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Skill Power

SKILLING INDIA

एक कदम आत्मनिर्भरता की ओर



Shakti ki *Saptdhara:* Seven Streams Powering India's Journey to 2047

Decoding PM Modi's Independence Day blueprint – how seven strategic streams converge to make Bharat a developed nation by its 100th year.

Skill India
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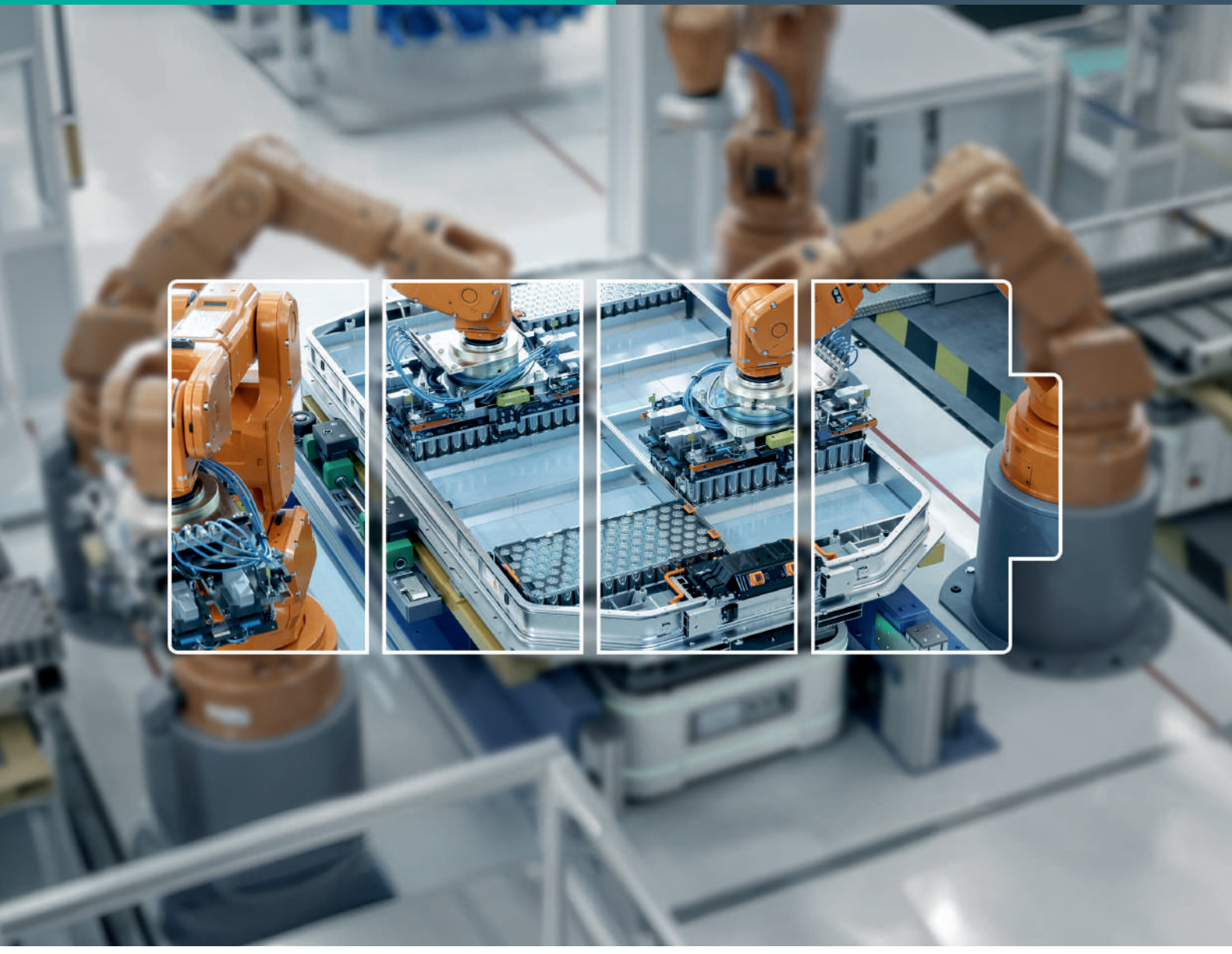
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Dear Readers,

This September issue of SKILL POWER — a magazine covering skilling, technology, economy and policy — is built on one idea: Convergence. Five forces that seem different are actually building one skilled India.

Saptadhara – Skilling the Soul. Gujarat's Saptadhara initiative reminds us that skill is not only technical. It provides a cultural platform to students of higher education, where they feel the bliss of creativity, through seven parallel streams for integral education like arts and crafts, social service, yoga and so on. In this issue we show how these bands build communication, creativity and civic sense — the power skills behind every hard skill.

Semicon – Skilling for Chips. India's chip mission has crossed its first milestone. India has already achieved its earlier target of developing 85,000 semiconductor engineers in four years, against the 10 years originally envisaged. Under Semicon 2.0, skill development is a major component with another one lakh engineers to be added, as the world faces a one-million talent shortage by 2032. We decode what fab-ready curricula must look like.

Digital Data Protection & Privacy – The New Literacy. The Government notified the Digital Personal Data Protection Rules, 2025 on 14 November 2025, operationalising the DPDP Act, 2023. Every startup, MSME, hospital and college is now a Data Fiduciary. This creates an urgent need for 2 lakh+ DPOs, auditors and privacy engineers. Data protection is no longer a legal chapter; it is a job role.

WorldSkills 2028 – The Road to Aichi. Japan to Host 49th WorldSkills Competition in 2028 at Aichi Sky Expo from November 15–20, 2028, with the theme Linking Skills for a Sustainable Future. With Shanghai 2026 next, we have a clear two-year window to move India from participation to podium. This issue maps that roadmap.

MSME – The Real Multiplier. If Semicon is high-end skill, MSME is high-volume skill. India's MSMEs employ 11 crore+ people. Their adoption of micro-credentials and apprenticeships will decide whether our demographic dividend becomes an economic dividend.

Culture, Chips, Code, Competition and Clusters — this is India's skill pentagon.

Read on.

Nagendra Goel
Editor
Skill Power

CONTENTS

SEPTEMBER 2026

06

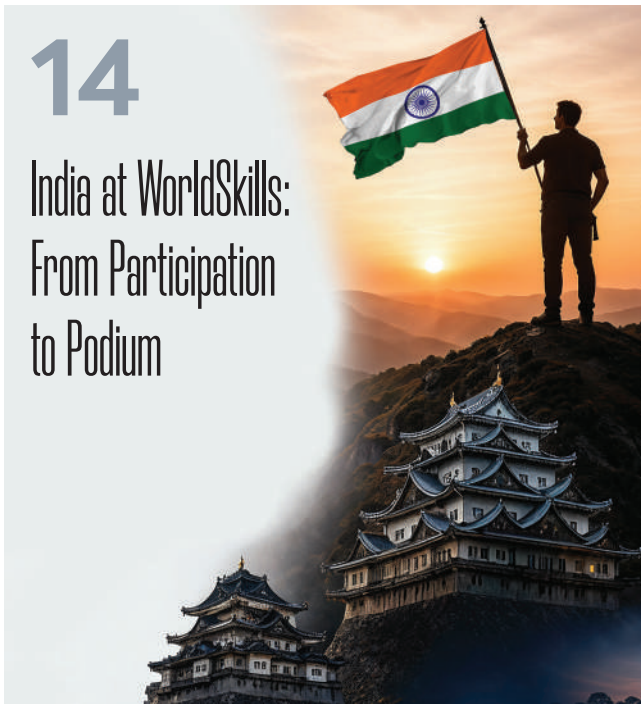


India's Data Protection Revolution

10 Beyond the Prompt



14 India at WorldSkills: From Participation to Podium



18 PM Modi's Saptdhara: Seven Streams Powering Viksit Bharat @2047



24



28 Semiconductors: India's Next Strategic Opportunity

32 क्या अब पेट्रोल में 20% से ज्यादा मिलाया जाएगा एथेनॉल?



34 Moving Forward

36 Event

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India's Data Protection Revolution

The Next Big Opportunity for Skills and Jobs

From Compliance to Capability- Building a Privacy-Ready Workforce for Digital India



India is living through one of the most significant digital transformations in the world

Every day, millions of people make digital payments, open bank accounts, shop online, consult doctors, book travel, study through digital platforms and interact with government and private services. Behind almost every such activity lies something extremely valuable: personal data.

Names, mobile numbers, addresses, financial records, health information, identity documents, employment details and digital behaviour have become an integral part of the modern economy.

The challenge before India is therefore not simply how to generate and use more data. It is how to build a digital economy that uses data responsibly while protecting the privacy of individuals.

The Digital Personal Data Protection Act, 2023 and the Digital Personal Data Protection Rules, 2025 have brought data protection into the centre of India's digital governance framework. This creates a major challenge for organisations—but also a major opportunity for skills, reskilling and employment.

It Is Not Only a Legal or IT Department's Job

When people hear the words data protection, they often think of lawyers, cybersecurity specialists or IT professionals. They are certainly important. But data protection is also about the ordinary employee.

Consider a normal working day: a bank employee collects customer information; a hospital receptionist handles patient records; an insurance executive processes policy details; an HR executive manages employee records; a salesperson maintains customer contact information; a teacher accesses student information; a professional stores confidential client documents; and a field employee uses a mobile phone for official work.

In each case, someone is handling information that belongs to another person. Therefore, data protection cannot succeed merely through policies, legal documents or technology. People make data protection work.

A policy cannot physically stop someone from forwarding a customer list. A compliance manual cannot prevent an employee from leaving a laptop unattended. Technology cannot always compensate for careless behaviour.

This is why India needs to consider data protection as an important workplace skill.

Five Simple Rules for Every Workplace

1. Take Data Only If You Need It — Collect only information necessary for the intended purpose



2. Tell People Why You Need Their Data — Clear communication builds understanding and trust.



3. Take Data Only If You Need It — Collect only information necessary for the intended purpose



4. Keep Data Reasonably Safe — Lock devices, avoid casual sharing and use authorised systems.



5. Delete Data When It Is No Longer Needed — Do not keep personal information merely because storage is available.



From Awareness to Professional Expertise

The data protection ecosystem will require different levels of skills. Not every person needs to become a Data Protection Officer. However, many employees will need some level of awareness or specialised capability.

