

Q.1 Discuss the recent developments in Artificial Intelligence and its impact on various sectors such as healthcare, finance, and transportation.

Approach

Start with basic intro on AI and then highlight recent technologically prominent developments and different measures. Also write down different impacts on various sectors.

Introduction

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. Artificial Intelligence has the potential to provide sizeable incremental value to healthcare, finance and transportation sectors globally.

Body

Recent developments:

- The development of AlphaFold, an AI system that descended from AlphaGo, was originally a deep learning model trained to beat human beings at the board game Go.
- RAISE 2020 – 'Responsible AI for Social Empowerment 2020' was jointly organised by the NITI Aayog and the Ministry of Electronics and Information Technology (MeitY).
- Many countries have instituted dedicated public offices such as the Ministry of AI (UAE), and Office of AI and AI Council (U.K.) while China and Japan have allowed existing ministries to take up AI implementation in their sectoral areas.
- AI based face recognition opened a new window of opportunity to do predictive policing in India. With the help of AI, Delhi Hyderabad police predicted the pattern of crime, analyze lot of CCTV footage which are available across the city to identify suspects.
- The sheer velocity and magnitude of AI innovation have also led to impacts in fields such as commerce or digital healthcare.

Impact on Healthcare:

- AI plays an important role in the field of healthcare by addressing issues of high barriers particularly in rural areas that lack poor communication and a professional healthcare system.
- Some of the emerging application includes AI-driven diagnostics, personalized treatment, early identification of potential pandemics, and imaging diagnostics.
- Atomwise, a drug development company used AI to analyze if existing medicines could be redesigned to target the Ebola virus in 2016.

Transports, Logistics, and Smart Mobility:

- This domain mainly includes various autonomous and semi-autonomous features, for example, monitoring and maintaining a predictive engine along with driver-assist. Other applications of AI include improved traffic management, autonomous trucking, and delivery.
- Applications of AI is in the form of autonomous vehicles or self-driving vehicles were once a thing of pure science fiction but in recent years have been implemented with varying success it will impact number of employments in transport sector.
- For example, Tesla along with the likes of Uber, Waymo and Motional—has been working on automated vehicles for a number of years now, always staying one step ahead of the curve.

Impact on finance sector:

- AI is going to be future of financial sector as it brings the power of advanced data analytics to combat fraudulent transactions and improve compliance.
- AI is particularly helpful in corporate finance as it can better predict and assess loan risks. For companies looking to increase their value, AI technologies such as machine learning can help improve loan underwriting and reduce financial risk.
- Consumers are hungry for financial independence, and providing the ability to manage one's financial health is the driving force behind adoption of AI in personal finance.
- For example, AI based chatbot in banking different apps, a virtual assistant.

Conclusion

India may appear to be relatively well-positioned to take advantage of the disruption in the AI system through its advanced IT sector and large youth demographic potential to establish itself as the future hub for AI-related activities.

Q.2 Evaluate the role of government in regulating and promoting the use of blockchain technology in various industries.

Approach

Candidates can start the answer by basic definition of block chain and simply write about the regulation and role of government in promoting block chain.

Introduction

A blockchain is a form of public ledger, which is a series (or chain) of blocks on which transaction details are recorded and stored on a public database after suitable authentication and verification by the designated network participants. A public ledger can be viewed but cannot be controlled by any single user.

Body

Government's role in promoting:

- MeitY has prepared a draft framework for the use of blockchain technology in government services and intends to use it in the areas of property record keeping, digital certificates, power distribution, health records as well as supply chain management.
- Land records: Land transactions and proof-of-ownership requests can burden government agencies with documentation and administrative work. By promoting blockchain, governments can permanently store asset transactions such as land, property, and vehicles on a public ledger.
- Legal contracts: Traditional legal-contract execution is costly to both governments and their citizens. Smart, self-executing contracts, enabled by blockchain, can remove the need for intermediaries and potentially improve contract creation and execution. These contracts will be publicly accessible and secure within the network.
- Cyber space: Government systems that provide social benefits, such as unemployment, can be misused and infiltrated by certain individuals and groups, such as cyberattackers. Blockchain can improve record management and provide protection, though issues of privacy must be thoroughly addressed.
- Patenting: Since blockchain can permanently time-stamp transactions at any time, companies or individuals can file patents without enduring the cumbersome submission process.

