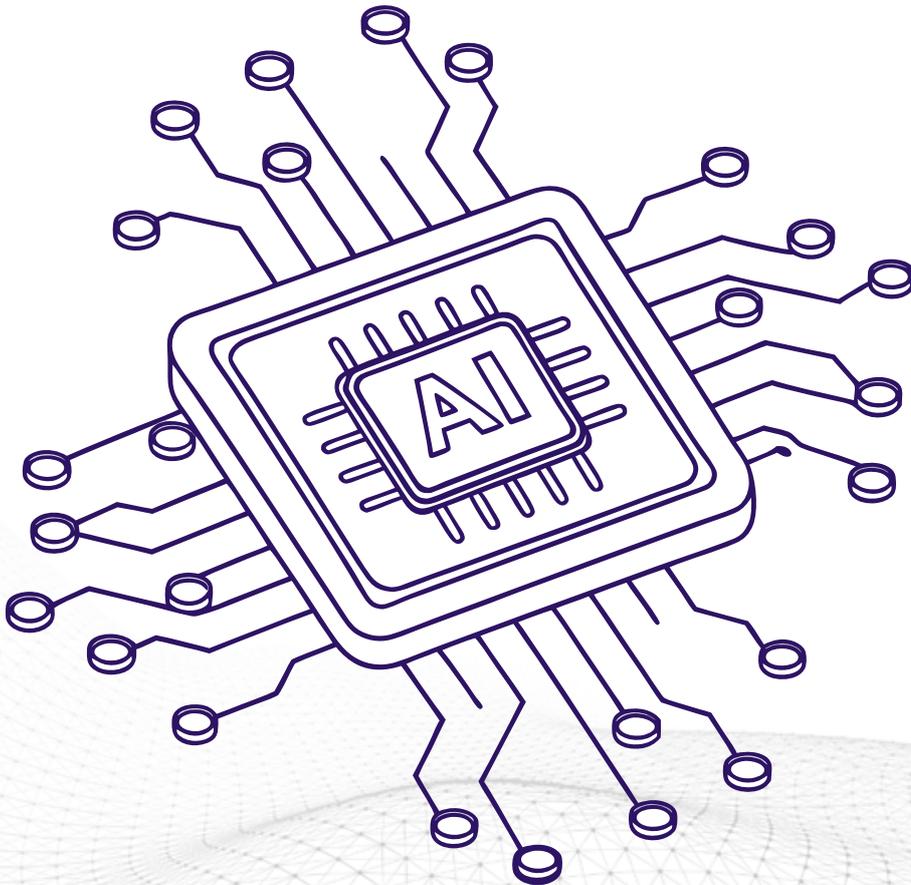# NAM:TECH
Institute of Manufacturing Innovation

AI for Manufacturing Engineering Technology

(AI-MET)

White Paper

Background

Manufacturing Engineering Technology (MET) forms the structural core of modern economies. It is where innovation is translated into scale through significant gains in productivity and national competitiveness. As artificial intelligence rapidly reshapes global production systems and associated value chains, the convergence of AI and MET is emerging as one of the most decisive forces defining the future of industry.

In India manufacturing is growing fast, but AI adoption is very slow. This is indicated by the fact that India's manufacturing gross value added (GVA) grew about 11.9% in 2023-24, one of the strongest upticks in recent years, yet the relatively low share of AI in manufacturing market indicates that most plants still operate on pre-AI production models.

MSMEs anchor India's industrial base contributing roughly 30% of GDP, 50% of manufacturing output, and 45% of exports while employing over 110 million people. Yet only less than 15% of Indian MSMEs have adopted AI or machine learning applications and surveys indicate that upto 70% of MSMEs lack awareness of advanced digital tools.

It is for these reasons that NAMTECH is convening and catalysing an AI for Manfacturing Engineering Technology (AI-MET) platform, anchored in the vision of Viksit Bharat. AI-MET aims to advance & transform the manufacturing ecosystem through unified standards, shared data architectures, common digital platforms, and end-to-end lifecycle support, with MSMEs at the core.