A three-level skill framework may therefore be considered.

LEVEL 1

Basic Data Responsibility

This level is intended for the large workforce that handles or accesses personal data. Employees should understand what is personal data, why privacy is important, why only necessary data should be collected, how data should be handled safely, when information should be shared and what should be done if a data-related incident occurs.

This could become a foundational workplace skill across industries.

LEVEL 2

Data Protection Operations

This level would apply to personnel who regularly process personal data. Potential occupations include customer service personnel, operations teams, HR executives, sales personnel, healthcare administrators, claims teams, compliance executives, data management staff and IT support teams.

They may require deeper skills relating to data handling procedures, access management, data sharing, retention and deletion, incident identification, incident escalation and sector-specific practices.

LEVEL 3

Data Protection and Privacy Professionals

India will increasingly require professionals who can help organisations establish and manage data protection programmes. Potential roles may include Data Protection Executive, Privacy Operations Executive, Privacy Compliance Specialist, Data Governance Specialist, Privacy Risk Specialist, Data Protection Auditor, Privacy Consultant, Data Protection Officer, Privacy Manager and Privacy Technology Specialist.

This emerging professional domain brings together: Law + Technology + Cybersecurity + Compliance + Governance + Operations.



> “The future of India’s digital economy will depend not only on how much data we create, but on how responsibly we protect it.”

18.57 Lakh Employees: A Preliminary Industry Benchmark

The Banking, Financial Services and Insurance sector provides an important example of the potential scale of India's data protection skill requirement.

A preliminary study covering selected organisations estimated approximately 18.57 lakh employees across public sector banks, selected private sector banks, Regional Rural Banks, NABARD, insurance companies, mutual funds, housing finance companies, finance companies and NBFCs, and the GIFT City financial ecosystem.

The estimate is illustrative rather than exhaustive, but it provides an important indication of the potential scale of the requirement.

THE KEY POINT

18.57 lakh employees
does not mean 18.57 lakh new data protection jobs.

The requirement must be understood differently

Mass Awareness and Reskilling



A large number of existing employees may require basic data responsibility training.

Operational Upskilling



Personnel handling significant volumes of personal data may require deeper operational skills.

RoleTransformation



Existing professionals in compliance, risk, HR, IT and operations may acquire additional privacy-related responsibilities.

New Specialist Employment



Dedicated privacy, data protection and governance roles are likely to expand.

The Opportunity Extends Far Beyond BFSI

Healthcare and Life Sciences: Hospitals, clinics, laboratories and digital health platforms handle highly sensitive information. Healthcare professionals and administrators will increasingly require skills in responsible data handling, controlled access, secure sharing and incident reporting.



IT and IT-ITeS: Software companies, BPOs, KPOs, cloud service providers and technology companies frequently process information belonging to clients and customers. This sector may require both mass awareness and advanced specialist privacy capabilities.



Retail and E-Commerce: Retailers and online platforms collect customer information, delivery addresses, transaction records and behavioural information.



Telecommunications: Telecom and digital communication services process information at enormous scale. Privacy and data protection will increasingly become important operational capabilities.



Education and EdTech: Schools, universities and digital learning platforms handle student, parent and employee information.



Manufacturing and MSMEs: Organisations increasingly maintain employee records, customer databases, vendor information and digital systems



Professional Services: Doctors, lawyers, Chartered Accountants, consultants and other professionals frequently handle confidential client information.



The Opportunity Is Bigger Than New Jobs

The future data protection ecosystem should not be measured only by asking: "How many new jobs will be created?"

A better question is: "How many people will require new or enhanced data protection skills?"

The opportunity can emerge in four major forms:

1. Reskilling — Existing employees learn basic data responsibility.

2. Upskilling — Existing professionals develop deeper operational capability.

3. Role Transformation — Existing functions such as compliance, HR, IT and risk management acquire additional privacy responsibilities.

4. New Employment — Dedicated privacy and data protection roles emerge.



India can therefore create a structured professional pathway:

Basic Awareness → Operational Capability → Professional Expertise → Leadership and Governance

A Common Foundation with Sector-Specific Skills

A single generic training programme may not be suitable for every industry.

The most effective model may be a Common National Foundation — "Basic Data Responsibility at Workplace" — followed by sector-specific specialisation in Banking and Financial Services, Insurance, Healthcare, IT and IT-ITeS, Telecom, E-Commerce and Retail, Education, Manufacturing and MSMEs, and Professional Services.

The Way Forward

India has the opportunity to build a new ecosystem around:

DATA PROTECTION + PRIVACY + SKILLS + EMPLOYMENT + DIGITAL TRUST



The DPDP framework should therefore be viewed not only as a compliance challenge. It can also become a catalyst for workforce reskilling, professional development, new occupational roles, sector-specific training, industry capacity building and a stronger culture of digital responsibility.

THE VISION



- Every person handling personal data should understand basic data responsibility.
- Every organisation should have access to trained data protection capability.
- Every major sector should develop industry-relevant privacy skills.
- A Digital India must also become a Privacy-Ready India.

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www.business-standard.com/industry/banking/psu-banks-employee-count-rises-first- me-five-years-private-banks-drop-125123000953_1.html

Beyond the Prompt:

AI as a Co-Pilot for Building India's Future Skills

How Artificial Intelligence can move beyond productivity to become a strategic instrument for capability design — connecting policy, industry, institutions and human potential across India's skill development ecosystem.



The Question We Should Be Asking

Artificial Intelligence is reshaping how we work. But its most consequential contribution to skill development may not be helping us teach faster — it may be helping us think more clearly about what needs to be taught.

Traditional skill development begins with a familiar question: What skills are required? A future-oriented approach demands a larger one: What capabilities will India's industries, institutions and workforce need to build for the next phase of growth?

The distinction matters profoundly. A skill gap tells us who needs training today. A capability gap tells us what the ecosystem needs to become capable of doing — spanning technology, industry demand, institutional strengths, infrastructure, policy priorities, geography, certification, innovation and sustainability. Capability thinking demands that we understand not just who needs training, but what the entire ecosystem must become capable of doing for the next phase of India's growth.

Skill Gap
Who needs training today?

Capability Gap
What must the ecosystem become capable of doing?

AI as the Connector, Not Just the Tool

Building a capability ecosystem demands the synthesis of vast, fragmented information across many dimensions simultaneously. The challenge is not collecting this information — the challenge is connecting it. AI enables this connection at a scale and speed that was previously impossible.

Industry Trend Mapping
By mapping emerging technologies against sector-specific requirements and demand cycles, AI can surface industry trends that would take teams of analysts months to assemble.

Certification Alignment
By identifying emerging occupations and aligning them with recognised standards and pathways, AI ensures new capabilities are legible to employers, institutions and individuals — translating workforce development into credentials that carry real currency.



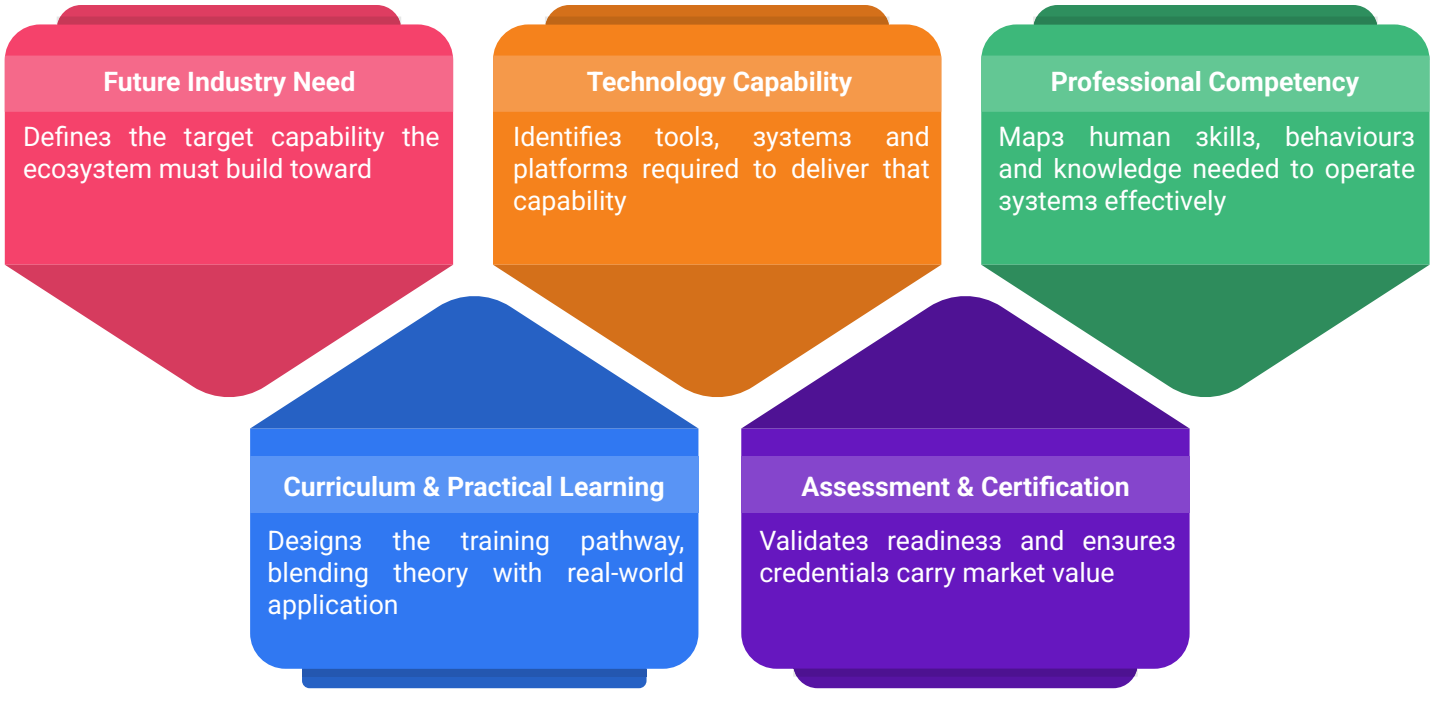
Technology Roadmapping
AI traces national and state priorities against institutional infrastructure and workforce pipelines — revealing not just where skills are needed today, but where they will be needed as policy and technology evolve.

