YOJANA SUMMARY

ARTIFICIAL INTELLIGENCE

FEBRUARY 2024

- Artificial Intelligence (AI), stands as the greatest invention of our era; it will continue to be a kinetic enabler for our digital economy, with the potential to be more disruptive than the advent of the Internet.
- The AI landscape changed due to GPU advancements, stronger compute power, and the rise of large language models by DeepMind and OpenAI.
- While AI promises efficiency, concerns grow over its potential risks. The current debate revolves around how to harness AI's power while mitigating its negative impacts.

India's Approach

- India's approach towards AI was highlighted during the **Global Partnership on Artificial Intelligence (GPAI) Summit 2023**.
  - The summit, hosted by India, was a significant international event focusing on AI.

- **AI for People's welfare & creation of an inclusive AI**
  - During the summit, PM Modi stressed India's dedication to using AI for people's welfare and ensuring Global South's inclusion.
  - He also pledged to create a safe regulatory framework and foster international collaboration for AI's widespread, trustworthy use.
  - Also, there is a call for a global governance framework addressing the safety and trust of AI.
- **Creating fine balance between market led innovation & regulation**
  - India's strategy involves establishing principles and a detailed list of harms and crimes related to AI.
  - Rather than regulating AI at certain stages of development, India suggests clear guidelines for platforms, tackling problems such as bias and misuse during model training.
  - The framework proposes rules against certain actions, with legal penalties for those who don't follow them.
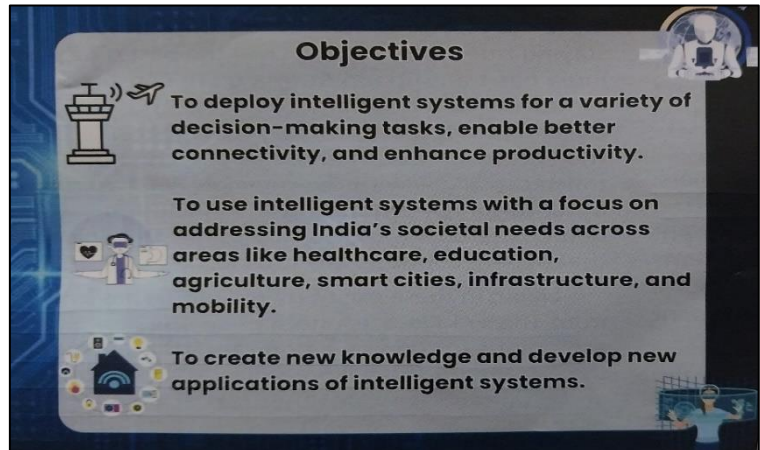
The 'India Techade' Vision

- In the vision of 'India Techade', technology plays a key role as a catalyst in making India the fastest-growing innovation economy in the world.
- The digital economy is poised to contribute a substantial 20% to the GDP by 2026, marking a significant surge from the current 11%.
- At the forefront of this transformative journey is the pivotal role played by AI, a force that the government is actively shaping through the **comprehensive mission named 'IndiaAI**.

IndiaAI

- IndiaAI's vision not only consists of support for the AI startup ecosystem but also the development of practical applications addressing real-world challenges in healthcare, agriculture, language translation, governance, and beyond.
- With a dedicated focus on AI research, the mission aims to create infrastructure for AI computation and curating high-quality, diverse datasets crucial for honing Indian models.
- Central to the growth and success of IndiaAI lies talent development, an aspect where India already stands out on the global stage.

o A recent report from Stanford University's AI index underscores India's leadership in skill penetration in AI, even surpassing the United States.

India's Datasets Programme

- Being the world's largest connected democracy, our nation, through rapid digitalisation has generated unparalleled volumes and varieties of data.
- In this context, India's datasets programme is shaping up to be one of the world's most extensive and diverse collections, promising substantial advantages for both our research and startup ecosystems.

GPAI Summit 2023 New Delhi - A Landmark in Global AI Discourse

- The summit underscored 3 key pillars: *Inclusion, Collaborative AI, and Safe & Trusted AI*.
- A novel framework, led by India, is challenging the conventional divide between market-driven innovation and the European model prioritizing citizens' rights protection.
- This emerging approach represents a departure from traditional paradigms and underscores India's innovative role in shaping global policies.
- India is leading a new approach that encourages innovation while also making sure it is safe and trustworthy.
  - o In the past two years, India has worked on rules and laws, like IT regulations, to create this framework for the digital economy.
- This safety and trust framework, where platforms, including AI platforms, have responsibilities, gained global acceptance at the GPAI Summit in New Delhi.