Key stakeholders of the AI-MET platform include government institutions for shaping policy direction, standards and incentives; academia for anchoring and nurturing research, innovation, validation and talent development; and industry comprising of manufacturers, technology providers and system integrators. The deep-tech companies serve as the critical enablers, providing cutting-edge AI, sensing, automation, and cybersecurity capabilities to enable scalable adoption.
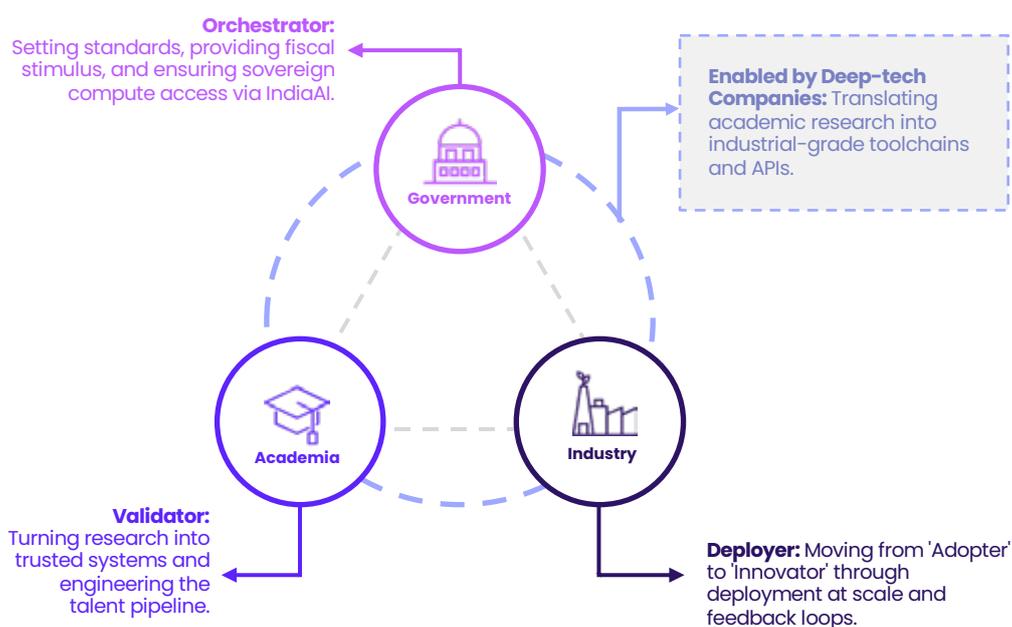

Orchestrator: Setting standards, providing fiscal stimulus, and ensuring sovereign compute access via IndiaAI.

Enabled by Deep-tech Companies: Translating academic research into industrial-grade toolchains and APIs.

Government

Academia

Industry

Validator: Turning research into trusted systems and engineering the talent pipeline.

Deployer: Moving from 'Adopter' to 'Innovator' through deployment at scale and feedback loops.

Figure 1: Conceptual Framework of AI-MET

AI for MET Expert Council

As the founding member of the MET platform, NAMTECH will convene the Council and will bring together leaders from government, industry, and academia

NAMTECH, in its role as a convenor and catalyst for the MET platform, has also initiated the setting up of MET Foundation Centre. To take forward AI for MET an Expert Council is envisioned as the apex advisory and action-oriented body with members from industry, government and academia. The Council will anchor three strategic pillars: Talent and Workforce Development, Applied AI and Industrial Innovation, and Scalable & Inclusive AI Adoption.