Revealing Capability Gaps
AI surfaces patterns across data sets that no single expert or institution could hold in view simultaneously, making it possible to see the ecosystem as a whole rather than as a collection of disconnected parts.

AI's greatest value lies not in generating answers, but in helping experts see relationships that would otherwise remain invisible. The human expert still makes the judgement. AI makes it possible to examine the problem faster, wider and more systematically.

Capability Before Curriculum: Reversing the Sequence

One of the most important shifts AI enables is **reversing the traditional sequence** of curriculum development. Instead of asking **"What can we teach today?"** — we ask *"What will industry need to be able to do tomorrow?"* — and work backwards from that answer. This approach also creates a **continuum of development** — from technician and engineer to specialist, expert, practitioner and mentor — rather than treating training as a one-time intervention.



The principle is simple but transformative: **design the capability first, then design the training around it.**

From Centre of Excellence to Living Ecosystem

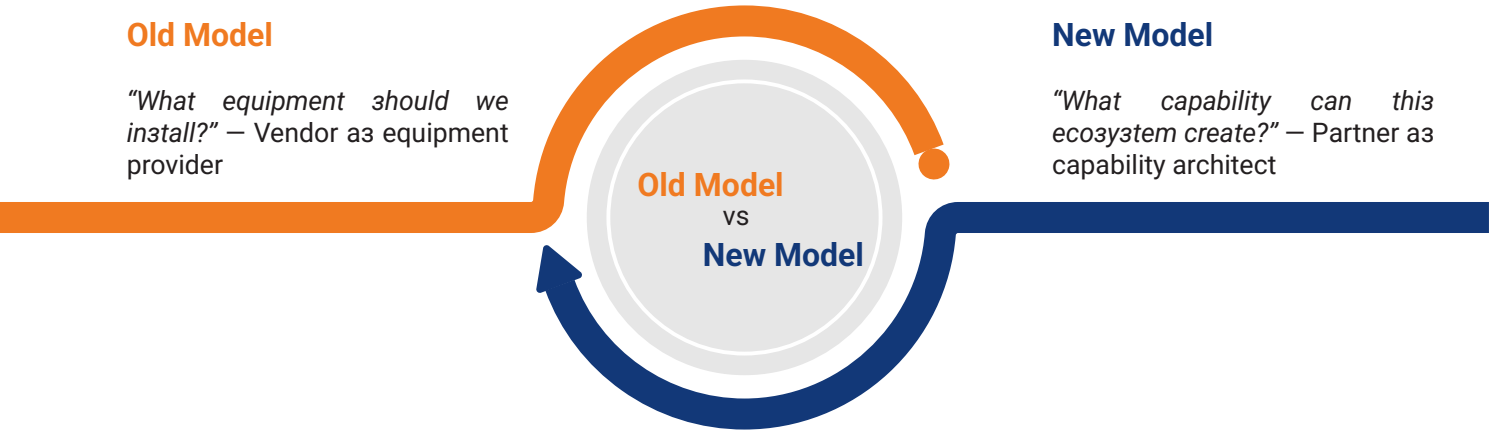
The Centre of Excellence of the future should not simply be a building that teaches. It should be a system that learns.

This demands a continuous feedback loop — one where industry requirements inform data, data informs learning design, learning builds capability, and real-world application feeds insights back into the system. AI and digital infrastructure accelerate every stage of this loop, making Centres of Excellence more responsive, more relevant and more aligned with the pace of industrial change.

This shift also redefines the role of technology partners. The old model positioned vendors as equipment providers who install, maintain and depart. The new model demands capability partners — organisations that bring expertise, standards, certification and real-world industrial exposure into the ecosystem on an ongoing basis.

Old Model

"What equipment should we install?" — Vendor as equipment provider



New Model

"What capability can this ecosystem create?" — Partner as capability architect

India's Larger Opportunity

Much of today's conversation focuses on AI literacy — teaching people how to use AI tools effectively. That is necessary. But it is insufficient on its own. The larger opportunity is AI-assisted capability design: using AI not merely as a productivity tool, but as a strategic instrument to connect policy with industry, technology with skills, institutions with opportunity, and training with future employment.



India's opportunity is not simply to use AI to train more people. It is to use AI to design better pathways — ones that are more relevant, more adaptable, and more precisely calibrated to where the economy is heading.

The future of skill development will not be measured only by how many people we train. It will increasingly be measured by how relevant, adaptable and future-ready the capabilities we create truly are. That is where AI moves beyond the prompt — from a productivity tool to a co-pilot for building India's future workforce.

AI Literacy

Addresses the individual — equipping workers and students to operate AI tools in their daily roles. It is the floor, not the ceiling.

AI-Assisted Capability Design

Addresses the ecosystem — using AI to architect the pathways between policy, industry, institutions and human potential at a national scale.

The Co-Pilot Model: Human Judgement, AI Vision

The Co-Pilot Model is not about replacing human expertise. It is about extending it. Human experts exercise judgement; AI enables them to see further, faster and more systematically than was ever before possible.

Planners & Policymakers

Can assess capability gaps across entire sectors — not just individual institutions — and align investments with where demand is genuinely heading.

Industry Partners

Can articulate future workforce requirements with greater precision, moving beyond generic job descriptions to specific capability profiles.

Training Institutions

Can design curricula that are continuously updated in response to real-world signals, rather than locked into periodic review cycles.

Individuals

Can navigate clearer, more credible pathways from training to employment — with certifications that reflect genuine market demand.

The Co-Pilot Model ultimately asks us to reimagine what skill development infrastructure looks like in an AI-enabled world — not as a system that delivers training, but as a system that continuously designs, validates and evolves capability in step with India's industrial ambitions. That is the promise of AI beyond the prompt.

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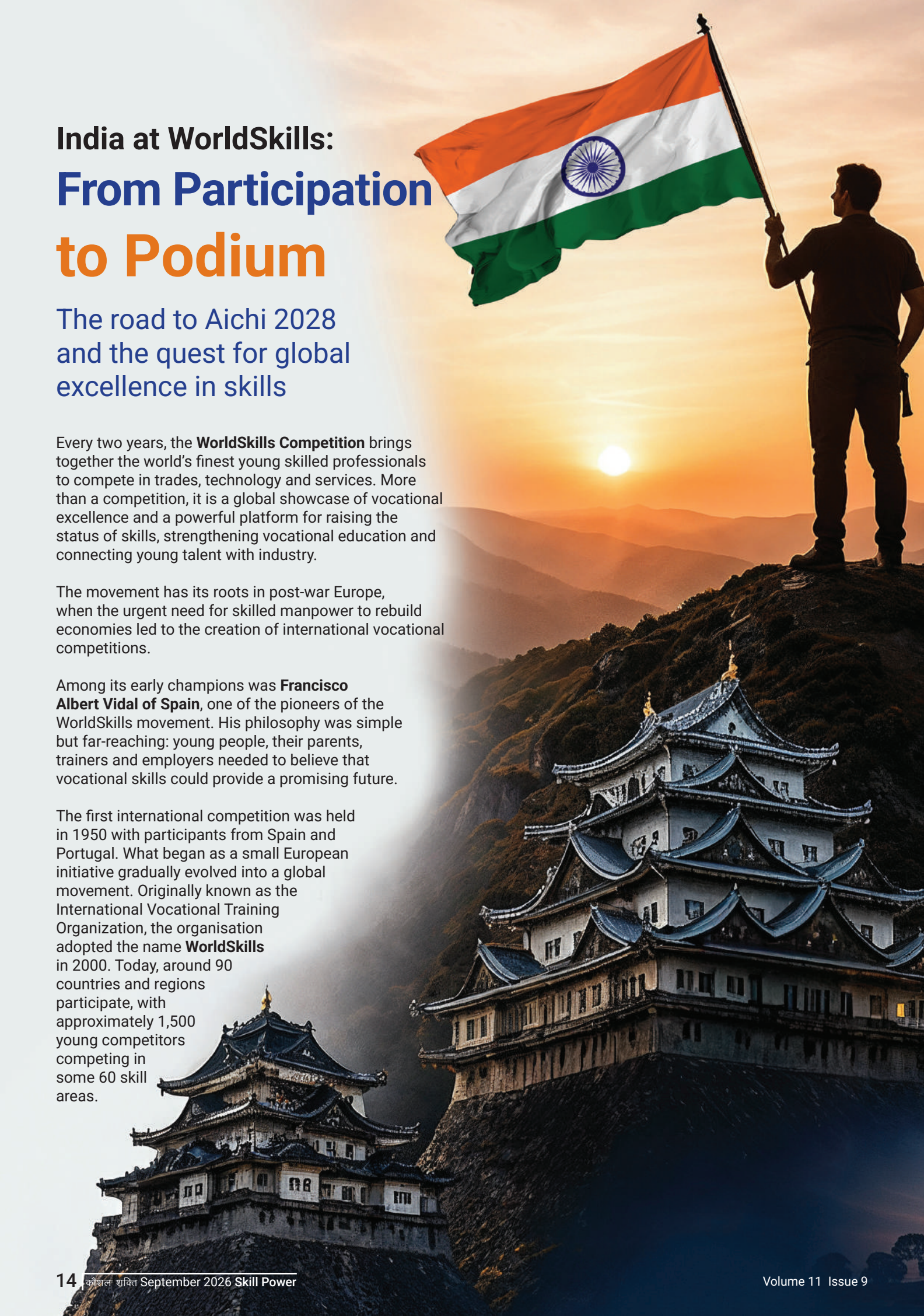




India at WorldSkills:

From Participation to Podium

The road to Aichi 2028 and the quest for global excellence in skills



Every two years, the **WorldSkills Competition** brings together the world's finest young skilled professionals to compete in trades, technology and services. More than a competition, it is a global showcase of vocational excellence and a powerful platform for raising the status of skills, strengthening vocational education and connecting young talent with industry.

The movement has its roots in post-war Europe, when the urgent need for skilled manpower to rebuild economies led to the creation of international vocational competitions.

