For instance, in South Africa the AI tools built on the extraction of people's behaviour and faces are reinforcing racial hierarchies and digital apartheid. In Venezuela, the AI firms have found a new way of exploiting the workers by paying less to desperate workers amid economic crisis.

Although the GPAI has expressed its interest to include more member countries from the global south by welcoming Argentina and Senegal at the 2022 Tokyo Summit. GPAI has still not taken any concrete steps in this direction. Global AI Governance is being shaped by the economically advanced nations of the Global North. Therefore, India must ensure that this does not continue to be the case in future as well.

12.3 Governance and responsible development of AI*

Software like ChatGPT has fuelled the discourse on the potential applications and limits of AI technology. This offers numerous benefits, but there are certain measures that need to be undertaken for digital safety. ChatGPT has been used to commit cybercrimes such as impersonation, data theft, and malware attacks. There have been several binding agreements on nuclear and space technology but when it comes to AI there is no concrete agreement on the same. India as the head of GPAI can lead for the establishment of such an agreement to limit the exploitation of this technology and ensure its safe and inclusive development. India should collaborate with like-minded partners like the US, Canada, and the EU. It has already taken a step in this direction at the Tokyo Summit of GPAI wherein it urged all the member nations to work on a common framework of rules and guidelines on data governance in order to build trust ensure safety of both the internet and AI.

* Prateek Tripathi 2023-India's chairmanship of the Global Partnership on AI

13. Conclusion

Artificial Intelligence has the capacity to alter the working of government of country or the entire world as a whole. It can help the governments in resource allocation, diverse data sets, shortage of experts, handling large datasets and making timely future predictions. It poses tremendous opportunities but not without caution. It has the potential to disrupt the entire global arena namely- education, jobs, healthcare, etc. It is important to note that with the advancement of AI there is a risk of job loss or fear of displacement among the workforce especially the developing world. Labour economists contend that AI development would not lead to elimination of certain jobs rather a change in the composition of jobs. New kind of cybercrimes involving the use of AI have begun to emerge. Therefore, there is an urgent need to formulate a common policy framework for AI Governance globally.

There are various challenges and opportunities for India as the chair of GPAI. How to tackle the changing landscape of the job market with the development of AI, voicing the concerns of the global south and initiating for common rules and guidelines on AI Governance that needs to be addressed.

Many countries like USA and China have come up with an AI policy. India too has come up with a National Strategy on AI to address developmental challenges in the 5 key areas- education, healthcare, agriculture, smart mobility including transportation and logistics. India has very scrupulously begun its AI journey with a program called “AI for All” with the purpose of development and social inclusion. Various initiatives by the Government of India and various state governments have been undertaken in the field of AI.

India in the GPAI has a significant role to play and to establish itself as an AI Power at the world level. AI like any other technology comes with its pros and cons and that it can be left without any regulation. Also, the fact that AI is not accessible by the global south nations which furthers the digital divide. India

can effectively touch upon the areas which have received little or no attention by the GPAI working group. India can initiate for framing rules and regulations for the working standards in the new tech world to accommodate the development of AI, voice concerns for the AI availability to the global south, inclusion and integration of global south in GPAI and vouch for common policy framework for AI Governance to address the ethical challenges posed by AI.

This way India can help make GPAI more inclusive and cooperation driven. It can help solve the global challenges effectively paving the way for an AI ready world.

