

GOVERNMENT OF INDIA
MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY
RAJYA SABHA
UNSTARRED QUESTION NO. 3258
TO BE ANSWERED ON: 20.03.2026

TECHNOLOGICAL SOVEREIGNTY IN CRITICAL SECTORS

3258. SHRI S.R. SIVALINGAM:

Will the Minister of ELECTRONICS AND INFORMATION TECHNOLOGY be pleased to state:

- (a) whether Government recognizes the imperative need for building robust technology sovereignty instead of adopting business models copied directly from global regions;
- (b) if so, the details of steps Government is implementing for fostering truly Indian technology development and innovation across various critical sectors; and
- (c) the action taken by Government to support domestic technology companies achieving global leadership without relying exclusively on foreign investment frameworks?

ANSWER

MINISTER OF STATE FOR ELECTRONICS AND INFORMATION TECHNOLOGY
(SHRI JITIN PRASADA)

(a) to (c): The Government recognizes the strategic importance of building technological sovereignty in critical sectors. It has taken several initiatives to promote indigenous design, development and manufacturing of key technologies.

Our approach is based on strengthening domestic innovation capabilities and ultimately creating resilient technology ecosystems rather than relying solely on models adopted from other global regions.

The Government of India has undertaken several initiatives in this regard. The key initiatives undertaken by MeitY, its R&D organisations, and other departments are given below, with details provided in **Annexure**:

1. R&D initiatives to address strategic and societal requirements

MeitY supports research projects under the R&D in IT, Electronics, Communications and Broadband Technologies (CC&BT) Scheme at academic institutions, research organisations and start-ups. This enables innovation and development of indigenous technologies for strategic and commercial applications.

2. IndiaAI Mission

The Union Cabinet has approved the **IndiaAI Mission** with an outlay of ₹10,372 crore to establish a comprehensive ecosystem for catalysing AI innovation in the country. This is ensured by democratizing the access to computing infrastructure, high-quality datasets, indigenous AI models, startup support and industry partnerships.

3. Semiconductor Ecosystem Development

Recognising the importance of semiconductors for technological sovereignty, the Government launched the **Semicon India Programme** in 2022 with an outlay of ₹76,000 crore to develop semiconductor design and manufacturing capabilities in the country.

4. Design Linked Incentive (DLI) Scheme for startups in semiconductor design

DLI Scheme promotes design, development, and deployment of semiconductor products such as Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores.

It also provides infrastructure support for chip design to eligible applicants, including access to EDA tools, IP cores, and fabrication facilities.

5. Chips to Startup (C2S) for workforce development in chip design area

The C2S programme, launched in 2022, aims to develop semiconductor design capabilities in academic institutions and train 85,000 industry-ready engineers in chip design area. Advanced EDA tools and IPs are provided to students for designing the chips.

6. Electronics Component Manufacturing Scheme (ECMS)

To deepen and broaden the electronics manufacturing ecosystem, the Government launched the Electronics Components Manufacturing Scheme (ECMS) in April 2025.

The scheme provides financial incentives on domestic manufacturing sub-assemblies such as camera module, display module optical transceivers, key components such as Printed Circuit Boards (PCBs), passive components, electro-mechanical components and capital equipment for electronics manufacturing and its supply chain.

7. National Supercomputing Mission (NSM)

A complete ecosystem has been established with the focused goal of achieving self-reliance in supercomputing. It includes, inter alia, the design, development and manufacturing of critical supercomputing sub-components, such as, Rudra servers, Trinetra interconnect, liquid cooling systems and indigenous software stacks.

8. Research and standardisation in 4G, 5G and future mobile network technologies is supported through participation in global bodies such as 3GPP, ITU and IEEE, leading to the development of advanced simulation tools, technology prototypes, Standard Essential Patents (SEPs) and proprietary intellectual property.

9. Department of Science and Technology (DST) supports indigenous R&D and innovation through multiple initiatives:

- (a) Anusandhan National Research Foundation (ANRF):** Supports academic research, industry collaboration and translational research across priority areas such as AI, EVs, deep tech, climate, health, semiconductors and advanced materials, with an outlay of ₹50,000 crore over five years
- (b) Research, Development and Innovation (RDI) Fund:** With an allocation of ₹1 lakh crore, the scheme supports late-stage 79 technology development and commercialisation focusing on critical technologies such as AI, quantum computing, robotics and biotechnology. Together, ANRF and RDI address the full innovation pipeline, from knowledge creation in academia to industrial deployment and commercialization
- (c) Advanced Manufacturing Technologies (AMT) Programme of DST:** enables development of novel manufacturing technologies and indigenous machinery. Several other Ministries and Departments have also supported indigenous technology development across critical sectors through initiatives

Some of these are Telecom Technology Development Fund (TTDF) of the Department of Telecommunications (DoT), Technology Development Fund (TDF) of the Ministry of Defence (MoD), the Technology Adoption Fund (TAF) of the Department of Space (DoS), and Biotechnology Industry Research Assistance Council (BIRAC) of the Department of Biotechnology (DBT)

These initiatives have contributed to the development of indigenous technologies and innovation across various critical sectors in the country.