Among its early champions was **Francisco Albert Vidal of Spain**, one of the pioneers of the WorldSkills movement. His philosophy was simple but far-reaching: young people, their parents, trainers and employers needed to believe that vocational skills could provide a promising future.

The first international competition was held in 1950 with participants from Spain and Portugal. What began as a small European initiative gradually evolved into a global movement. Originally known as the International Vocational Training Organization, the organisation adopted the name **WorldSkills** in 2000. Today, around 90 countries and regions participate, with approximately 1,500 young competitors competing in some 60 skill areas.

India's WorldSkills Journey

India joined WorldSkills International on **4 July 2007**, becoming its 48th member, and entered its first Competition that year.

Since 2011, **WorldSkills India**, an initiative of the National Skill Development Corporation (NSDC) under the Ministry of Skill Development and Entrepreneurship (MSDE), has been responsible for India's participation. Its role covers the complete journey—from identifying talented young competitors and organising selection to intensive training and preparing **Team India** for international competition.

The foundation of this process is the **IndiaSkills Competition**, a national pyramid that begins at the district level and progresses through state and regional competitions to the national stage.

The scale of participation demonstrates the depth of India's talent pool. In the 2025–26 cycle, more than **3.65 lakh young people from 36 States and Union Territories** participated, with over 650 of the country's top competitors eventually competing across 63 skill categories.



Equally significant is the changing nature of these skills. Traditional disciplines such as welding and floristry now stand alongside **Autonomous Mobile Robotics, Cyber Security, Optoelectronic Technology and Industry 4.0**.

The message is clear: India's definition of vocational excellence is evolving with technology and industry.

From National Champions to Team India

Winning at IndiaSkills is only the beginning for those selected for international representation.

The finalists undergo intensive, often year-long preparation involving WorldSkills Experts, international trainers, industry specialists and psychological conditioning. Exposure visits to countries such as Japan, South Korea, Austria and Switzerland provide competitors with an understanding of international training practices, technologies and workplace standards.

The objective is to take a talented young Indian and prepare that individual to perform with the precision, speed, quality and consistency expected at the world's highest level of skills competition.

Lyon 2024: A Stronger India

India's performance at the 47th WorldSkills Competition in Lyon, France, from 10–15 September 2024, was a significant milestone.

60 COMPETITORS
across 52 skill categories

16 AWARDS
four Bronze Medals and 12 Medallions of Excellence.

The result reflected the steady strengthening of India's skills ecosystem and the growing ability of Indian competitors to match international standards.

But the next challenge is more demanding.



India Addresses The Industry 4.0 Gaps

India has made impressive progress in several traditional and established skills. However, in some of the most advanced technology-intensive disciplines, particularly those associated with **Industry 4.0**, podium finishes have remained elusive.

This is an important gap because these are precisely the skills that will define the next generation of manufacturing and industrial employment.

Industrial automation, robotics, artificial intelligence, machine vision, smart sensors, digital manufacturing, industrial networks, cybersecurity and connected production systems are transforming factories around the world.

To compete successfully in these disciplines, India needs more than excellent vocational training. Competitors require sustained exposure to the l**atest industrial technologies, equipment and real-world production environments**, backed by close collaboration between training institutions, Sector Skill Councils, technology companies and employers.

This is perhaps the most important lesson emerging from India's WorldSkills journey.

Aichi 2028: The Opportunity

The **WorldSkills Competition Aichi 2028 in Japan** offers India a natural next target.

Japan's global leadership in precision manufacturing, automation, robotics, quality systems and advanced industrial technology makes Aichi an especially appropriate venue for the next stage of India's skills journey.

India should therefore approach Aichi 2028 not simply as another competition, but as a **national mission for excellence in future skills.**

The ambition should be clear: **a larger and stronger Team India, supported by deeper industry participation, world-class training infrastructure and intensive preparation in advanced technologies—with particular emphasis on Industry 4.0 disciplines.**

India has the ingredients: a huge young talent pool, a rapidly expanding manufacturing and technology sector and an increasingly structured national skills ecosystem.

What is needed now is to connect these strengths more closely.

From Participation to Leadership

India's WorldSkills journey has come a long way since 2007. The country has built a national competition structure, dramatically expanded participation and demonstrated its ability to compete successfully on the international stage.

The next phase must be about converting this progress into **consistent podium performance and, ultimately, global leadership**.

The true value of WorldSkills, however, extends beyond medals. Every competitor trained to international standards becomes a potential trainer, technician, entrepreneur, expert or industry professional capable of transferring knowledge to many others.

That is why the road to Aichi 2028 matters.

The objective is not merely to produce WorldSkills champions. It is to build a generation of **globally competitive, technologically proficient and industry-ready young Indians** who can power the manufacturing and services industries of the future.

By Dalel Singh
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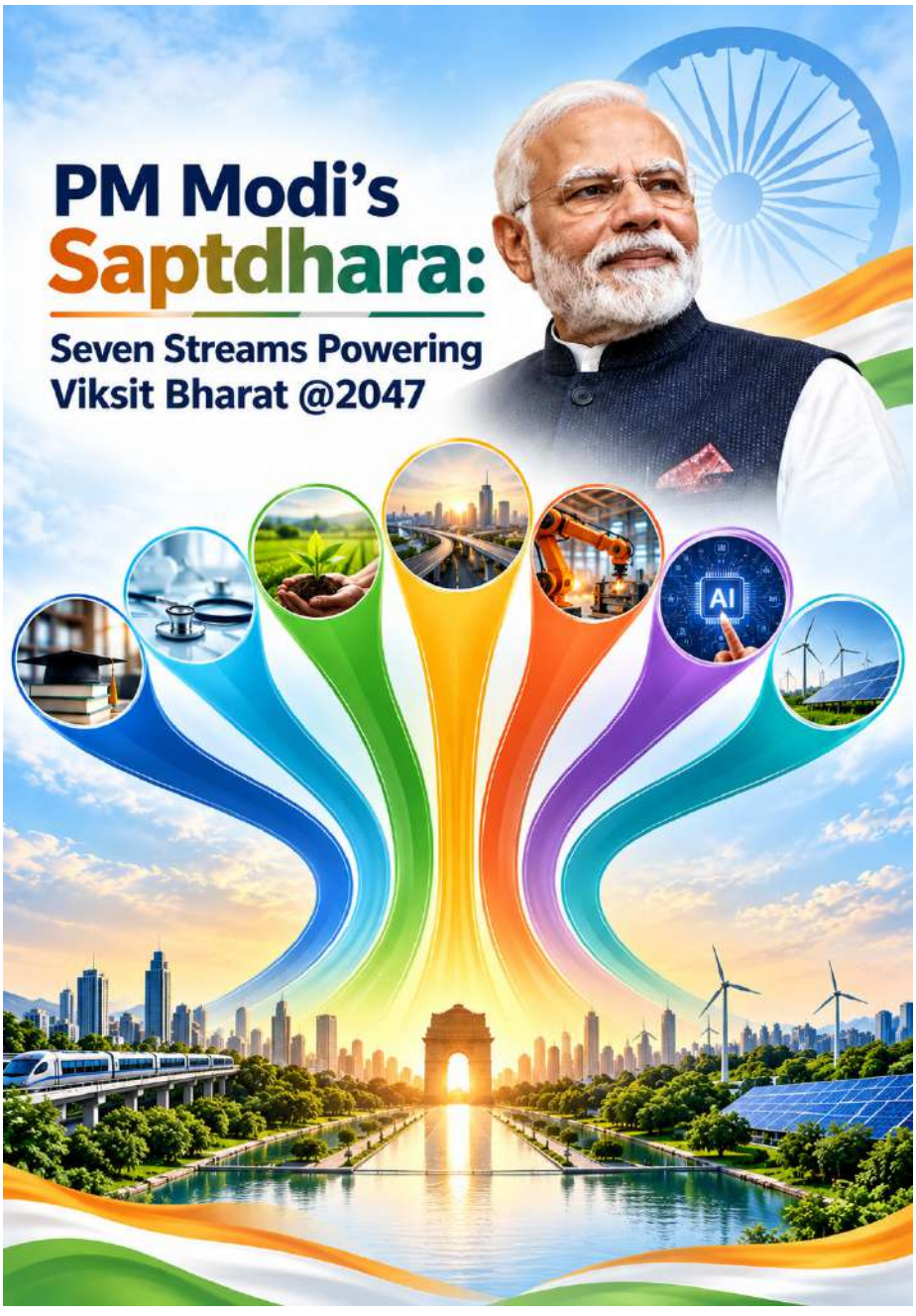
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A Strategic Assessment of Concept, Impact, Employment and Skills

Executive Summary

On 15 August 2026, from the ramparts of the Red Fort on India's 80th Independence Day, Prime Minister Narendra Modi unveiled a new national growth doctrine - Shakti ki Saptdharas or Seven Streams of Strength. Framed as the operational roadmap to Viksit Bharat by 2047, it moves beyond sectoral schemes to a converging seven-pillar framework.

This article deconstructs the concept, analyses its macro and sectoral impact, quantifies its employment generation potential, and maps the skilled resource requirement, with special focus on the Instrumentation, Automation, Surveillance and Communication (IASC) sector which is the technical backbone of almost all seven streams.

1 THE CONCEPT OF SAPTDHARA

Prime Minister Modi positioned Saptdhara as a civilizational continuity - from the ancient Saptasindhu to the modern Saptadhara, seven streams that will carry India to developed nation status.

The Prime Minister invoked "Shakti ki Saptdharas" or "Seven Streams of Strength" — manufacturing, agriculture and food processing, technology and innovation, Gati Shakti, defence, the green and blue economy, and soft power — as pillars to propel India towards greater heights.

Each stream was defined with a clear intent:

1 Manufacturing Shakti

To build complete domestic end-to-end value chains, from design to components, with focus on zero-defect quality, cost, and global scale. As elaborated, "We want to create for the entire value chain, from components to big manufacturing. I want to stress on three things for the manufacturing sector. Cost, quality, and scale... zero-defect manufacturing should be our identity".

