



National Strategy for Additive Manufacturing Policy

For Prelims: 3D Printing and its Usage

For Mains: National Strategy for Additive Manufacturing Policy, 3D Printing, 'Make in India', 'Atmanirbhar Bharat Abhiyan'.

Why in News?

Recently, the **Ministry of Electronics and Information Technology (MeitY)** unveiled the **National Strategy for [Additive Manufacturing Policy](#)**.

What are the Highlights of Policy?

- The policy aims to **increase India's share in global additive manufacturing to 5%** within the next three years and **add USD 1 billion to the gross domestic product**.
- Further, it aims to develop **50 India specific technologies for material, machine and software, 100 new startups for additive manufacturing, 500 new products** and train at least **1 lakh new skilled workers**.
- The Policy postulate the tenets of '[Make in India](#)' and '[Atmanirbhar Bharat Abhiyan](#)' that **advocate self-reliance** through the technological transformation of the production paradigm.

What is 3D Printing?

- **About:** 3D printing is **also known as additive manufacturing** which uses materials such as **plastics and metals** to convert products envisaged on **computer-aided design to real three-dimensional items**.
 - 3D printing is the **opposite of subtractive manufacturing** which is cutting out/hollowing out a piece of metal or plastic with, for instance, a milling machine.
- **Intersection of Technologies:** Additive Manufacturing is the **next generation of digital manufacturing** that allows the **intersection of computing electronics, imaging and the emerging areas of [Artificial Intelligence](#), pattern recognition** and will create intellectual property and export opportunities.
- **Possible Impact:** Additive Manufacturing (AM) has immense potential to **revolutionize India's manufacturing and industrial production** landscape through **digital processes, communication, imaging, architecture and engineering**.
 - The **next wave of startups** will emerge in this area.
- **Usage:** 3D printing traditionally has been used for **prototyping**. 3D printing has a lot of scope in making artificial limbs, stents, dental crowns, parts of automobiles and consumer goods, among others.

What are Opportunities for India?

- **Eliminating Large Capital Investments:** Machines are cheaper, inventories can be small and

space requirements are not large.

- Thus, jump-starting manufacturing does not face the massive hurdle of large capital requirement and the traditional small and medium enterprises can easily be adapted and retooled towards high technology manufacturing.
- **Leveraging India's IT Power:** The Indian software industry is well-established, and plans to increase connectivity are well underway as part of '[Digital India](#)'.
 - This would allow for the creation of additive manufacturing facilities in small towns and foster industrial development outside of major cities.
- **Uniform Quality Standards:** Maintaining uniform product quality is far easier because the entire system is built at the same time and assembly is not required.

What are the Associated Challenges?

- **Lack of Standards:** Since 3D printing is a **very niche and new domain**, there are **no global qualifications and certification norms**.
- **Hesitation in Adoption:** Another challenge is **to convince the industry and ministries to push for its adoption** in their respective sectors as any new technology, which is not understood easily, faces a tough time.
- **Risk of Job Losses:** In the initial meetings on the subject, there was a **lot of resistance on whether this technology would eat into the jobs of highly-skilled workers** in the medical equipment or aerospace technology sectors.
- **High Costing:** Although actual printing is cheap, **parts to build a 3D printer are very expensive** as the **equipment and manufacturing costs are very high**. In addition, there is a **concern about warranty** hence, resource companies are **hesitant to put 3D-printed parts into their machines if they are not covered for damage** in case the parts fail.
- **Sector Specific Challenges:** Globally and even in India, the **largest consumer of 3D printing is the automotive industry** and right now it is going through a lot of changes like the introduction of [BS-VI](#) and [electric vehicles](#). **New vehicle design development has slowed** and so has the demand for 3D printing.

Way Forward

- **Promotion of R&D:** There is a need to **accelerate research at our premier engineering schools** on manufacturing machines and methods and encourage the formation of product design centers so that the products are built to **suit the Indian environment and consumers**.
- **Need for Government Support:** There is a need for government support to provide incentives for distributed manufacturing in smaller towns, and for the IT industry to work on creating platforms and marketplaces that connect consumer demands, product designers and manufacturers in a seamless way.

[Source: IE](#)

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