

# Technology Advisory Group (TAG) of Empowered Technology Group (ETG) meets to discuss Strategic Roadmap for Robotics in India

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The Technology Advisory Group (TAG) constituted by the Empowered Technology Group (ETG) convened its third meeting on 3 February 2026 under the chairmanship of Prof. Ajay Kumar Sood, Principal Scientific Adviser (PSA) to the Government of India, to discuss the ecosystem, successes, challenges and strategic roadmap for Robotics in India.



The meeting brought together TAG members, ETG members, senior government officials, leading academicians, and companies and startups in robotics, to discuss the current state and map the domestic robotics ecosystem.



Dr. Preeti Banzal, Adviser/Scientist 'G' at the Office of PSA, in her welcome remarks, referred to the 2<sup>nd</sup> TAG meeting held in February 2025 on Advanced Manufacturing. She emphasised the importance of focusing on advanced robotic technologies, a key agenda of the 3<sup>rd</sup> TAG meeting.

In his keynote address, Prof. Sood highlighted the vision for a self-reliant India in Robotics through indigenisation. He spoke about the paradigm shift in robotics, and strategic focus on augmentation rather than replacing human labour. Need for sector-specific priorities such as collaborative robots and physical AI for healthcare, unmanned and dual-use platforms for defence and internal security were highlighted.

Shri S. Krishnan, Secretary, MeitY, highlighted the draft National Strategy on Robotics, which has been formulated through comprehensive inter-ministerial and stakeholder consultations. He emphasized that existing MeitY frameworks including the IndiaAI Mission, the India Semiconductor Mission, and the ecosystem for Electronic Components serve as foundational pillars that can be effectively leveraged to support a future dedicated Robotics Mission. Dr. Sameer Kamat, Chairman, DRDO, underscored the strategic imperative of achieving software sovereignty, specifically urging the indigenization of critical design and simulation tools. Complementing this, Dr. Renu Swarup, Former Secretary, DBT, advocated for a demand-driven approach, asserting that a rigorous needs prioritization exercise must precede product development to ensure alignment with high-impact sectoral requirements. Lt Gen N.S. Raja Subramani (Retd), Military Advisor, NSCS, emphasized that the integration of robotics into the national defence architecture is no longer an option but a strategic imperative for modern warfare.

Mr. Rohit Gupta, CTO at the Office of PSA, provided a brief overview of the national and global robotics landscape, effectively setting the tone for the subsequent discussions.

The meeting featured in-depth presentations from leading experts covering critical dimensions of Robotics:

- Mr. Raghu Dharamaraju, CEO, ARTPARK (IISc Bangalore), highlighted ARTPARK's initiatives to translate AI and robotics technologies from laboratory research to market-ready solutions.
- Prof. Subir Kumar Saha & Mr. Ashutosh Dutt Sharma, (IIT Delhi), outlined I-Hub Foundation for Cobotics' (IHFC) National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS)-supported mission to bridge academic research and industrial cobotics via R&D, entrepreneurship, and skilling.
- Prof. M Manivannan, IIT Madras, emphasised tactile perception and haptics as a foundational layer of Embodied AI, showcasing indigenous R&D and the need for a national Tactile Intelligence initiative.
- Mr. Farid Ahsan, Co-founder, General Autonomy, discussed embodied AI-driven automation using indigenous humanoid and quadruped robots, stressing the need for national enablers such as Product Linked Incentive (PLI) support, data platforms, and deployment-focused grand challenges.
- Mr. Akash Gupta, CEO, GreyOrange, presented the large-scale deployment of Physical AI in warehouse and retail automation. He highlighted indigenisation of key components, talent development, importance of domestic standards, DPI for embodied AI, & Government to Government (G2G) certifications.

Further, the deliberations and stakeholder interventions underscored the following key takeaways:

- The need for a coherent policy and incentive framework to strengthen domestic manufacturing, reduce import dependence, and promote calibrated public procurement that balances quality, cost, and technological capability.
- Recognition that there exist significant gaps in hardware and component ecosystems, including actuators, sensors, transducers, chipsets, precision gears, and design and simulation tools leading to strategic vulnerabilities.
- The importance of strengthening testing, certification, and standardisation frameworks, and adopting a phased approach to indigenisation of critical components.
- There was consensus on the need to develop shared national data and a federated infrastructure to support robotics use cases, enable high-quality, task-specific data access, and address supply-chain challenges, including the indigenisation of software tools and design platforms across defence, healthcare, and agricultural sectors. This infrastructure would be critical to democratise innovation, accelerate deployment, and support talent development.
- Prioritisation of haptics, need-based end-user targeting, and inclusion of stakeholders in the development pipeline, along with user-defined KPIs to guide a concerted approach for product development and deployment.
- Promotion of grand challenges, such as IDEX model, and utilisation of schemes like RDI to create dedicated funding funnels for robotics, alongside mechanisms for government procurement in strategic sectors.
- The need for intensified, mission-oriented R&D across mechanics, materials science, haptics, communication, industrial engineering, and instrumentation, supported by a Product Development and Partnership (PDP) model to overcome fragmentation across academia, industry, and government, alongside MSME clustering, and development infrastructure, and structured field and clinical validation to translate research into deployable systems.
- Requirement of a unified regulatory framework, to address prevalent domestic safety risk and a non-tariff barrier for exports. The recommendations also included setting up accredited testing labs to ensure Indian robots meet global quality norms (ISO/CE), thereby facilitating their export to US.





Dr. (Mrs.) Parvinder Maini, Scientific Secretary at the Office of the PSA, summarised the key outcomes by highlighting the transformative shift in robotics from legacy automation toward embodied intelligence, bio-inspired systems, and adaptive machines capable of operating in unstructured real-world environments. Dr. Maini further underlined the importance of implementing mission-linked grants for startups and MSMEs, strengthening regulations and developing unified standards and certification frameworks. Finally, she highlighted the need for a national robotics roadmap centred on indigenising the core technology stack. She noted that although there is broad agreement on a mission-mode or consortium-based approach, further deliberation is needed on its integration with existing government programmes.

In his closing remarks, Prof. Sood reiterated that a structured and strategic approach to robotics would be a critical enabler of India's long-term industrial growth and its ambition to evolve into a robust product nation. He further emphasised that robotics should be viewed as a force multiplier for national missions, a key demand driver for India's industrial and defence growth, and a cornerstone of high-value manufacturing. Towards the end, he requested all the participants to voice in their specific recommendations that will facilitate in working towards a strategic roadmap for physical AI/robotics.

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