2 Agriculture and Food Processing

To create integrated farm-to-export supply chains for millets, spices, and fruits while transitioning to chemical-free farming. This is not just farm productivity but value capture.

3 Technology and Innovation Shakti

Must take India from being a technology market to a global innovation hub, with leadership in artificial intelligence, quantum technology, space, robotics, digital public infrastructure and Made-in-India 6G. The PM noted "Today it is the era of space, quantum, robotics... Made in India 6G should reach all corners".

4 Gati Shakti

Seamless, high-speed multimodal logistics linking cities, highways, railways, airports and modern industrial ports. Ports-led development, high-speed rail, inland waterways and multi-modal logistics parks are central.

5 Raksha Shakti / Defence Self-Reliance

Complete strategic self-reliance by pioneering and exporting next-gen defence technologies such as drones, counter-drone systems, and hypersonics. “To be self-reliant in defence is an imperative... We have to develop drones, hyper-sonic technologies”.

6 Green and Blue Economy Shakti

Drive sustainable growth through green hydrogen, renewable energy, and energy storage, while unlocking India’s ocean, coastal, and marine potential. Green mobility, green manufacturing and solutions to global warming were stressed.

7 Soft Power Shakti

Globalise Indian culture, Yoga, Ayurveda and tourism, while building leadership in gaming, visual effects, animation and the wider creative economy. The PM specifically linked Yoga, Heal in India, films, gaming, 100+ national parks and the concert economy to this stream.

In support of the framework, the government announced parallel missions: 1 crore youth to be trained in AI over the next year via nationwide mission mode, free online coaching for youth, 7–8 new semiconductor production plants to operationalize within 1–2 years, and a target of 100 GW nuclear capacity by 2047.

2 IMPACT ANALYSIS OF SAPTDHARA

Saptdhara is significant because it reframes Viksit Bharat from a GDP target to a capability-building framework.

A. Economic Structural Impact:

Earlier reforms were siloed. Saptdhara forces convergence. For example, manufacturing (Stream 1) + Gati Shakti (Stream 4) + Green Economy (Stream 6) together mean zero-defect, low-carbon factories connected to ports with sub-24 hour logistics. This directly addresses India’s historic cost disadvantage in logistics (13-14% of GDP vs 8% global benchmark).

Manufacturing output has already shown momentum - electronics manufacturing has expanded nearly sevenfold, mobile phone production 33-fold in the last 12 years as cited in the speech. Saptdhara institutionalizes this into end-to-end value chains - not just assembly but design, components, materials and testing within India.

B. Technology Sovereignty Impact:

By placing Technology and Innovation and Defence as separate streams, the doctrine makes a decisive shift from technology consumer to technology creator. The emphasis on AI, quantum, robotics, DPI, 6G and hypersonics means public R&D, private deep-tech startups and strategic sectors are aligned. The semiconductor push - 7-8 new plants - is the foundation for both.

C. Rural and Agri-Value Impact:

Agriculture moves from subsistence narrative to export competitiveness. Farm-to-export chains for millets and spices, chemical-free farming and food processing parks will impact 46% of workforce still dependent on agriculture, raising farm incomes and reducing post-harvest losses estimated at Rs 1.5 lakh crore annually.

D. Environmental and Maritime Impact:

Green and Blue economy integration is timely. Green hydrogen, storage and renewables create a new energy economy, while blue economy unlocks coastal tourism, fisheries, deep-sea minerals and shipbuilding - sectors where India holds 7,500 km coastline advantage but under 1% of global share.

E. Cultural Economy Impact:

Soft power is no longer peripheral. Gaming, AVGC (Animation, Visual Effects, Gaming, Comics), Ayurveda wellness tourism, and concert economy are high-margin, job-intensive global industries where India’s cultural capital is an economic asset.

Overall, Saptdhara impacts three levels: productivity (cost, quality, scale), resilience (self-reliance in chips, defence, energy), and narrative (from market to maker, from follower to standard-setter).

3 EMPLOYMENT GENERATION POTENTIAL

Saptdhara is fundamentally a jobs strategy. Each stream is labour-intensive if skilling is synchronized.

Manufacturing: PLI schemes already generated 8 lakh direct jobs. Full value chain manufacturing (components, precision tools, packaging) can generate 2.5-3 jobs per 1 lakh investment in MSMEs vs 0.7 in heavy industry. Precision manufacturing demands tool room operators, CNC programmers, quality inspectors - all NSQF Level 4-6 roles.

Agriculture & Food Processing: Food processing is a 2x employment multiplier over primary agriculture. Integrated cold chains, grading, packaging, traceability and export compliance can create 9 million additional jobs by 2030 in Tier 2/3 towns.

Technology & Innovation: The 1 crore AI training mission signals the scale. AI, robotics, space and 6G will create two layers of jobs: high-end R&D (AI engineers, quantum researchers) and mid-tier deployment (drone operators, IoT installers, data centre technicians).

Gati Shakti: Infrastructure construction generates 70 jobs per crore in roads and logistics. Multimodal parks, port modernization, high-speed rail maintenance will need permanent operations staff.

Defence: Atmanirbhar defence production nearly fourfold in last decade. Drones, counter-drone systems, cybersecurity - these are MSME-heavy and require electronics integration, composite fabrication, software testing.

Green and Blue: Green hydrogen plants, solar module manufacturing, battery storage and EV ecosystem can generate 3.5 million green jobs by 2030 per Skill Council for Green Jobs estimates. Blue economy - marine fisheries, aquaculture, coastal logistics, ship repair - is an additional 2 million livelihood potential in coastal districts.

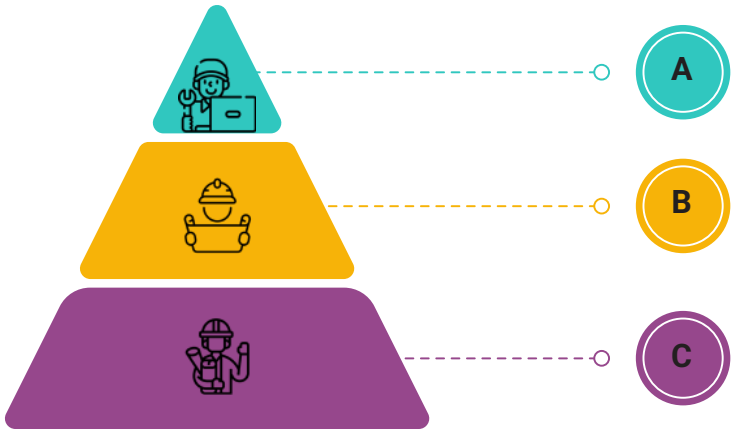
Soft Power: AVGC, wellness, tourism and concert economy are youth-centric. AVGC alone is projected to create 2 million jobs by 2030, mostly for creators under 35.

Collectively, if executed, Saptdhara could help absorb the 7-8 million youth entering workforce annually, while shifting workforce from informal low-productivity to formal high-productivity roles.

4 SKILLED RESOURCES REQUIRED - GENERAL AND IASC SPECIFIC

General Skill Architecture: Nasscom estimates about 40% of India's total workforce has to be reskilled over the next five years to cope with emerging trends such as AI, IoT, machine learning and blockchain. With total workforce near 500 million, at least 200 million need reskilling.

Saptdhara demands a pyramid



NSQF Level 3-4: Technicians, operators, fitters, wiring harness, cold chain handlers, logistics coordinators

NSQF Level 5-6: Specialist engineers, system integrators, automation experts

NSQF Level 7-8: Designers, R&D leads, architects of systems

The gap is not just numbers but relevance. Traditional ITI curricula cover manual trades; Saptdhara needs cyber-physical skills.

Specific Focus: Instrumentation, Automation, Surveillance and Communication (IASC) Sector

The IASC sector is the cross-cutting enabler. The growing demand for skilled workforce in the field of instrumentation, automation, surveillance and communication is a significant growth driver... The rapid growth in the industrial sector, including oil and gas, power and manufacturing, has resulted in a significant demand for skilled professionals.

The Instrumentation Automation Surveillance & Communication Sector Skill Council (IASC SSC) lists critical job roles that map directly to Saptdhara:

Key NSQF Level 6-7 roles include Pneumatic, Hydraulic & Motion control Specialist, Manager- System Integration, DCS Specialist, Process Automation Engineer, Sensor Technology & Application Expert, Bio Medical Instrumentation Specialist, Green Automation Expert, Smart Farming (Farm Automation) Expert, Physical Security and Surveillance Specialist, Drone Design & Manufacturing Engineer, Communication & Broadcasting Technologist.

Minimum educational benchmarks reflect the sophistication: e.g., Surveillance System Engineering at NSQF Level 6 is aligned to BE/B.Tech in Electronics with 5 years experience OR ME/MTech with 4 years in Surveillance, Security, Automation, Instrumentation.

Stream-wise IASC Skill Mapping

Manufacturing

Demand for PLC, SCADA, DCS programmers, Industrial IoT sensor calibration, predictive maintenance experts, zero-defect quality instrumentation technicians (Pressure/Level/ Flow, Control Valve technicians).

Agriculture

Smart Farming experts, soil sensor network technicians, automated irrigation controllers, cold chain instrumentation for food processing.

Technology & Innovation

Embedded systems, robotics integration, 6G test and measurement engineers, AI on edge devices for surveillance.

Gati Shakti

Intelligent Transportation Systems (ITS) engineers, port automation, railway signaling and SCADA, warehouse automation and AGV controllers.

Defence

Drone Design & Manufacturing Engineer, counter-drone RF communication specialist, secure communication, cyber-physical security, electro-optic surveillance.

Green & Blue

Green Automation Expert for energy management, SCADA for renewable grids, energy storage BMS technicians, marine surveillance and underwater instrumentation.

Soft Power

Broadcast engineering, AVGC real-time rendering infrastructure, venue surveillance and crowd analytics, AR/VR instrumentation.

This implies India needs to scale IASC training from current thousands to lakhs per year, with strong emphasis on Recognition of Prior Learning (RPL), apprenticeship, and industry co-designed labs.



5 CHALLENGES AND WAY FORWARD

A. Skill-Industry Mismatch: Over 60% of IASC employers report difficulty finding DCS/PLC certified professionals. Curricula update cycle is 3-4 years; technology cycle is 9-12 months.