Conclusion

- India has evolved from the Fragile 5 economies to the Top 5, with aspirations to soon be among the Top 3.
- Achieving the status of a trillion-dollar digital economy and standing among the top innovators and digital economies is well within reach, marking a momentous chapter for India on the global stage.

AI IN INDIAN GOVERNANCE AND PUBLIC SERVICES

India's Experience In Digital Transformation & AI

- In the past decade, India has formulated a distinctive approach to digital transformation through the 'Digital India' programme.
- **Prioritising inclusivity and accessibility**, the India Stack projects on *digital identity (Aadhaar), digital payments (UPI), and Digilocker*, among others, have helped drive the digital transformation.
- Given this background, India is strategically poised to employ AI to transform public service delivery for efficiency in governance, innovation, and improved citizen engagement.

Opportunities In AI

- A recent industry report focusing on Generative AI (GenAI) suggests that GenAI holds the potential to contribute up to 1.5 trillion dollars to India's GDP by 2030.
- The **Stanford AI Index 2023** also ranks the nation as the foremost country in AI skill penetration.
- The growing AI landscape in India is further exemplified by a robust startup ecosystem, ranking 5th in the number of newly Funded AI Companies by geographic area.

India's Approach Towards AI

- India has taken steps to encourage the **domestic adoption of AI in a responsible manner and build public trust** in the use of this technology, placing the idea of *'AI for All' at its very core*.
- The Government of India's flagship initiative, the ***National Programme on Artificial Intelligence (NPAI)***, aims to nurture the building blocks of the domestic AI ecosystem through four key interventions:

- National Data Management Office (NDMO): NDMO aims to enhance data quality, utilisation, and accessibility, modernising government practices to fully unlock the potential of data and the AI innovation ecosystem.
- National Centre on AI (NCAI): NCAI identifies AI solutions for public sector problem statements and facilitates their nationwide deployment, aiming to drive large-scale socio-economic transformation.
- Skilling for AI: This pillar aims to revamp technical education infrastructure, particularly ITIs and polytechnics.
- Responsible AI: Emphasises the need to address potential biases and discrimination in AI adoption through the development of indigenous tools, guidelines, frameworks etc., and suitable governance mechanisms.

AI for Data-Driven Governance and Inclusive Development

- The integration of AI technology facilitates evidence-based decision-making, offering access to comprehensive data insights for more targeted socio-economic benefits.
- It enhances data analysis, automates tasks, and streamlines decision-making, fostering efficiency, innovation, and citizen engagement across sectors.
- This transition toward data-driven governance also promotes transparency and participatory governance.
- Moreover, AI catalyses inclusive development, breaking traditional barriers and driving large-scale social transformation.

Key Government Initiatives Leveraging AI

- **UMANG (Unified Mobile Application for New- Age Governance)**
  - UMANG serves as a unified platform, offering all Indian citizens a singular point of access to pan-India e-government services.
    - The platform provides access to 1836 vital government services.
  - To eliminate technology and language barriers AI was leveraged to transform UMANG into a more inclusive solution.
  - It has introduced a voice-based chatbot, or virtual assistant. Developed using conversational AI technologies.
    - This chatbot enables users to inquire about various Government services in both Hindi and English using either voice or text inputs.
- **DigiYatra**
  - DigiYatra is a biometric-based boarding system for Indian airports. This initiative eliminates the need for passengers to present their boarding pass or identification at multiple checkpoints, significantly reducing queuing time.
  - The security measures are strengthened through a system that maps each passenger to their Passenger Name Record (PNR), ensuring that only legitimate passengers gain entry at every checkpoint.
  - Moreover, the real-time information on passenger load obtained by the airport operator facilitates improved resource planning.
- **Digital India Bhashini**
  - Digital India **Bhashini (National Language Translation Mission)** is an initiative launched by the Ministry of Electronics and Information Technology.
  - It is building speech-to-speech machine translation systems for various Indian languages and dialects and evolving a Unified Language Interface (ULI).
  - This will enable citizens to access digital services in their own language, further increasing - digital inclusion and accessibility.

- o Bhashini uses AI for language and speaker identification, speech-to-text conversion, translation, transliteration, semantic comprehension, and speech synthesis, offering options for preferred speaker gender and language output.
  - o <u>Bhashini has also enabled voice-based UPI transactions.</u>

Applications of AI in Urban Governance

- Several government departments across States- including municipal corporations and police, are <u>using image recognition and AI for near-real-time monitoring of traffic and the infrastructure of the city</u>.
- It detects and report issues such as potholes, damaged manhole covers, non- functional traffic lights, and streetlights.
- The model is also trained to detect traffic infractions, including over speeding, rash driving, failure to wear a seatbelt, and issues such as broken taillights or headlights.

