

General Studies – 3; Topic: Science and Technology- developments and their applications and effects in everyday life

Big Data Analytics

1) Introduction

- Big data is a term for data sets that are so large or complex that traditional data processing application software is inadequate to deal with them.
- Almost 90% of the world's data today was generated during the past two years.
- “Big data” refers to the use of predictive analytics, user behavior analytics, or certain other advanced data analytics methods that extract value from data.
- Big data can be understood as the consolidation and centralization of public data inputs from various spheres of activities like commercial, consumer based, census, or even Aadhar controlled personal information.

2) Importance

- **Good Governance**
 - a. Big data with the government is a huge boon for governance.
 - b. Consumer habits can be studied and policies can be framed which would then be in line with the need of the hour.
 - c. Patterns of investment, savings and expenditure can be revisited with changing time and government can instil such changes in its policies
 - d. Security of the state can be further enhanced by access to larger data.
 - e. Transforming government programmes and empowering citizens to improving transparency and enabling the participation of all stakeholders.
 - f. Geo-tagging in MGNREGA can help analyse the effectiveness of the policy geographically and bring in required changes
 - g. The Digital India and Smart Cities initiatives of the government also include efforts to utilise data to design, plan, implement, manage, and govern programmes.
- **Tackling Antibiotic Resistance**
 - a. Tackling the superbug problem requires massive data collection and analysis.
 - b. Big data can provide insightful information about unregulated sale of ABs without prescription
 - c. The data generated can be used for developing statistical models to show the relationship between antibiotic consumption and associated resistance.
- Massive amounts of data generated by cities can be used to improve infrastructure and transport systems as Singapore has done.
- Cellphones data can help direct relief efforts in the aftermath of a natural disaster.
- Power-usage data can be analysed to optimize energy grids and plant power generation
- Discoms in India are already using data from last-mile sensors to implement measures for cutting down aggregated technical and commercial losses.
- The use of information technology, open source data, and proper governance will help in improving human development indices.
- Crop-related ground data helps crop insurance companies for accurate assessment of risk and speedy settlement of claims.

3) Concerns / Challenges

- Challenges include capture, storage, analysis, search, sharing, transfer, updating and information privacy.
- Cyber security: recent ransomware attacks have uncovered the vulnerability of even the developed countries towards hacking.
- Validation and verification is yet another issue. False figures and facts and then formulating the policies would create more problems.
- Ethics of Big Data analytics is an area of major debate. The issues range from Anonymization of data to what data should be collected and what use it should be put to.
- Infrastructure in India for efficient data collection and management is lacking
- Potential drain of economic wealth of a nation. Financial rewards of big data are enjoyed by the MNCs located in USA.
- Big data is like a double edged sword and it will be wise to handle it with utmost care and conscience.

4) Way Forward

- Infrastructure for efficient data collection and management must be strengthened.
- Build R&D activities in Big Data Science technology at our academic and research institutions for better understanding.
- Training for individuals on how to protect their privacy and for organisations and government officials to put in place strict firewalls, data backup and secure erasure procedures.
- Start-ups can develop technology that enables users to control who gets access to the data about their behaviour patterns in the digital world.
- Government can encourage establishment of data centres so that data remain within the country.
- Encouraging formation of native internet giants like how china has done.
- Evolve appropriate policies to counter the side effects of the Digital Plan, and avoid unforeseen eColonisation of India.
- Actively engaging policy makers and researchers with the processed data is crucial to bring in cross-sectoral transformation.