Annexure

Details of key initiatives of MeitY, its R&D organisations, and other departments

1. MeitY R&D initiatives to address strategic and societal requirements: Some of the key initiatives supported under MeitY supported **R&D in IT/Electronics/Communications and Broadband Technologies (CC&BT) Scheme** - design and fabrication of 32-bit and 64-bit multi-core microprocessors, NavIC receiver chipsets, and Digital Programmable Hearing Aids using indigenous processors, along with research in photonics and quantum technologies including Quantum Random Number Generators (QRNG).

Technologies for early detection of breast cancer and recovery of precious metals and critical minerals from e-waste such as PCBs, Li-ion batteries and solar cells have also been supported.

2. IndiaAI Mission: aims to establish a robust and inclusive AI ecosystem aligned with India's development goals through the seven pillars. These include IndiaAI Compute, AIKosh, IndiaAI Foundation Models, IndiaAI FutureSkills, Startup Financing, Application Development and Safe & Trusted AI.

3. Semiconductor Ecosystem Development: Under the Semicon India Programme:

- (a) 10 semiconductor units (2 fabrication and 8 ATMP/OSAT facilities) approved. These facilities are expected to produce over 24 billion chips per year and 55,000 wafer starts per month from fabrication facilities.
- (b) Under the **Design Linked Incentive (DLI) Scheme**, 24 chip design projects have been approved for domestic companies, startups and MSMEs across sectors such as

surveillance, drones, satellite communication, energy metering and IoT. 105 fabless companies have been supported with advanced design tools. Seven chips have already been fabricated out of 16 designs taped-out across multiple foundries, including advanced nodes such as 12 nm.

4. Chips to Startup (C2S) Programme for chip design workforce: Under C2S programme, advanced chip design tools have been enabled for 315 institutions, with approximately 200 lakh hours of tool usage. Additionally, 146 chip designs have been taped-out by 49 institutions, with 94 student-designed chips successfully fabricated and packaged by the Semiconductor Laboratory (SCL), Mohali. This resulted into 68,000 specialized manpower in chip design area.

5. Electronics Component Manufacturing Scheme (ECMS): The scheme has received overwhelming response from industry so far. Till date, 46 applications have been approved across 11 states under the ECMS scheme, which are expected to attract an investment of Rs 54,567 crores, projected production of Rs 3.67 lakh crore and expected employment generation of 50,794 direct jobs.

6. National Supercomputing Mission (NSM): Under the NSM, 38 systems delivering 48 petaflops across the country, supporting more than 10,000 researchers, enabling 1.5 crore compute jobs.

HPC applications of National Importance developed and deployed in various domains i.e. NSM Platform for Genomics and Drug Discovery, Flood Forecasting and Disaster Management, Urban Environment and Weather Modelling, Seismic Data Processing System, along with the end users.

7. Other Indigenous Technology Development by MeitY R&D Organisations:

(a) Centre For Materials for Electronics Technology (C-MET): Developed indigenous critical material technologies including Hafnium metal sponge for strategic applications such as satellite thrusters and semiconductor devices. Ultra-high purity materials including Cadmium, Tellurium and 7N Germanium are also produced for defence sensors, radars and radiation detection systems.

(b) Society for Applied Microwave Electronics Engineering & Research (SAMEER): Developed advanced atmospheric instruments including radiometers, MST/ST radars, sodars and ionosondes for weather monitoring under the Mission Mausam programme. SAMEER has also developed indigenous medical linear accelerators (LINAC) and high-power RF components for strategic and medical applications.

(c) Centre for Development of Advanced Computing (C-DAC): Developed indigenous technologies for strategic programmes of ISRO and defence agencies, including Ultrasonic Solid-propellant Burn Rate Measurement Systems (USBRMS), instrumentation amplifiers, non-destructive testing systems and autonomous bathymetric survey vessels. C-DAC has also implemented the Emergency Response Support System (ERSS-112) and developed digital public infrastructure solutions such as e-Hastakshar eSign, which has facilitated over 37 crore digital signatures.

8. Open Digital Platforms and skilling initiatives in critical sectors: Indigenous digital platforms such as **BOSS (Bharat Operating System Solutions)** and **Meghdoot cloud platform** provide secure open-source computing and private cloud infrastructure for

government and strategic users. Capacity building initiatives including **FutureSkills PRIME, ISEA, Work-Based Learning and SwaYaan for drone technologies** support development of skilled manpower in emerging technologies.

9. The **Department of Science and Technology (DST)** has undertaken several initiatives to strengthen indigenous R&D capabilities and promote innovation in critical sectors. Key initiatives include the following:

- (a) Under the **Advanced Manufacturing Technologies (AMT)** Programme, R&D support is provided for novel manufacturing technologies focusing on design and process innovations, indigenous development of machines, instruments and devices, and improved materials processing for enhanced performance and scalable production.
- (b) The **Anusandhan National Research Foundation (ANRF)** promotes research and innovation across universities, colleges and R&D institutions. Its Mission in High Impact Areas (MAHA) supports priority-driven, mission-mode research through multi-institutional collaboration. Priority areas include Electric Vehicles, 2D Materials, MedTech, AI for Science and Engineering, and CRM research. ANRF also supports researchers through programmes such as Advanced Research Grant (ARG), Prime Minister Early Career Research Grant (PMECRG), and Inclusivity Research Grant (IRG).
- (c) The **Research, Development and Innovation Fund (RDIF)** supports high-TRL transformative projects, acquisition of critical technologies, and creation of Deep-Tech Funds in priority areas such as energy transition, climate action, quantum technologies, robotics, AI, biotechnology, health, space and the digital economy.