Applications of AI in Health Care

- DRDO's Centre for Artificial Intelligence and Robotics (CAIR) introduced ATMAN AI, an app for Covid detection via Chest X-rays.
- Ministry of Health employs AI models for TB and breast cancer detection in rural areas, mitigating radiologist scarcity.

AI-Based Pest Management System

- CottonAce, an AI-driven early warning system, is aiding farmers in safeguarding their crops by offering timely, localised advice on pesticide application. Following the integration of this AI system, farmers have witnessed a significant 25 per cent increase in cotton crop yields.

AI Applications in Agriculture

- The Government of Telangana has deployed an AI solution that has the capability to leverage agricultural data and provide actionable inputs that can potentially increase crop yield.
- Another AI-based solution deploys sensors in crop fields that help estimate moisture content in the soil. Mapping it with weather data regarding rains and the stage a crop is in helps make predictions of the irrigation needed.
  - o It is estimated that this simple solution can save up to 42% of water for paddy.

AI-Based Attendance Monitoring (Shiksha Setu)

- The government of Assam has developed **'Shiksha Setu'** for recording the digital attendance of both students and teachers. The application includes an AI-based facial recognition attendance system.
- The system has also identified and removed 4 lakh ghost students. This has resulted in significant cost savings for the Government in PM Poshan, school uniforms, and textbook supplies.

Conclusion

- India emphasizes ethical guidelines for AI in citizen-centric services, preparing to enact the National Data Governance Policy.
- As a key player in AI globally, India advocates for inclusive AI discourse, highlighted in the GPAI Summit where 29 countries, including the EU, signed the Ministerial Declaration.
- This aligns with the G7's Hiroshima AI Process, Bletchley Declaration, and G20 New Delhi Leaders' Declaration, stressing global cooperation for trustworthy AI benefiting all.

INDIA'S TECH SERVICES INDUSTRY - HARNESSING GENERATIVE AI FOR SCALABLE, SECURE, AND HUMAN-CENTRIC SOLUTIONS

- According to a study with McKinsey, worldwide, Generative AI is estimated to yield an annual economic value of USD 2.6 to USD 4.4 trillion.

- Most of this value is likely to emerge from a few functions and industries that form the core of the Indian technology services industry.

Potential Areas of Opportunity for the Industry

1. **Expansion in the Addressable Market:** Generative AI is poised to drive considerable market expansion in the next 5 years. This expansion includes new services and offerings that align with the evolving needs of the industry.
2. **Delivery Excellence:** The efficiency of service delivery processes is set to improve significantly.
3. **Sales Excellence:** Generative AI will streamline the entire sales lifecycle, from lead generation to sales strategy formulation.
4. **Productivity Gains:** In internal enabling processes like finance, legal, and HR, Generative AI can automate time-consuming tasks.

India's Unique Position in the AI Landscape

- India leads in inclusive and secure digital transformation with a grassroots-first approach, ensuring economic growth and digital inclusion at every level.
- As India embraces the AI era, it prioritizes opportunity and impact-oriented development, viewing AI as a tool for advancement while embedding safety and inclusivity in its design principles.

Addressing AI Security and Ethical Considerations

- As AI systems become more advanced ensuring their security and ethical use is paramount.
- Indian tech industry invests in secure AI development, data protection, and ethical guidelines to safeguard against malicious attacks, ensure privacy, prevent bias, and maintain transparency and human control.

Human-Centric AI: A Core Focus

- Algorithms must be thoroughly tested for unintended consequences and biases before deployment.
- Scrutinising data for implicit biases is crucial to preventing harm and distortion in outcomes.
- **Regulation is a shared responsibility**. Hence, Industry self-regulation, emphasising transparency and accountability, is as crucial as national and international regulatory frameworks.

Conclusion

Generative AI emerges as a transformative force in India's tech sector, vital for GDP growth and job creation. Early adopters stand to lead in innovation and set global standards for ethical and effective Generative AI use.

UNLOCKING THE POTENTIAL AND CHALLENGES OF GENERATIVE AI

- Since ChatGPT's release, Artificial Intelligence (AI) specifically **Generative AI** has caught the attention of many governments, corporations, and businesses. As per various reports, the market for Generative AI is likely to double every two years in the coming decade.
  - Generative AI is a type of artificial intelligence technology that can produce various types of content, including text, imagery, and audio.

