Artificial Intelligence

For Prelims: Artificial Intelligence (AI), Ethical AI, Machine Learning, Large Language Models, Global Partnership on Artificial Intelligence, Artificial Intelligence Mission

For Mains: Boosting AI innovation and startups, Artificial Intelligence Technology.

Source: IE

Why in News?

The year 2023 has been a landmark year for Artificial Intelligence (AI) **innovation**, showcasing incredible advancements in various AI tools. These advancements offer a glimpse into the expanding potential of AI, particularly in creativity, conversation, and visual content generation.

- However, this surge in development emphasizes the **critical need for enhanced oversight to ensure** ethical AI use and equitable access to its benefits.

What is Artificial Intelligence?

- **About:**
  - AI is defined as the **ability of machines** and systems to **acquire and apply knowledge and to carry out intelligent behaviour.**
    - The term "Artificial Intelligence" was coined by **John McCarthy,** an American computer scientist and cognitive scientist. He was one of the founders of the discipline of AI.
  - It includes technologies like machine learning**,** Deep Learning**,** Big Data**,** Neural Networks, Computer vision, **Large Language Models** etc.
  - The ideal characteristic of artificial intelligence is its ability to rationalize and take actions that have the best chance of achieving a specific goal.
- **Types of AI:**

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Based on Capabilities	Description
Weak AI or Narrow AI	AI designed for specific tasks like playing chess, recognizing faces, or making recommendations. Examples include Siri, Watson, AlphaGo.
General AI	AI with the ability to perform any intellectual task that a human can, including reasoning, learning, and planning. No current examples, but researchers are working on it.
Super AI	Speculative AI that surpasses human intelligence, excelling in tasks with cognitive abilities like creativity, self-awareness, and emotion. No current examples, only future possibilities.

Based on Functionality	Description
Reactive Machines	AI that reacts to the current situation but lacks memory or past experience storage. Examples include Deep Blue, AlphaGo.
Limited Memory	AI that stores some data or past experience for a short time, using it for decision-making. Examples include self-driving cars, chatbots.
Theory of Mind	AI that understands and simulates the mental states, emotions, and beliefs of others. No current examples, research is ongoing.
Self-Aware	AI with a sense of self, consciousness, and self-reflection. No current examples, subject to philosophical and scientific debates.

- **Principles for the Ethical Use of AI:**
  - AI initiatives should align with established **ethical principles, human rights, and societal values** to ensure responsible technological advancement.
    - Prioritize the **positive impact of AI on individuals,** communities, and society, emphasizing responsible use for the greater good.
  - Design AI systems to be **transparent and explainable,** allowing users and stakeholders to understand operations and decision-making processes, **fostering trust and accountability.**
    - Mitigate **biases in AI algorithms to ensure fair outcomes,** preventing **discrimination** based on race, gender, ethnicity, or socioeconomic status.
  - Uphold **individuals'** privacy rights by responsibly handling **personal data**, obtaining **explicit consent**, and complying with relevant privacy laws and regulations.
  - Establish clear lines of **accountability for developers and organizations** deploying AI systems, with mechanisms to address errors or harmful impacts.
  - Develop and utilize AI technology to **enhance human well-being**, address societal challenges, and contribute positively to global progress, economies, and environmental sustainability.
- **Major AI Tools:**

Tool	Description
ChatGPT	OpenAI's powerful chatbot evolved with features, mobile versions, and integration with DALL-E 3. Challenges faced with internal upheaval.
Bing AI Chat/Microsoft Copilot	Microsoft's interactive search experience powered by GPT-4. Excels in coding assistance, travel planning, and language learning.
Runway Gen-2	Revolutionary AI video software by Runway, acclaimed for stunning visual effects in the film 'Everything Everywhere All at Once.'
DALL-E 3	OpenAI's third iteration generative AI model integrated with ChatGPT for brainstorming and prompt refinement. Content restrictions implemented.
Midjourney	AI tool popular for generating breathtaking images based on detailed text prompts, known for precise and photorealistic creations.
Pi Chatbot	Empathetic chatbot designed by Inflection AI as a supportive companion with real-time access to the latest information from the web.
Claude 2 by Anthropic	Anthropic's chatbot with a large context window for natural conversations, self-supervision learning, and assistance in various tasks.
Character AI	Engaging chatbot enabling conversations with AI versions of celebrities, historical figures, and fictional characters.
GitHub Copilot	GitHub's AI pair programmer providing contextual suggestions, real-time assistance, and adapting to the user's coding style.
Adobe Firefly	Creative powerhouse for AI image generation by Adobe, transforming textual prompts into stunning high-quality images. Currently free in beta.
Perplexity AI	Conversational AI search engine offering a chatbot-like interface, bridging creativity and knowledge with precise answers and sourced information.
Google Bard	AI chatbot with a massive dataset of code and text, capable of learning and understanding human language. Under development, offering a glimpse into the future of AI interactions.

- **India's Initiatives Related to Artificial Intelligence:**

- **INDIAai.**
- **Global Partnership on Artificial Intelligence (GPAI).**
- **US India Artificial Intelligence Initiative.**
- **Responsible Artificial Intelligence (AI) for Youth.**
- **Artificial Intelligence Research, Analytics and Knowledge Assimilation Platform.**
- **Artificial Intelligence Mission.**

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

Q. With the present state of development, Artificial Intelligence can effectively do which of the following? (2020)

1. Bring down electricity consumption in industrial units
2. Create meaningful short stories and songs
3. Disease diagnosis
4. Text-to-Speech Conversion
5. Wireless transmission of electrical energy

Select the correct answer using the code given below:

(a) 1, 2, 3 and 5 only
(b) 1, 3 and 4 only
(c) 2, 4 and 5 only
(d) 1, 2, 3, 4 and 5

Ans: (b)