GOVERNMENT OF INDIA

MINISTRY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF SCIENCE AND TECHNOLOGY

RAJYA SABHA

UNSTARRED QUESTION NO. 770

ANSWERED ON 05/02/2026

PROGRESS UNDER NM-ICPS

770 DR. PARMAR JASHVANTSINH SALAMSINH:
SHRI BABUBHAI JESANGBHAI DESAI:
SMT. MAYA NAROLIYA:
SHRI AMAR PEL MAURYA:

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) the progress made under the National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS) during 2025;

(b) the status and scope of BharatGen, the generative AI model in Indian languages and its intended applications; and

(c) the future roadmap for strengthening industry linkages, scaling successful technologies and enhancing societal impact under NM-ICPS?

ANSWER

MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE
MINISTRY OF SCIENCE AND TECHNOLOGY & EARTH SCIENCES
(DR. JITENDRA SINGH)

(a) The Department of Science and Technology (DST) is implementing the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) with a total outlay of ₹3,660 crore for the period 2018–2027, aimed at strengthening India's capabilities in cutting-edge cyber-physical technologies such as Artificial Intelligence (AI), Machine Learning (ML), Internet of Things (IoT)&Internet of Everything(IoE), Data analytics, Robotics and Autonomous Systems, Cybersecurity, Quantum Technologies, etc.

The Mission is being implemented with all the TIHs undertaking activities under the following four (04) categories:

- Technology Development
- Human Resource Development (HRD) and Skill Development

- Innovation, Entrepreneurship, and Startups
- International Collaborations

Key progress and outcomes achieved under NM-ICPS during 2025 include:

I. Institutional Ecosystem Creation:

A total of 25 Technology Innovation Hubs (TIHs) have been established in premier academic institutions across the country. Further, four (04) TIHs at IIT Kanpur, IISc Bangalore, ISM Dhanbad; and IIT Indore have been upgraded to Technology Translation Research Parks (TTRPs), with focus area of Cybersecurity, Robotics & AI Systems, Mining Technologies from Exploration to Beneficiation and Digital Healthcare, respectively.

II. Significant achievements have been made under NM-ICPS, with a large number of technologies/ technology products developed in the various domains of cyber-physical systems. The details of outcomes and achievements of the Mission during 2025 are as follows:

S.No.	Mission Activity	Outcome	Total Number
1.	Technology Development	Technologies/Technology products (TRL >7)	297
		Technologies commercialised	112
2.	Human Resource Development	Fellowships granted	2371
		Training Programs conducted	441
		Participants in Training Programs	37035
3.	Entrepreneurship Development	Start-ups supported	407
4.	International Collaborations	Collaborations with Foreign Institutions	41

Few of the technologies developed under NM-ICPS during 2025 are as follows:

- 5G-Advanced ORAN Massive MIMO Radio Unit (32TR RU) developed by TIH at IIIT Bengaluru: The technology facilitates high-speed and reliable connectivity at a cost viable for unconnected and far-flung areas.
- Smart Mining and Edge-AI Monitoring Solutions developed by TIH at IIT (ISM) Dhanbad: The technology enables reliable long-range drone connectivity (up to 50 km), allowing safe and efficient monitoring of remote mining areas and improving overall mine safety and operations.
- AI-Enabled Smart Monitoring and Advisory Solutions developed by TIH at IIT Bombay: The technology includes AI and IoT-based systems for agricultural monitoring, decision support, and productivity enhancement.

(b) The scope of BharatGen is to develop a range of sovereign foundational AI models tailored towards Indian languages, culture and contexts. BharatGen models will support scheduled 22 Indian languages. It spans multiple modalities, including text (via Large Language Models), speech (Text-to-Speech and Automatic Speech Recognition), and vision-language systems.

The status of BharatGen with respect to the development and release of models and applications for Indian languages is as follows:

i. Text models: Param is a 7 billion parameter, multilingual large language model designed to understand and generate text across English, Hindi, and 14 additional Indian languages.

ii. Speech models:

- Automatic Speech Recognition model for Hindi language: A 30 million parameter model designed to convert Hindi speech to text.
- Text to Speech models: Currently supporting Hindi, Malayalam, Telugu, Kannada, Punjabi, Bengali, Gujarati, Marathi & Tamil.

iii. Vision Models: Patram, India's first Vision-Language Model for Documents, is a 7 billion parameter model, designed to seamlessly integrate visual perception with linguistic understanding, currently supporting the English language.

BharatGen has released domain specific fine-tuned models for Ayurveda (Ayur Param), Indian agriculture (Agri Param), Indian legal domain (Legal Param) and Indian finance domain (Finance Param). In addition, all BharatGen models (text, speech and vision) are useful for applications across healthcare, agriculture, education, governance and other domains.

(c) The NM-ICPS envisages a roadmap focused on strengthening industry and government partnerships, scaling validated technologies based on cyber-physical systems (CPS), and enhancing sustained societal impact. The four (04) TTRPs established under NM-ICPS have a mandate to significantly scale translational research, commercialization and industry engagement for enhancing societal impact in sectors like healthcare, transport, smart manufacturing, energy, environmental, agriculture and security. In addition, enhanced funding support has been provided to three (03) TIHs at IIT Madras, IIT Hyderabad, and IIT Bombay for supporting translational research. With the TTRPs and the TIHs developing technologies across various CPS domains and supporting entrepreneurship development & skill development, the mission emphasizes on transitioning successful pilot deployments into scalable societal solutions.

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