AI, Machine Learning, Deep Learning

- AI involves creating intelligent agents capable of reasoning, learning, and autonomous action, aiming to mimic human thought and behaviour.
- **Machine learning**, a subset of AI, trains models using available data from sources like webpages and books, enabling accurate predictions for new or unfamiliar data.
- **Deep learning** is a type of machine learning that uses artificial neural networks, allowing them to process more complex patterns.
  - Artificial neural networks are inspired by the human brain. They are made up of many interconnected neurons that can learn to perform tasks by processing data and making predictions.

- **Generative AI** is a subset of deep learning, which means it uses artificial neural networks and can process labelled data using supervised learning methods.
- ChatGPT has been trained on a large collection of web pages, books, and articles. This large-scale supervised learning technology is termed the **Large Language Model (LLM)**.
  - When one trains a very large AI system on hundreds of billions of words, one gets a Large Language Model that predicts answers to various questions that are prompted by it.
  - Other examples that use Generative AI include Bard, Bing Chat, and Dall-E.

Concerns about AI

- **Gender-Bias:** There's concern that AI, like LLMs, could magnify human biases as they're trained on internet text reflecting both positive and negative human traits, including prejudices and misconceptions.
- **Job Losses:** A second major concern is who will be able to make a living when AI can do our jobs faster and cheaper than any human can?
- **Hallucinations and Misinformation:** Another concern is that it can sometimes 'hallucinate' inaccurate information with complete confidence. It can even invent its own references, sources, and deep fakes that are non-existent.
- **Plagiarised Content:** LLMs sometimes output plagiarised content.

Key Dimensions of Responsible AI

- **Fairness** of information to ensure that AI doesn't perpetuate or amplify gender biases.
- **Transparency** of information is vital to ensuring ethical decision-making.
- **Privacy** is another dimension for implementing responsible AI by protecting user data and ensuring confidentiality.
- **Safeguarding** the AI systems from malicious attacks.
- **Ethical use** of data, ensuring that AI is used only for beneficial purposes.
  - NITI Aayog publishes discussion papers on **'Responsible AI for All',** presenting a unique framework for implementing AI responsibly.
  - A checklist for brainstorming could be the five dimensions of fairness, transparency, privacy, security, and ethical use.

Conclusion

Generative AI has the potential to give society intelligent guidance on how to approach some of the biggest problems, like climate change and pandemics. In the coming times, AI will contribute to longer, healthier, and more fulfilling lives worldwide if used responsibly.

USE CASES OF GENERATIVE ARTIFICIAL INTELLIGENCE IN GOVERNANCE

- AI's intelligence lies in problem-solving through reasoning, learning, and mimicking human functions. Newer AI models like deep learning, reinforcement learning, and federated learning are gaining industrial importance.
- An extension of these AI algorithms is Generative Artificial Intelligence (GAI). GAI operates on Large Language Models, which have been trained on much larger datasets.
- Despite potential benefits, concerns about the socio-economic impacts of rapidly evolving AI persist.

Opportunities Presented by Generative Artificial Intelligence (GAI) in Government

- **Enhanced Citizen Experience and Service Delivery Automation**
  - GAI enables automated internal processes and faster query resolutions for citizens.
  - Platforms for query resolutions offer transparency in service request statuses.
- **Improvements in Citizen Engagement Platforms**
  - GAI assists in creating communication documents for citizen engagement processes.

- o Tailored interactions post-engagement enhances user experience and foster longer-term associations.
- **Real-Time Analytical Reporting**
  - o GAI provides decision-makers with real-time insights by analyzing vast document streams processed by government departments.
  - o Facilitates faster and more efficient decision-making processes.
- **High-Quality Data Visualization**
  - o GAI generates high-quality visual outputs, simplifying comprehension of complex data from multiple sources.
- **Manpower Training and Language Automation**
  - o GAI enables training personnel through English prompts, automating tasks such as meeting notes, document abstracts, and email creation.
  - o Significantly reduces time spent on documentation and facilitates easy correction of grammatical errors.

Examples From Other Parts Of The World

- The governments of both the **United States and Singapore** have initiated the integration of ChatGPT into their administrative systems.
  - o The US FEMA employs AI for critical satellite imagery analysis to bolster disaster response and resource allocation.
  - o In Singapore, the Smart Nation initiative utilises AI to optimise traffic management, improving urban planning and public transportation.
- The government of Estonia has been piloting several AI-related initiatives. For example, it has tested machine learning software to match job seekers with employers, developed a machine vision AI solution for better traffic management, etc.