Regulation of blockchain technology:

- The current debate in India has, unfortunately, focused too heavily on trading and speculation, looking at cryptocurrencies as an investment tool, rather than understanding the potential of core blockchain technology and the basic role of cryptocurrencies as an incentive mechanism to secure decentralized transactions.
- At the present time, blockchain models are partially permitted or are public like Ethereum which is unregulated and relies on intrinsic standards.
- Prevailing cyber laws in India touch almost all aspects of transactions and activities involving the internet, www and cyber space (IT Act 2000 and amended in 2008, section 463 of IPC, and section 420). But in today's techno-savvy environment the world is becoming more and more digitally sophisticated and so are the crimes. India's cyber laws are lacking in this respect.
- There are sufficient global examples of countries that have taken nuanced and cautious steps in regulating the technology, and are focusing on stopping illegal activity without hurting innovation.

Conclusion

Currently, we are witnessing the next phase in a digital revolution led by technologies like blockchain. Channelizing India's human capital, expertise, and resources supported with the right policies will help India to make the most benefit of it.

Q-3 -Analyse the applications of drones in agriculture and its potential benefits to farmers and agriculture industry as whole?

Approach

In this question candidates need to write about applications of drones in agriculture and its potential benefits to farmer and agriculture industry

Introduction

World Economic Forum (WEF), in its latest report, stated that drones have the potential to be the indicator of technology-led transformation of Indian agriculture.

Body

The agricultural drone market is expected to grow from a \$1.2 billion (USD) industry in 2018 to \$4.8 billion in 2024.

Applications of drones in agriculture -

- Cost of application - As per WEF, drone usage could reduce the cost of application by 20% and mitigate health hazards of manual work.
- Precision agriculture - It is also useful in promoting precision agriculture, thereby optimizing input use.
- Productivity - Precision agriculture know-how and farm advisory services based on data sources can enable 15% increase in productivity.
- Evidence-based planning - Drones enable data collection and resource-efficient nutrient application which facilitates crop production forecast, and evidence-based planning.
- Emerging technologies - Drones can be an effective enabler for mainstreaming emerging technologies such as yield estimation or insurance.
- Aid in government initiatives - With drones, government initiatives like Per Drop More Crop will improve and water use inefficiency in irrigation will decline.
- Drones' data integrated with GIS and Google Earth satellite images will streamline schemes like PMFBY by aiding crop cutting experiments, crop-loss estimation, insurance determination and dispute resolution.
- Agri-research - With drones, agri-research will become highly customized and localized.
- Better pricing - Since drones can capture backward and forward linkages, food processing industries will procure from farmers at better prices.
- World Economic Forum (WEF), in its latest report, stated that drones have the potential to be the indicator of technology-led transformation of Indian agriculture.

What role do drones play in addressing the challenges?

- The term drone, sometimes referred to as unmanned aerial vehicles (UAVs) refers to any aerial vehicle that receives remote commands from a pilot or relies on software for autonomous flight.

- Many drones display features like cameras for collecting visual data and propellers for stabilizing their flight patterns.

What steps were taken by the government to promote the use of drones?

- The agriculture ministry had released standard operating procedures (SOPs) for using drones in pesticide and nutrient application.
- Agriculture Ministry provides grant upto Rs. 10 lakhs to agricultural institutes for purchase of drones.
- Union Finance Minister has announced in the Budget 2022-23 that the Centre will promote 'Kisan Drones' to help farmers assess crops, digitize land records, spray insecticides and nutrients.
- The government has notified the Drone Rules 2021 which is expected to make drone operations simpler for civilian drone operators.
- New Delhi has eased drone policies with mechanisms such as the Production Linked Incentive scheme and import bans paving the way for the domestic manufacturing sector.
- Garuda aerospace has set a goal of developing one lakh drones, which are being used for diverse purposes.
- Under the "SWAMITVA scheme", land records are being documented through drone technology. Also medicines, vaccines are being supplied to various parts of the country and it is also being used for sprinkling pesticides etc on crops.

What is the need of the hour?

- The need is to scale up drone use in the agriculture sector from the present 10,000 aerial vehicles.
- Civil-military engagement should be promoted to realize gains from cross-industry application of drones.
- Consultations may be held with experienced strategic partners like Israel where AI-enabled drones are used for mapping plots, assessing crop damage, and even plucking only ripe apples.

Conclusion-

Promotion of drone in agriculture is a welcome step that can usher in development but it will require collaborative effort of all stake holders (manufacturers, Government agencies and Agriculture institutes) along with awareness and capacity building of farmers to achieve its true potential.