B. Faculty and Trainers: Lack of certified trainers for Level 6-7 roles. A good automation trainer needs both pedagogy and shop-floor experience.

C. Infrastructure Cost: Automation labs with ABB/Siemens PLCs, Honeywell DCS, drone flight labs, 6G testbeds are capital intensive (Rs 2-5 crore per lab).

D. Geographic Concentration: Skilling infrastructure is urban; Saptdhara's impact needs to be in aspirational districts, coastal clusters, border areas.

E. Convergence Failure Risk: Without Centre-State-Industry convergence, seven streams may become seven silos. Gati Shakti's success depends on railways, highways, ports data integration - a surveillance and communication challenge itself.

F. Global Competition and Standards: Zero-defect manufacturing requires global certification (CE, UL, ISO 26262 for automotive, etc.). Indian skilled workforce must be certified to those global norms.

WAY FORWARD - A 5-POINT ACTION PLAN

1. Mission-Mode IASC Skill Stack: Create a Saptdhara Skill Stack under NSQF - common foundation in Instrumentation (Level 3-4), branching to Automation, Surveillance, Communication at Level 5-7. Integrate with AI mission (1 crore youth) to ensure every automation engineer is AI-aware.

2. Industry-Led CoE Model: For every semiconductor plant announced, mandate an adjacent Centre of Excellence for instrumentation and automation run by IASC SSC with chip companies. Similar CoEs for drones in defence corridors (UP, Tamil Nadu), for smart farming in Punjab, Maharashtra, for green automation in Gujarat, for blue economy in Kochi and Visakhapatnam.

3. Apprenticeship 2.0: Expand NAPS to include long-term (12-18 month) apprenticeships in DCS Specialist, System Integration Manager roles with stipend support. Use Paid RPL to certify existing workforce of 2 million technicians working informally in instrumentation.

4. Digital Labs and Simulation: To overcome cost, deploy digital twins of PLC, SCADA, DCS, surveillance command centres. A student can practice 80% on simulator, 20% on physical hardware. Link to SWAYAM and free online coaching platform announced.

5. Soft Power + Hard Tech Fusion: Encourage ITIs and Polytechnics to offer dual certification - e.g., Surveillance Technician + AVGC Content Management, or Communication Technologist + Concert Production Tech - to capture Soft Power jobs that need both tech and creativity

Finally, measurement. Saptdhara needs a dashboard - stream-wise capacity, employment, skill supply, export share - reviewed quarterly by PMO with states and industry. Without outcome-based funding for SSCs, it risks becoming rhetoric. Saptdhara, if executed with instrumentation, automation, surveillance and communication at its core, is not just seven programs. It is an operating system for a developed India. The concept gives direction, the impact will be structural, employment potential is massive, but the binding constraint is skilled resources. Investing in IASC skills is investing in the wiring of Viksit Bharat.

Nagendra Goel
Chairman BIPS Group and
Indo Nuclear Energy Group
cmd@indonuclear.in



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1. INTELLIGENT SECURITY TECHNOLOGY
2. AUTONOMOUS MOBILE ROBOTICS
3. INDUSTRIAL CONTROL
4. MECHATRONICS
5. OPTOELECTRONIC TECHNOLOGY



Age eligibility: Born on or after 1 January, 2006 (most skills)
Check Official Guideline for Skill Specific Age

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IASC CONNECT

Bringing Skills, People and Industry Together



The world of work is changing rapidly. Industrial technologies are evolving, new job roles are emerging, businesses are looking for more specialised skills, and professionals are expected to keep learning and adapting. In such an environment, the traditional boundaries between education, training, employment and industry are becoming increasingly blurred.

A student may start with a course, but what they really want is a good career. A professional may have the right qualification, but may need a new opportunity to use their skills. A company may have a job vacancy, but what it really needs is the right person with the right skills. A training institution may have good programmes, but it can create much greater impact when it is closely connected with industry. This is where IASC Connect comes in.

Currently under development and preparing for its launch, IASC Connect is being created by the Instrumentation, Automation, Surveillance & Communication Sector Skill Council (IASC SSC) as a new digital platform for the wider industry community.

The idea is simple: bring people, companies, training organisations, experts and opportunities together in one place. IASC Connect is not being planned as just another job portal or training website. It is being designed as a connected industry community where people can find jobs, learn new skills, work on projects, discover business opportunities, build partnerships, attend events and connect with others working in the industry.

More Than a Job Portal

Today, people often have to use different websites for different needs. They use one platform to find a job, another to learn a course, another to attend an event and another to find professional contacts. But real careers and businesses do not work this way.

A young engineer may complete a training programme, work on an industry project, earn a certification, find an apprenticeship and then get a job. Later, that same engineer may become a trainer, consultant or mentor.

In the same way, a company may need to hire people, train its employees, find a technology partner, work with a consultant or take up a new industrial project.

All these activities are connected. IASC Connect aims to bring these connections together.



Connecting Learning with Careers

One of the main goals of the platform is to make learning more useful and connected to real career opportunities. A learner interested in industrial automation, for example, could discover a learning path that takes them from basic automation knowledge to PLC programming, SCADA, industrial networking and Industrial IoT.

But the journey would not stop with training. The platform can connect learning with assessments, certifications, practical industry projects, apprenticeships and jobs.

This creates a simple pathway:

Learn a skill.

Prove the skill.

Use the skill.

Gain experience.

Find an opportunity.

Build a career.



This approach can help learners understand not only what they should study, but also where those skills can take them.

Creating More Opportunities

Jobs will be an important part of IASC Connect, but the platform looks at opportunity in a much wider way. A company may need a full-time automation engineer. Another may need a specialist for a three-month SCADA project. A startup may be looking for a manufacturing company to test a new Industrial IoT product. A training institution may be looking for an industry expert. A business may be searching for a distributor or technology partner. These are all opportunities.

IASC Connect aims to create an environment where such requirements can be posted, discovered and matched with the right people and organisations. This can be especially useful for professionals, consultants, startups and MSMEs that may have valuable skills and services but do not always have easy access to new customers or projects.



Building an Industry Community

A successful industry platform needs to be more than a list of jobs and courses. It needs a community. IASC Connect is being designed to help people stay connected with their industry. Users will be able to discover experts, participate in discussions, follow industry developments, attend webinars and events, and share knowledge and experiences.

A student may learn from an experienced engineer. A professional may discover a new technology through an industry discussion. A company may meet a potential partner through an event. A startup may find its first industry customer through a community connection. Small connections can sometimes lead to much bigger opportunities.

Helping Companies Find the Right People

For employers, finding the right talent is often as important as creating jobs. IASC Connect can help companies discover people based on their skills, qualifications and experience rather than relying only on traditional resumes.

Employers can also use the platform to connect with training providers, post projects, find consultants, support apprenticeship programmes and explore partnerships. This can help create a stronger connection between what industry needs and what the workforce is learning.

Supporting Partnerships and Business Growth

Industry growth depends on collaboration. Companies need technology partners. Startups need customers and pilot projects. Training institutions need industry relationships. Professionals need opportunities to work together.

IASC Connect aims to make these connections easier. Through the platform, organisations can potentially find training partners, technology companies, consultants, implementation partners, research partners and other businesses with complementary capabilities.

The objective is simple: make it easier for the right people and organisations to find each other.

Looking Towards the Future



Another important area for IASC Connect is industry information and intelligence. As the platform grows, information from jobs, skills, projects, training and industry requirements can help provide a better understanding of changing market needs.

Which skills are becoming more important? Which technologies are growing? Where are companies facing skill shortages? What kinds of jobs are emerging? Such information can be useful for students, professionals, employers, training organisations and policymakers.

Artificial intelligence can further help users find relevant opportunities, understand skill gaps and identify possible career or business pathways.

A Connected Future

The real value of IASC Connect will not simply be measured by the number of users, jobs or courses on the platform. Its success will be seen in the connections it creates and the outcomes that follow.

That is the larger vision behind IASC Connect. It is about creating a digital space where people can connect, learn, work, build and grow.

As the platform moves towards its launch, IASC Connect has the potential to become more than a digital service. It can become a growing industry community that brings together skills, people, businesses and opportunities. Because the future of industry is not only about technology. It is about people being connected to the right skills, the right knowledge and the right opportunities at the right time.

A student finding an internship.

A professional finding a project.

A company finding the right engineer.

A startup finding a partner.

A training institution finding an employer.

An expert mentoring a young professional.



Two organisations coming together to create something new.

IASC Connect — Where Skills Meet Opportunity.

Launching Soon

Atul Garg

Atul Garg is an experienced technology and transformation professional with over three decades of work across e-governance, project management, procurement, education, internal security, and emerging technologies.

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SEMICONDUCTORS

INDIA'S NEXT STRATEGIC OPPORTUNITY

From Technology Dependence to Global Semiconductor Power

A policy, industry and skills perspective—with a special focus on the IASC Sector Skill Council

THE NEW STRATEGIC RESOURCE

The 21st-century economy runs on semiconductors. Smartphones, automobiles, medical equipment, telecom networks, satellites, defence systems, renewable-energy systems, robots, data centres and artificial intelligence all depend on chips. Semiconductor capability is therefore no longer only an industrial issue; it is an issue of economic competitiveness, national security and technological sovereignty.