Challenges and Considerations in Generative Artificial Intelligence (GAI) Implementation

- **Veracity and Credibility of Outputs**
  - o GAI output credibility relies heavily on the quality of ingested data.
  - o Subjective prompts often result in unsatisfactory responses.
- **Data Exposure and Privacy**
  - o GAI usage necessitates careful exposure of organizational data to GAI systems to prevent breaches of internal information assurance protocols and data privacy.
- **Principles of FATE (Fairness, Accountability, Transparency, Ethics)**
  - o GAI systems must address FATE principles to ensure fairness, accountability, transparency, and ethical use.
- **Government Initiatives and Guidelines**
  - o New Zealand government extensively employs AI for citizen-centric policymaking, with advisory policies ensuring GAI application guidance without compromising governance.
  - o Advisory highlights avoiding GAI use for critical information and the need for automated and human surveillance to counter illegal content and misinformation, including the challenge of detecting deepfakes.

Way forward

- Governments must train their employees to use data effectively and make the most of GAI platforms for their work.
- Employees should learn how to handle data and use these advanced AI tools.

- Getting better skills through prompt engineering and partnering with universities can help employees adapt to the changing technology.

Conclusion

GAI, like other AI tools, could play an important and critical role in the digital transformation of governments and public sector undertakings. This technology will help governments to be nimbler and more agile in their decision-making and connect with stakeholders more effectively.

ARTIFICIAL INTELLIGENCE AND FUTURE OF MEDIA

- The media traditionally informs, educates, and entertains society. With evolving technology, various content generation and dissemination methods emerged, blurring the line between creators and consumers.
- While this offers greater accessibility, it bypasses traditional curation processes, posing challenges in information quality control.

AI in Modern Media

- Modern media, driven by AI algorithms, strive for full interactivity and visual appeal, diverging from traditional forms.
- This trend emphasizes personalized content delivery based on browsing history and available data, minimizing the need for human intervention in selecting interests or aggregators.
- AI-powered systems possess extensive information about individuals and subjects, enabling personalized services across various domains, including health, education, entertainment, and more.
- While **offering tailored experiences**, this trend may lead to individuals living in specialized compartments or amid chaos and uncertainty.

Media's Role in an AI-Driven Society

- In an era dominated by algorithms and AI technologies, the role of traditional media faces challenges. **With an overflow of information, news media struggle to remain relevant**.
- However, AI has empowered media houses with ML-based systems for fact-checking, cross-verification, and digital storytelling, surpassing human capabilities.

The Future of Journalism: AI-Powered News Production

- AI journalism utilizes automation to generate news stories swiftly by analysing vast data volumes through pattern recognition and specific algorithms.
- Data, algorithm, and automated journalism will be pivotal in future news production, offering media houses efficient and rapid content dissemination.
- AI-enabled data labelling enhances news post reliability and retrievability. Digital storytelling is evolving, with automated book publishing already underway.
- Tech-smart tools in publishing houses will become more influential. Pattern recognition, speech-to-text synthesis, content synthesis, and other AI innovations are revolutionizing visual arts, the movie industry, and media house audio-visual components.

Concerns

- Pattern recognition and facial recognition tools have impacted security and privacy issues.
- These AI tools are a long way from being certainties, and deepfakes are definitely the point in question.
- There are doubts, assumptions, concerns, issues, and problems across disciplines and areas of human endeavour.

Conclusion

- We have already entered the era of synthetic media. Augmented Reality and other tools are going to enrich this synthetic experience, almost bordering on a synesthetic experience.

- That augur well for the producers and consumers of expressions of all kinds.

TRANSFORMATIVE ROLE OF AI IN MEDIA

"The functions of editor- in-chief, layout artist, proof-reader, publisher and photo editor will no longer exist in the future as we know them today" – Editor-in-chief of Blid

- In June 2023, Germany's largest tabloid Bild announced that it was laying off a third of its staff and their functions would be taken over by machines.
- Mathias Doepfner, the CEO of Axel Springer, the owner of Bild, claimed in an internal letter, "Artificial intelligence has the potential to make independent journalism better than it ever was - or simply replace it".