Talent and Workforce Development

Building AI-enabled capabilities across engineers, technicians, faculty, and students

Applied AI and industrial innovation

Accelerating real-world AI deployment to drive productivity, quality, and competitiveness across the ecosystem

Scalable and Inclusive AI adoption

Enabling standardized frameworks, shared infrastructure, & capacity-building to drive AI adoption across MSMEs & priority industrial clusters

AI for MET White Paper

NAMTECH has also begun the preparation of a white paper "AI for Manufacturing Engineering Technology (AI-MET)" to bring together perspectives from leaders across industry, academia, and policy. The paper will be enriched by inputs from leading policy makers, academicians and industry leaders. It is intended to serve as a starting point for dialogue with domain experts and relevant stakeholders for collectively shaping a shared direction for the AI for MET ecosystem.

The paper proposes to highlight the need for AI-enabled MET as a strategic national imperative. Extending the intention from diagnosis to action, it will endeavour to outline selected action-oriented priorities for academia, industry, and government. The ensuing recommendations would focus on capability building, technology access, and systemic alignment to enable the responsible and inclusive integration of AI into MET. The present draft concept is an initial proposition, open to discussion and refinement through continued consultation and collaboration.

The initiative reflects a shared recognition that the transformation of MET will require coordinated action across three interlinked constituencies: those shaping future-ready talent, those deploying AI technologies at scale within enterprises and value chains, and those enabling this transition through an enabling industrial and policy environment.

Indicative Priorities for AI-MET Execution

India stands at a decisive moment in its industrial transformation. While AI capabilities are expanding rapidly, their translation into measurable manufacturing outcomes remains uneven. We propose to institutionalize AI-MET for structured, scalable execution through immediate action on the indicated four key areas.

Institutionalize AI-MET Under MeitY / IndiaAI	Operationalize Shared Manufacturing-Intelligence Testbeds	Launch Cluster-Based Workforce Transition Program	Implement Validation & Lifecycle Governance Frameworks
• Anchor AI-MET within the ₹10,000 crore IndiaAI Mission to ensure durable national ownership • Provide structured access to national compute and curated datasets for manufacturing use cases • Align standards, incentives, and cluster rollout under a single accountable framework	• Establish shared testbeds within priority industrial clusters • Validate high-impact use cases capable of delivering 25–40% reduction in unplanned downtime • Enable standardized deployment models to support MSME replication	• Train 50,000 mid-career engineers and supervisors within 24–36 months • Convert plant-level AI insights into measurable operational improvements • Close the adoption gap where MSME AI penetration remains below 15%	• Recognize manufacturing intelligence as engineered systems subject to reliability oversight • Institutionalize monitoring, drift detection, and retraining protocols • Strengthen industrial trust amid rising AI system failures globally

Suggested Way Forward – Institutionalizing AI-MET

The way forward is to institutionalize AI-MET as a national capability through structured, time-bound execution. This would encompass positioning AI-MET as a priority national manufacturing initiative, with formal ownership & stewardship from MeitY and IndiaAI, as well as ensuring structured participation from manufacturing enterprises, MSMEs, deep technology companies and industry bodies, and leading academic institutions

Step 01

• Position AI-MET within the IndiaAI framework as a priority national manufacturing initiative

• Secure cross-sector endorsement from government, industry, and academia

Step 02

• Activate pillar-level leadership within the Council architecture

• Launch focused working groups for governance, deployment, workforce, and validation

• Prioritize high-impact clusters for early implementation

Step 03

• Bring industry bodies and MSME clusters into structured participation

• Align academic institutions to validation and workforce delivery

• Enable deep tech firms and system integrators to deploy at scale

Step 04

• Establish annual AI-MET convergence platform

• Monitor progress against defined outcome metrics

• Integrate field learnings into evolving standards and frameworks

As artificial intelligence reshapes how manufacturing systems are designed, operated, and scaled, MET must adopt AI to evolve rapidly and collaboratively. Fragmented or incremental approaches are unlikely to keep pace with the speed and scale of change required. The transformation would need to go beyond technology adoption to encompass talent, institutions, policy frameworks, and collaboration models.