14.References

- 1.GPAI- <https://gpai.ai/>
2. Sunil Kumar Srivastava, Government of India- Artificial Intelligence: way forward for India
- 3.Purdy, Mark and Daugherty Paul. Why Artificial Intelligence is the Future of Growth. Accenture. 2016
4. U.S. Government, Executive Office of the President, NSTC Committee on Technology. Preparing for the Future of artificial Intelligence. October 2016
- 5.U.S. Government, Executive Office of the President. Artificial Intelligence, Automation and the Economy. December 2016
- 6.House of Commons Science and Technology Committee. Robotics and Artificial Intelligence. September 2016.
- 7.State Council of China. New Generation artificial Intelligence Development Plan. State Council Document No. 35. July 2017
- 8.Government of South Korea, Ministry of Science, ICT and Future Planning. Mid-to Long-Term Master Plan Preparation for the Intelligent Information Society: Managing the Fourth Industrial Revolution. Policy Document. 2016
9. Benner, Tom. Singapore: A Smart Living Laboratory. Scientific American. 2017.
- 10.MeitY <https://www.meity.gov.in/emerging-technologies-division>

11. <https://www.reuters.com/article/us-amazon-com-jobs-automation-insight-idUSKCN1MK08G>(Reuters 2018)

12. All the Ways Hiring Algorithms Can Introduce Bias-Harvard Business Review 2019 by Miranda Bogen
<https://hbr.org/2019/05/all-the-ways-hiring-algorithms-can-introduce-bias>

13. Global Challenges to Public Health Care Systems during the COVID-19 Pandemic: A Review of Pandemic Measures and Problems

Roxana Filip, Roxana Gheorghita Puscaselu, Liliana Anchidin-Norocel, Mihai Dimian, and Wesley K. Savage <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9409667/>

14. Data Governance Working Group A Framework Paper for GPAI's work on Data Governance 2020 <https://gpai.ai/projects/data-governance/gpai-data-governance-work-framework-paper.pdf>

15. Why open science is critical to combatting COVID-19 OECD 2020
<https://www.oecd.org/coronavirus/policy-responses/why-open-science-is-critical-to-combatting-covid-19-cd6ab2f9/>

16. The COVID-19 Open Research Dataset (CORD-19)-Semantic Scholar 2020
<https://github.com/allenai/cord19>

17. COVID-19 Open Research Dataset Challenge (CORD-19)-Kaggle 2020
<https://www.kaggle.com/datasets/allen-institute-for-ai/CORD-19-research-challenge>

18. AI Across Borders: AI in Diplomacy, International Relations, and Humanitarian Efforts-INDIAai -<https://indiaai.gov.in/article/ai-across-borders-ai-in-diplomacy-international-relations-and-humanitarian-efforts>

19. Joyojeet Pal. 2012. The machine to aspire to: The computer in rural south India. <https://doi.org/10.5210/fm.v17i2.3733>

20. Eric Brewer, Michael Demmer, Bowei Du, Melissa Ho, Matthew Kam, Sergiu Nedeveschi, Joyojeet Pal, Rabin Patra, Sonesh Surana, and Kevin Fall. 2005. The case for technology in developing regions. *Computer* 38, 6 (2005), 25–38.

21. Narendra Modi. 2018. Make Artificial Intelligence in India, Make Artificial Intelligence Work for India: PM Modi. <https://www.narendramodi.in/prime-minister-narendra-modi-inaugurated-wadhvani-institute-of-artificial-intelligence-at-the-university-of-mumbai--538994>. (Accessed on 09/09/2021).

22. Janaki Srinivasan and Aditya Johri. 2013. Creating Machine Readable Men: Legitimizing the 'Aadhaar' Mega e-Infrastructure Project in India. In Proceedings of the Sixth International Conference on Information and Communication Technologies and Development: Full Papers