Impact of AI - Positive Transformation

- The powerful algorithms that power the AI can decipher data at a speed no human can match. This has been the harbinger of emergence of **Big Data Journalism**.
- Journalists can now successfully and speedily comb through mountains of data and decipher statistical patterns, using them to tell compelling and useful stories.
- Jobs involving analysing audience preferences, engagement, and improving SEO rankings are crucial in media organizations, highlighting AI's direct impact on the media landscape.
- The emergence of advanced large language models signifies AI's shift from the sidelines to the core of journalism, particularly in content creation.
- There are other newsroom tasks that are increasingly being taken over by AI. These include:
  o Content discovery; Document analysis; Translations (in multiple languages);
  o Social media content creation;
  o Automated writing (from structured data) e.g., school, college events, natural events, business, real estate and community calendars;
  o Automated writing (from unstructured data) e.g., obituaries, press briefs, event previews;
  o Newsletters (personalised with optimised delivery time); Text summarisation; Comment moderation;
  o Content transformation and reuse (format articles to enable reuse in different platforms, formats and platforms); Search Engine Optimisation.

Human Uniqueness in Media Amidst AI Advancements

- Despite AI's increasing presence in media, organizations remain cautious about allowing machines to dominate.
- Media's human-centric nature, including intrinsic qualities linked with journalism, poses challenges for AI replication.
- The complexity of human involvement in media sets it apart from complete AI dominance.
- There are many intrinsic qualities of human that are necessary for journalism and AI would find difficult to replicate. These are:
  o **Emotions** – AI - at least in its current iteration - runs on data and algorithm not emotions.
  o **Adaptability**
  o **Branding and Connect** – Journalists have spent years building a brand and it's almost impossible for AI to do that with no time and earn the audience's trust.
  o **Ethics** – AI is yet not programmed discern what is morally correct or acceptable.
    - There are more aspects to ethical concerns; AI can create fake images, video and audio.
    - It can be used to create deepfake content.

- If an AI algorithm works on data that is ridden with bias then the content produced would carry them forward.
  - o **Ground Connect** – Boots on the ground is what makes stories by reporters believable.
  - o **Limited Ability to Take Decisions** – AI is still limited in its ability to make decisions based on context.
  - o **Social and Environmental Consequences** – There is a rapid and unstudied dash to deploy AI in the media but chatbots consume vast amounts of energy - is it justifiable.

Conclusion

There is no denying that the human factor is an absolute essential for Media. The faith that democracies place in Media, makes it absolutely essential that the fourth pillar of Democracy - the Media is not transformed to the point that AI takes over newsrooms.

ROLE AND SCOPE OF ARTIFICIAL INTELLIGENCE FOR CITIZEN SERVICES

AI in the Digital India Initiative

- Integrating AI with Aadhaar-enabled services enhances efficiency and security while safeguarding individuals' identity privacy.
- Incorporating AI into DigiLocker fosters a digital, paperless ecosystem by improving document management.
- AI integration in government mobile apps creates intelligent, citizen-centric platforms, enhancing processes, service delivery, and communication between the government and citizens.

AI in Public Safety and Security

- Surveillance systems powered by AI can help in the early detection of potential risks.
- AI technologies, including facial recognition and video analytics, are employed for public safety and security.

AI in Healthcare Services

- AI revolutionizes healthcare services by offering diagnostic tools and personalized health recommendations.
- Remote monitoring and telehealth services supported by AI enhance healthcare accessibility.
- AI analyses medical imaging data like X-rays, MRIs, and CT scans, aiding in anomaly detection and disease diagnosis.
- Machine learning algorithms assist in drug discovery by identifying potential candidates from vast datasets.
- Virtual health assistants and chatbots powered by AI offer instant support, medical information, appointment scheduling, and medication reminders.
- AI enables remote patient monitoring, enhancing healthcare accessibility, especially in rural areas.
- It aids in robotic-assisted surgery and monitors mental health conditions by analysing behaviour and social media data.
- AI contributes to healthcare governance by predicting outbreaks, optimizing resource allocation, and supporting decision-making during crises like the Covid-19 pandemic, facilitating contact tracing and healthcare data analysis.

AI in Finance: Driving Inclusion and Security

- AI powers mobile banking, digital payments, and credit scoring for financial inclusion. Fraud detection algorithms monitor transactions, preventing fraud in real-time.
- AI utilizes non-traditional data for credit scoring, expanding access to financial services.
- Integration of AI with blockchain enhances security and transparency, fostering trust in financial systems, particularly in regions facing barriers to inclusion.

AI in Smart Agriculture

- AI analyses agricultural data to provide real-time insights on weather patterns, crop health, and farming practices, improving crop yields and resource optimization.
- Technologies like sensors, drones, and satellite imagery enable precision farming, allowing farmers to monitor soil conditions and weather patterns for targeted interventions.
- AI optimizes irrigation by analysing soil moisture levels and weather forecasts, ensuring efficient water usage and resource conservation through smart irrigation systems.

