Fourth Industrial Revolution (4IR)

Why in news?

While World Economic Forum (WEF) advocates fourth industrial revolution, others fear corporate takeover.

What is Fourth Industrial Revolution (4IR)?

- **Fourth Industrial Revolution -** It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres.
- It brings together digital technology and the physical world to create a new range of products and services.
- **Fields** - 4IR is a collection of technologies such as cloud computing, big data, augmented reality, system integration, autonomous robots, cybersecurity, simulation, additive manufacturing, and the internet of things (IoT).
- **Recent examples** - A pacemaker with wireless sensors that will dissolve in the human body after completing its job was unveiled by the US researchers.
- The first living robot called xenobots was demonstrated in 2021 by a team of US scientists.

> The term 4IR was coined by **Klaus Schwab in 2016** when he described it as an industrial revolution that “does not change what we are doing, but changes us”.

What are the different stages of Industrial Revolution?

- **First industrial revolution** - Used water and steam power to mechanise production (1800s).
- **Second industrial revolution** - Used electric power to create mass production (early 1900s).
- **Third industrial revolution** - Used electronics and information technology to automate production (late 1900s).
- **Fourth industrial revolution** – It is built on the third revolution with data at its core. (now)

Why is everyone interested in 4IR?

- It was claimed that artificial intelligence and other associated technologies will enhance human beings in the future.
- Some futurists believe that artificial intelligence will surpass human intelligence by

2029.

What about the picture of 4IR in India?

- In 2020, Union Ministry of Heavy Industries launched the Smart Advanced Manufacturing and Rapid Transformation Hub **(SAMARTH) scheme**, which brings together manufacturers, vendors, and customers to make them aware of 4IR technologies.
- In 2022 budget speech, Finance minister Nirmala Sitharaman announced new 4IR-driven projects, including **Drone Shakti**, to encourage start-ups that will facilitate the use of drone services.
- In the field of education, **DESH Stack ecosystem** which will use blockchain technology to make the process of skill acquisition transparent and efficient would be announced.
- India even has a **4IR centre in Mumbai** run by WEF, which is closely working with several state governments.
- The Centre has recently come up with the **Fourth Industrial Revolution for Sustainable Transformation (FIRST) Cancer Care model** in which 4IR technologies would be used to provide better healthcare for cancer patients.
- India is also exploring **digital twin technology** (Creating a complex virtual model that is the exact counterpart of a physical thing) for creating models.
- The pan-India **3D maps programme** was launched for 100 smart cities so that 4IR-based projects, such as driverless cars, will become easier to implement.

S.No	Pros of 4IR	Cons of 4IR
1	Strategic competitive advantage	Negative impact of data sharing in a competitive environment
2	Organizational efficiency & effectiveness	Total implementation of industry 4.0 is necessary for success
3	Organization agility	Handling employees and trade unions apprehensions
4	Manufacturing innovation	Need for highly skilled labour
5	Profitability	Sado-technical implications of industry
6	Improved product safety & quality	Cybersecurity
7	Delightful customer experience	High initial cost
8	Environmental and social benefits	
9	Improved operations	

What are the concerns?

- **Job loss** - The immediate fear is that of job loss as machines and technology will take over many jobs across sectors.
- The employees of the Indian Railways (the largest employer in India) have already started protesting against the introduction of vending machines for ticket dispensation at stations.

- **Safety and ethics** - There are several other critical concerns surrounding safety, ethics and the short- and long-term socio-economic impact.
- For instance, there were massive disruptions in flights in the US in 2022 because of fears of interference between the C band of the 5G wireless technology and the altimeters of aircraft.
- **Inequality** - The adoption of 4IR technologies is also going to be skewed as developing and least developed countries lack the data framework and infrastructure.
- The problems in the real world are creeping into virtual reality.
- **Bias** - Several studies show that facial recognition technologies have a higher chance of misidentifying African and Asian people compared to their Western counterparts.

Reference

1. Down to Earth | Fourth industrial revolution

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