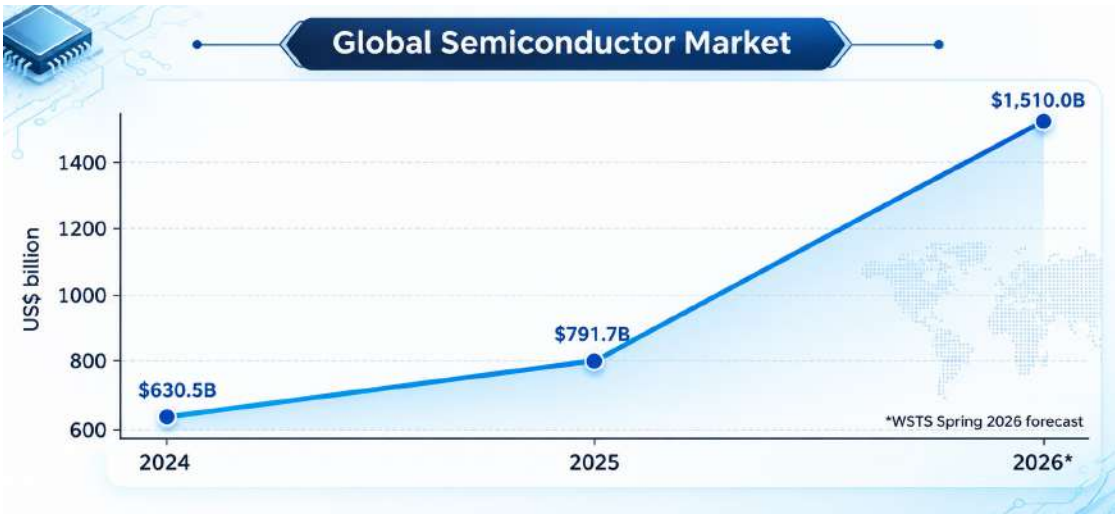
The global semiconductor market reached US$791.7 billion in 2025. The World Semiconductor Trade Statistics (WSTS) Spring 2026 forecast projected the market to reach about US$1.51 trillion in 2026, driven strongly by memory, AI infrastructure and accelerated computing. [1][2]

For India, the opportunity is to move beyond importing chips and become a complete participant in the value chain: design, fabrication, packaging, testing, equipment, materials and applications.

WHY SEMICONDUCTORS MATTER

Semiconductors sit at the intersection of almost every strategic technology. AI requires processors, accelerators, memory and networking chips. Electric vehicles require power electronics and sensors. Defence systems require secure and reliable electronics. Industrial automation requires controllers, sensors, communications and embedded computing.

A semiconductor plant is itself a highly automated Industry 4.0 environment. It depends on sensors, instrumentation, PLCs, SCADA, robotics, machine vision, industrial communication, manufacturing execution systems, predictive maintenance and stringent process control. This makes semiconductor manufacturing particularly relevant to the Instrumentation, Automation, Surveillance and Communication (IASC) Sector Skill Council.



WHAT INDIA LOST BY BEING LATE

India developed strong scientific and engineering capabilities and became a major centre for semiconductor design and engineering services. However, commercial-scale semiconductor manufacturing did not develop at the same pace as in Taiwan, South Korea, Singapore or China.

The opportunity cost was much larger than the value of imported chips. India missed opportunities in fabrication, semiconductor equipment, materials, packaging, testing, specialised manufacturing, industrial R&D and high-value manufacturing employment. The country also became vulnerable to concentrated global supply chains.

The reasons were structural: fabs require enormous capital; technology changes rapidly; manufacturing needs ultra-clean environments, reliable utilities and specialised materials; and a fab becomes competitive only when surrounded by a strong supplier and customer ecosystem. Historically, India's electronics market was also not large enough in some segments to justify the required scale of investment.

The important point is that India's position has changed. A large electronics industry, strong engineering base, expanding automotive and EV sectors, defence demand, data centres and AI are creating a much larger domestic market.

INDIA'S SEMICONDUCTOR MOMENT

India has moved from policy intent to project execution. The Government's semiconductor programme has now entered a second phase. Semicon 2.0, approved in July and notified in August 2026, has an outlay of ₹1,27,500 crore and six pillars: design; semiconductor machines and materials; fabrication; ATMP/ OSAT; R&D; and talent. [3]



As of June 2026, Government reporting listed 12 approved semiconductor manufacturing projects with an investment pipeline of about ₹1.64 lakh crore, including one fab, two compound-semiconductor fabs and nine packaging projects. Three had started commercial production. [4]

This is significant because semiconductor self-reliance cannot be achieved by building fabs alone. India needs an ecosystem around each fab and packaging facility: equipment, chemicals, gases, precision engineering, utilities, automation, maintenance, testing, logistics, R&D and skilled manpower.

CONSTRAINTS WE MUST SOLVE

MANPOWER: Semiconductor manufacturing requires specialised process, equipment, automation, instrumentation, cleanroom, quality, safety, packaging and testing professionals. The shortage of experienced technicians and supervisors can become a bottleneck.

FINANCE: Semiconductor projects require long-term capital and patient investment. Public incentives can catalyse investment, but competitiveness ultimately depends on productivity, yield, reliable infrastructure and a strong supplier ecosystem.

MARKET: India must create both domestic demand and export capability. Automobiles, EVs, telecom, defence, renewable energy, industrial electronics and data centres can anchor demand.

TECHNOLOGY: India should not attempt to duplicate every advanced node immediately. A portfolio approach—mature and specialty nodes, power semiconductors, sensors, automotive chips, compound semiconductors, packaging and advanced design—can build capability progressively.

ECOSYSTEM: Equipment, materials, chemicals, gases, water treatment, cleanroom services, precision engineering and maintenance must develop alongside fabs.





INDIA ROAD MAP: 2026–2040

2026–2028 | BUILD THE FOUNDATION: Bring approved projects into stable operation; create cleanroom and equipment training; expand ATMP/OSAT skills; build industry apprenticeships; and develop fab-automation curricula.

2028–2032 | BUILD THE ECOSYSTEM: Develop Indian equipment, materials and precision-engineering suppliers; strengthen advanced packaging, testing, semiconductor R&D and startups; and create regional semiconductor skill clusters.

2032–2035 | SCALE GLOBALLY: Target automotive, power, telecom, defence, sensors and industrial chips; export semiconductor services and equipment; and integrate Indian design with Indian manufacturing.

2035–2040 | GLOBAL SEMICONDUCTOR POWER: Position India among the world's leading locations for semiconductor design, manufacturing, packaging, equipment and talent.

IASC: THE SKILL OPPORTUNITY

The semiconductor factory of the future is one of the most automated industrial environments in the world. This creates a natural and substantial role for IASC.

Priority IASC-aligned occupations include Semiconductor Manufacturing Technician, Cleanroom Technician, Equipment Maintenance Technician, Instrumentation Technician, Automation Technician, PLC/SCADA Technician, Fab Automation Engineer, Process Control Engineer, Robotics Technician, MES/Industry 4.0 Engineer, Industrial Communication Specialist, Predictive Maintenance Specialist and Semiconductor Industrial Cybersecurity Specialist.

A powerful strategy is to reskill India's existing industrial workforce. An instrumentation technician can transition into semiconductor process instrumentation; a PLC technician into fab automation; a maintenance technician into semiconductor equipment maintenance; and an industrial safety professional into semiconductor chemical and cleanroom safety.

INDICATIVE EMPLOYMENT DEMAND IN IASC

The following is a planning estimate, not an official employment forecast. It should be validated through a structured industry demand survey covering fabs, ATMP/OSAT units, equipment suppliers, materials companies, utilities and electronics manufacturers.

Indicative IASC-aligned opportunity through 2035 is approximately 1.0–1.5 lakh professionals. The largest groups are expected to be manufacturing technicians, equipment maintenance, automation/PLC/SCADA, instrumentation/ process control, cleanroom/facility operations and robotics/material handling.

The opportunity extends beyond new entrants. India's existing industrial workforce can be reskilled into semiconductor operations, creating a much faster talent pipeline than relying only on fresh graduates.

THE IASC SEMICONDUCTOR SKILLS MISSION

IASC should consider launching a dedicated "Semiconductor Skills Mission – Skill India for Semicon India".

SEMICONDUCTOR SKILL CENTRES

cleanroom simulation, PLC/ SCADA, sensors, robotics, machine vision, industrial communication and semiconductor process simulation.

TRAIN-THE-TRAINER

a national pool of instructors with industry exposure

APPRENTICESHIPS

direct links between training centres, fabs, ATMP/OSAT facilities and equipment companies.

RESKILLING & RPL

certification of experienced industrial technicians moving into semiconductor manufacturing.

INDUSTRY CERTIFICATION

joint qualifications and assessments with semiconductor employers and technology partners.

The objective should not be "train one lakh candidates". It should be "create one lakh industry-ready semiconductor professionals"—measured by certification, apprenticeship, employment and career progression.

CONCLUSION

India may have missed the first great semiconductor manufacturing wave, but it now faces a new opportunity created by AI, EVs, advanced telecom, defence, robotics, data centres and Industry 4.0.

The country has the foundations: engineering talent, semiconductor design capability, a large electronics market, government support and growing industrial demand. Semicon 2.0 provides a framework for building the full value chain.

But fabs alone will not make India a semiconductor power. The winning formula is:

DESIGN + FABRICATION + PACKAGING + TESTING + EQUIPMENT + MATERIALS + AUTOMATION + R&D + TALENT.

For IASC, the message is especially clear. Semiconductor manufacturing will create demand for exactly the skills at the heart of modern industrial automation: instrumentation, process control, robotics, industrial communication, Industry 4.0, predictive maintenance and cybersecurity.

India's semiconductor mission must therefore also become a national skills mission.

The opportunity is not simply to manufacture chips in India. It is to build the people, technology and industrial ecosystem that can make India a trusted global semiconductor power.

PHOTO PLACEMENTS FOR FINAL PRINT: Indian semiconductor cleanroom; wafer/advanced packaging; automated wafer handling; semiconductor technician; project/facility exterior. Use licensed high-resolution photographs.

Manoj Lal
Vice President ,
Instrumentation Automation Surveillance Communication Sector Skill Council
hpo.iascsectorskillcouncil.in





E20 को लेकर सरकार ने संसद में बता दिया सच

भारत का E20 लक्ष्य समय से पहले प्राप्त करना नवीकरणीय ऊर्जा और ग्रामीण समृद्धि की दिशा में एक महत्त्वपूर्ण कदम है।

एथेनॉल होता क्या है?