AI in Education and Skill Development

- AI facilitates personalized learning, adaptive assessments, and skill development in education.
- Virtual classrooms and online platforms leverage AI to cater to diverse learning needs and enhance access to education, crucial during events like the Covid-19 pandemic.
- AI technologies support remote learning initiatives, especially in underserved areas, and enhance educational content through gamification, making learning more engaging and interactive.

AI in Smart City Development

- AI technologies empower cities to improve efficiency, resource management, and overall comfort for residents. The Smart Cities Mission integrates AI and IoT to optimize urban living.
- AI analyses data from sensors and IoT devices to optimize infrastructure usage in areas like traffic, waste, energy, and water management.
- This leads to reduced congestion, energy savings, and efficient resource allocation.
- AI enhances waste collection and recycling by optimizing routes and identifying areas for recycling initiatives, promoting a circular economy and reducing environmental impact.

AI in Tourism

AI algorithms help users plan their trips by suggesting optimal itineraries based on preferences, budget constraints, and time constraints. AI analyses weather patterns and provides real-time travel alerts.

AI in Power Management

- AI algorithms analyse historical data, weather patterns, and other relevant factors to predict future energy demand accurately.
- AI helps optimise energy consumption in various applications, from industrial processes to residential buildings.
- Machine learning models can learn patterns of energy use and suggest strategies for minimising consumption during peak times.

AI in Logistic Management

- AI algorithms analyse historical and real-time data, considering factors like traffic conditions, weather, and road closures, to optimise delivery routes. This leads to reduced transit times, fuel consumption, and transportation costs.
- AI optimises air traffic management by predicting congestion, and assisting air traffic controllers in managing airspace more efficiently.
- AI helps to incorporate predictive infrastructure planning for the 'GatiShakti' Project.

AI in Automation of Routine Tasks

AI can automate repetitive and routine tasks in citizen services by reducing the workload on government employees.

AI in Customer Service and Interaction

These systems can operate 24/7, ensuring continuous availability and accessibility for citizens.

AI in Personalised Services

Personalised recommendations and notifications can be delivered to citizens, keeping them informed about relevant services and updates.

Conclusion

While AI offers numerous benefits, it's essential to address concerns related to privacy, bias, and ethical considerations when implementing these technologies in citizen services.

ARTIFICIAL INTELLIGENCE AND THE EASE OF LIFE FOR VISUALLY CHALLENGED

Around 250 million people on the globe are visually impaired. They are either struggling to have a decent or independent life.

Visually Challenged and AI

- **Detection of Impairment**
  - The life of a Visually Impaired (VI) can be improved right at the time of its diagnosis and locating the means for rehabilitation.
  - Early detection using AI assistive technology can invariably interfere with the medication or other management process right from the womb.
  - Regular examination for locating the blindness at the infant stage itself is now made possible by AIs.

- **Education**
  - AI-driven learning platforms offer interactive and customizable experiences tailored to individual learning needs, aiming for inclusivity and reduced tech-divide.
  - The Beijing Consensus provides guidelines for policymakers in this regard.
  - Virtual assistants like Siri, Alexa, and chatbots have transformed the learning ecosystem.

- **AI and Social Life**
  - Envision, a socially committed developer, has created AI-enabled spectacles designed for blind or low-vision individuals.
  - The device recognizes familiar faces and provides descriptions of strangers, enhancing psycho-social competence.
  - Additionally, digital magnifiers aid those with low vision in reading printed materials.

- **AI and Governance**
  - With the Unique Disability Identity cards in India, it can certainly reshape the entire landscape.
  - On all the platforms of public utility driven by AI, it will be easy to validate the individual's locus standi for an automated mode shift.

- **AI and Accessibility**
  - States are tasked with providing accessible environments for people with mobility challenges, including public buildings, transportation, financial institutions, and educational centres.
  - Artificial Intelligence can enhance security measures in these areas. AI cameras in public places can offer tailored assistance for visually impaired individuals.
  - This is seen in initiatives like Indian metro rail services providing clear audio communications for the visually impaired.

Conclusion

- AI has the potential to significantly impact the lives of marginalized individuals, including people with disabilities. From pregnancy to rehabilitation, AI can offer support and solutions. Breakthroughs like AI detecting diabetic retinopathy show promise.
  - Diabetic retinopathy is an eye disease that can occur in people with diabetes.
  - It's caused by high blood sugar, which damages the retina over time.