- Volume 1 (Cape Town, South Africa) (ICTD '13). Association for Computing Machinery, New York, NY, USA, 101–112. <https://doi.org/10.1145/2516604.2516625>
23. Joyojeet Pal, Priyank Chandra, Vaishnav Kameswaran, Aakanksha Parameshwar, Sneha Joshi, and Aditya Johri. 2018. Digital Payment and Its Discontents: Street Shops and the Indian Government's Push for Cashless Transactions. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, 1–13 <https://doi.org/10.1145/3173574.3173803>
24. Lia Bozarth and Joyojeet Pal. 2019. Twitter Discourse as a Lens into Politicians' Interest in Technology and Development. In Proceedings of the Tenth International Conference on Information and Communication Technologies and Development (Ahmedabad, India) (ICTD '19). Association for Computing Machinery, New York, NY, USA, Article 33, 5 pages <https://doi.org/10.1145/3287098.3287129>
25. Joyojeet Pal. 2017. The Technological Self in India: From Tech-Savvy Farmers to a Selfie-Tweeting Prime Minister. In Proceedings of the Ninth International Conference on Information and Communication Technologies and Development (Lahore, Pakistan) (ICTD '17). Association for Computing Machinery, New York, NY, USA, Article 11, 13 pages <https://doi.org/10.1145/3136560.3136583>
26. Ministry of Electronics & Information Technology. 2020. INDIAai. <https://indiaai.gov.in/>. (Accessed on 08/24/2021).
27. Nithya Sambasivan, Erin Arnesen, Ben Hutchinson, Tulsee Doshi, and Vinodkumar Prabhakaran. 2021. Re-Imagining Algorithmic Fairness in India and Beyond. In Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency (Virtual Event, Canada) (FAccT '21). Association for Computing Machinery, New York, NY, USA, 315–328 <https://doi.org/10.1145/3442188.3445896>
28. Shivani Kapania, Oliver Siy, Gabe Clapper Azhagu Meena SP and Nithya Sambasivan 2022 <https://dl.acm.org/doi/pdf/10.1145/3491102.3517533>
29. <https://www.wionews.com/technology/exclusive-india-will-be-significant-pole-in-universe-of-artificial-intelligence-says-rajeev-chandrasekhar-574828>
30. Jibu Elias 2023 AI for All: How India is carving its own path in the global AI race <https://oecd.ai/en/wonk/india>
31. Table 1 & Table 2: Poonam Mallik, Dr. Kavita and Kusum Singal- AI INITIATIVES BY INDIAN GOVERNMENT: JOURNEY TOWARDS BECOMING GLOBAL TECHNOLOGY LEADER September 2020 [Journal of Critical Reviews](#)
32. Niramai-<https://www.niramai.com/>
33. Cropin- <https://www.cropin.com/about>
34. Aquaconnect- <https://www.crunchbase.com/organization/aquaconnect-india>
35. CogniAble-<https://www.linkedin.com/company/cogniabile/?originalSubdomain=in>

36. Indian Startups Are Embracing AI Technology for Unprecedented Growth
<https://www.cxotoday.com/specials/indian-startups-are-embracing-ai-technology-for-unprecedented-growth/>
37. The National Program on AI- <https://indiaai.gov.in/national-ai>
38. National Program on Artificial Intelligence- <https://blog.nextias.com/national-programme-on-artificial-intelligence>
39. NITI Aayog. 2018. NationalStrategy-for-AI-Discussion-Paper.pdf. <https://indiaai.gov.in/documents/pdf/NationalStrategy-for-AI-Discussion-Paper.pdf>. (Accessed on 12/03/2021)
40. NITI Aayog. 2021. Responsible-AI-22022021.pdf. <https://www.niti.gov.in/sites/default/files/2021-02/Responsible-AI-22022021.pdf>. (Accessed on 12/03/2021).
41. Prateek Tripathi 2023-India's chairmanship of the Global Partnership on AI
<https://www.orfonline.org/expert-speak/indias-chairmanship-of-the-global-partnership-on-ai/>
42. Shimona Mohan- Emerging technology, emerging power: India in the age of AI
<https://www.orfonline.org/expert-speak/emerging-technology-emerging-power/>
43. Times of India-The impact of artificial intelligence on labour economics
<https://timesofindia.indiatimes.com/blogs/voices/the-impact-of-artificial-intelligence-on-labour-economics/>
44. The Economic Times- African tech startups take aim at AI 'colonialism'
https://economictimes.indiatimes.com/tech/technology/african-tech-startups-take-aim-at-ai-colonialism/articleshow/102562664.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cpps
t