एक तरह का अल्कोहल (Ethyl Alcohol) है. इसका केमिकल फॉर्मूला C_2H_5OH है. यह एक रंगहीन और जलने वाला लिक्विड है. ये मक्का, चावल, गेंहू जैसी फसलों की प्रोसेसिंग से बनता है. चूंकि, ये ज्वलनशील होता है; इसलिए फ्यूल के तौर पर पेट्रोल में मिलाकर इस्तेमाल होता है. एथेनॉल का इस्तेमाल सिर्फ पीने की चीजों तक सीमित नहीं है. इसका इस्तेमाल फ्यूल, दवाइयों, सैनिटाइजर, परफ्यूम, केमिकल इंडस्ट्री और कई इंडस्ट्रियल प्रोडक्ट में किया जाता है. भारत सरकार जिस इथेनॉल की सबसे ज्यादा बात करती है, उसका मकसद पेट्रोल में मिलाकर फ्यूल के रूप में इस्तेमाल करना है.

क्या होता है E20 पेट्रोल?

एथेनॉल मिक्स फ्यूल की 3 कैटेगरी होती है. E-10, E-20 और E-85. जब पेट्रोल में 10% इथेनॉल मिलाया जाता है, तो इसे E-10 कहते हैं. जब पेट्रोल में 20% इथेनॉल और 80% पेट्रोल मिलाया जाता है, तो उसे E-20 फ्यूल कहा जाता है. भारत सरकार का लक्ष्य देशभर में फेजवाइज तरीके से E-20 फ्यूल को बढ़ावा देना है. जब पेट्रोल में 85% इथेनॉल मिलाया जाता है, तो इसे E-85 कहते हैं. भारत ने 20% एथेनॉल ब्लेंडिंग का लक्ष्य तय समय से करीब 5 साल पहले हासिल कर लिया है.

क्या सभी व्हीकल एथेनॉल पर चल सकते हैं?

नहीं. पुरानी गाड़ियों में बहुत ज्यादा एथेनॉल मिक्स वाले फ्यूल का इस्तेमाल करने से इंजन और फ्यूल सिस्टम पर असर पड़ सकता है.

इसी कारण ऑटोमोबाइल कंपनियां अब ऐसे इंजन डेवलप कर रही हैं, जो E-20 या उससे ज्यादा एथेनॉल मिक्स को आसानी से संभाल सकें.

E20 पेट्रोल को लेकर देश भर में घमासान मचा हुआ है. सड़क से लेकर संसद और सोशल मीडिया तक इस बात की चर्चा हो रही है कि, इस फ्यूल के चलते वाहनों का माइलेज कम हो रहा है, गाड़ियों के कंपोनेंट खराब हो रहे हैं. तमाम लोग लो इथेनॉल ब्लेंडेड फ्यूल जैसे E5 और E10 पेट्रोल के ऑप्शन की मांग कर रहे हैं. इस बीच पहली बार सरकार में बैठे किसी व्यक्ति ने E10 फ्यूल की वापसी की बात की है.

पेट्रोलियम मंत्रालय ने सोशल मीडिया प्लेफॉर्म एक्स पर इन चिंताओं को दूर करते हुए लिखा, "...पेट्रोल में इथेनॉल मिश्रण गाड़ियों को नुकसान पहुंचा रहा है या उपभोक्ताओं को अनावश्यक परेशानी दे रहा है, वास्तविक तथ्यों पर आधारित नहीं है और इसमें तकनीकी आधार की कमी है। इथेनॉल मिश्रण एक दूरदर्शी, वैज्ञानिक रूप से समर्थित और पर्यावरण के प्रति जिम्मेदार उपाय है जो राष्ट्र को बहुआयामी लाभ पहुंचाता है।"

जीवाश्म ईंधनों पर भारत की आयात निर्भरता का जिक्र करते हुए गडकरी ने कहा कि एथेनॉल पेट्रोल का एक व्यवहारिक विकल्प बनकर उभरेगा और 22 लाख करोड़ रुपये के आयात बोझ को कम करने में मदद करेगा। उन्होंने कहा, "देश का 22 लाख करोड़ रुपये का आयात है। इस आयात को कम करने का जो संकल्प हमने लिया है, धीरे-धीरे गैस का उत्पादन भी देश में होगा। पेट्रोल और डीजल का विकल्प भी तैयार हो जाएगा।"

पुरानी गाड़ियों के लिए कितना सही

पेट्रोलियम मंत्रालय के मुताबिक, "ऑटोमोटिव रिसर्च एसोसिएशन ऑफ इंडिया (ARAI), भारतीय पेट्रोलियम संस्थान (IIP) और इंडियन ऑयल कॉर्पोरेशन (R&D) ने कंफर्म किया है कि पुरानी गाड़ियों को जब E20 के जरिये चलाया गया तो वैरिएशंस, प्रदर्शन में समस्या या असामान्य टूट-फूट जाने की कोई दिक्कत नहीं देखी गई। यहां तक कि E20 फ्यूल ने इंजन में बिना किसी नुकसान के गर्म और ठंडे स्टार्टेबिलिटी टेस्ट को पास कर लिया।

KRIBHCO to set up ethanol plants: उर्वरक सहकारिता कृषक भारती कोऑपरेटिव लिमिटेड (कृभको) कच्चे माल के तौर पर मक्के और टूटे चावल का उपयोग करके तीन एथनॉल विनिर्माण संयंत्र स्थापित करने के लिए लगभग 1,100 करोड़ रुपये का निवेश कर रही है। इन तीनों संयंत्रों की क्षमता प्रतिदिन 250 किलोलीटर एथनॉल उत्पादन की होगी। ये संयंत्र गुजरात, तेलंगाना और आंध्र प्रदेश में स्थापित किए जा रहे हैं।

सरकार के मुताबिक, अगर एथेनॉल मिश्रण कार्यक्रम नहीं होता, तो बाजार के हिसाब से पेट्रोल की कीमत करीब 125 रुपये प्रति लीटर तक पहुंच सकती था, हालांकि दिल्ली में उपभोक्ताओं को पेट्रोल 94.77 रुपये प्रति लीटर की दर से मिलता रहा। सरकार का कहना है कि एथेनॉल के बढ़ते इस्तेमाल ने न केवल कच्चे तेल के आयात पर निर्भरता कम की, बल्कि आम लोगों को महंगे पेट्रोल से भी राहत दिलाई।

एथेनॉल ब्लेंडिंग से देश को क्या मिला फायदा?

सरकार के मुताबिक, एथेनॉल ब्लेंडिंग कार्यक्रम से देश को कई बड़े आर्थिक और पर्यावरणीय लाभ मिले हैं।

करीब **1.98** लाख करोड़

रुपये की विदेशी मुद्रा की बचत हुई।

लगभग **317** लाख

मीट्रिक टन कच्चे तेल के आयात की जरूरत कम हुई।

करीब **952** लाख

मीट्रिक टन कार्बन डाइऑक्साइड उत्सर्जन में कमी आई।

किसानों को **1.66** लाख करोड़

रुपये से अधिक की अतिरिक्त आय मिली।



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IASC Knowledge Bank

NSQF aligned QPs

QP Code	Job-role	NSQF Levels	Credit	Total Notional Hours
IAS/Q5602	Additive Manufacturing (3D Printing)	4	13	390
IAS/Q3006	Building Automation Specialist	5	19	570
IAS/Q5603	Cabling Technician	4	14	420
IAS/Q5605	DCS Programmer and Troubleshooter	4	14	420
IAS/Q8005	Industrial Automation Specialist	5	19	570
IAS/Q5601	Industrial Automation Technician	4	13	390
IAS/Q3001	Instrumentation Technician (Control Valve)	4	14	420
IAS/Q3102	Instrumentation Technician (Process Control)	4	13	390
IAS/Q3003	Junior Instrumentation Technician (Process Control)	3	11	330
IAS/Q5604	Programmable Logic Controller (PLC) Programmer and Troubleshooter	4	15	450
IAS/Q8007	Junior Executive - Technical Sales (Automation)	4	14	420
IAS/Q8006	Junior Executive - B2B Customer Relation (Automation)	4	14	420

Standalone NOS

QP Code	Job-role	NSQF Levels	Credit	Total Notional Hours
IAS/N5007	Fundamental of Industrial Communication Protocols	5.5	1.5	45
IAS/N3009	Introduction to Industrial Robotics	4	2	60

Micro-Credentials

QP Code	Job-role	NSQF Levels	Credit	Total Notional Hours
IAS/MCr-0002	Fundamental of Digital Manufacturing	5.5	1	30
IAS/MCr-0003	Fundamental of Industrial Drive and Control	5.5	1	30
IAS/MCr-0004	Fundamental of PLC Programing	5.5	1	30
IAS/MCr-0001	Introduction to Industrial Hydraulic	4	1	30
IAS/MCr-0005	Introduction to Industrial Pneumatics	3	1	30
IAS/MCr-0006	Introduction to Metal Additive Manufacturing	4	1	30

Upcoming QPs

QUALIFICATION NAME	DOMAIN
Pneumatic, hydraulic & motion control specialist	Factory automation
Manager- system integration	Factory automation
DCS specialist	Process automation
Process automation engineer	Process automation
SPM (special purpose machine) specialist	Mechatronics
Applied mechatronics specialist. Sensor technology & application expert	Mechatronics
Bio medical instrumentation specialist	Medical instrumentation
Green Automation Expert	Green Automation
Smart Farming (Farm Automation) expert	Farm Automation
Physical Securities and surveillance Specialist	Surveillance
Drone Design & Manufacturing Engineer	Drone Technologies
Communication & Broadcasting Technologist	Communication & Broadcasting

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Participation Opportunities

- WorldSkills engagement (Intelligent security / Mobile Robotics / Mechatronics / Industrial Control / Optoelectronic Technology)
- Exhibition Stalls
- Sponsorship*
- Paper Presentations
- Panel Discussions
- Industry–Academia Networking

Event Highlights

- Launch of Qualification on Data Protection Officer
- Launch of Higher-level Skill Qualifications in Partnership with **MHI**
- Launch of Automation Skill Challenge problem statement in partnership with Janatics Global Solutions Pvt Ltd.
- Exchange of MoUs
- IASC Vision for Worldskills 2028

Important Dates

1. Communication of acceptance – **05 Sep 2026**
2. Paper submission – up to **10 Sep 2026**
3. Registration

All papers should be in PDF/JPG format and are to be accompanied by:

a) A brief profile of the author along with photographs.

b) A consent note allowing IASC-Sector Skill Council to publish the paper in the Journal/Souvenir of the said workshop.

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