- Enhanced healthcare monitoring, governance, and affordable AI devices can improve the well-being of visually impaired individuals.
- AI-enabled gadgets promote inclusivity in digital governance, offering mode selection options with intelligent audio cues.

THE RISE OF INDIA'S DRONE INDUSTRY

- India is building an ecosystem to become a global drone hub by 2030.
- Drones played a crucial role during the Covid-19 pandemic, delivering vaccines and medicines, collecting samples, and enforcing lockdowns.
- They are poised to revolutionize education, agriculture, healthcare, weather forecasting, disaster management, and defense.
- With their agility, drones help reach inaccessible areas, expanding opportunities for governments and organizations.

Examples

- From **'Kisan Drones'** for crop assessment and spraying insecticides, to **'i-Drones'** to develop an ecosystem for healthcare drone deliveries, to drones being used for Kedarnath reconstruction and the Namami Gange Programme, they have already been ushered in for the country's overall development.
- **'PM SVAMITVA Yojana'** is an example of how drone technology is becoming the basis of a major revolution.
  - Under this scheme, for the first time, the country's villages are being digitally mapped, and digital property cards are being given to the people.

Support Extended By The Govt

- To support and promote **Drone-as-a-Service (DrAAS)** among emerging drone start-ups, Mission 'Drone Shakti' has been announced.
- Young minds are engaged in learning drone technology through the Atal Innovation Mission network (especially Atal Tinkering Labs).
- The introduction of the landmark **liberalised Drone Rules 2021** to promote and streamline the commercial and industrial use of drones through the **Digital Sky platform** is a testament to India's swift adoption of drones.
- The Government also launched a **PLI Scheme for drones** and drone components with a total incentive of Rs 120 crores.
- **Other Steps**
  - The publication of the **Drone Airspace Map 2021**, which opens nearly 90% of Indian airspace as a green zone up to 400 feet;
  - UAS Traffic Management policy framework 2021;
  - The **Drone Certification Scheme 2022** to simplify the process of obtaining type certificates for drone manufacturers;
  - The **Drone Import Policy 2022**, which bans the import of foreign-made drones; and
  - The setting up of drone schools to train pilots and providing licences for drone operations.

CYBER SECURITY CHALLENGES IN THE ERA OF AI

- India's digital landscape is rapidly evolving, with **internet users exceeding 800 million** and the government actively promoting digital initiatives like Aadhaar and Digital India.
- In 2023 alone, **India witnessed over 1 billion cyberattacks**.

Al-Powered Threats

- The integration of Al in cyber security presents both opportunities and vulnerabilities.
- On the one hand, Al can automate threat detection and response, analyse vast amounts of data to identify anomalies, and even predict future attacks.
- On the other hand, Al-powered tools can be manipulated by attackers to launch sophisticated cyberattacks, create deepfakes for social engineering, and automate malware development.

Unique Challenges for India

- **Large digital divide:** A significant portion of the population lacks access to digital literacy.
- **Fragmented cyber security infrastructure:** The responsibility for cyber security is often distributed across various government agencies and private entities, leading to a lack of coordination and comprehensive strategies.
- **Data privacy concerns**
- **Skill shortage**

Addressing the Challenges

- Building a robust cyber security ecosystem:
- Investing in Al-powered cyber security solutions:
- Promoting digital literacy and awareness:
- Developing a strong legal framework:
- Investing in cyber security training and skills development:

A Call to Action

- The collaboration of government, private sector, academia, and civil society is crucial for building a robust cyber security ecosystem and promoting responsible AI development.
- Ethical considerations such as transparency, accountability, and human oversight are necessary to prevent misuse and bias.
- International cooperation is essential for combating cyber threats through information sharing and expertise exchange.
- India can create a secure digital future by addressing vulnerabilities and leveraging opportunities in the era of AI.

PM-JANMAN: Empowering Tribals

- *Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan* (PM-JANMAN) is aimed towards the vision of Antyodaya to empower the last person at the last mile.
- This initiative is for the socio-economic welfare of Particularly Vulnerable Tribal Groups (PVTGs).
- PM-JANMAN aims to enhance the socio-economic conditions of PVTGs by providing essential facilities like safe housing, clean water, education, healthcare, electricity, and livelihood opportunities.
- It involves 11 key interventions across 9 Ministries to improve the well-being of PVTG households and settlements.
- There are 75 PVTGs across 18 States & UTs who are living in 22,544 villages (220 districts) with a population of around 28 lakhs.