



AI Driven Manufacturing: Innovation, Efficiency & Sustainable Growth



Foreword

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Every few decades, a force emerges that doesn't just optimize how we work, but redefines the very fabric of industry. Today, that force is Artificial Intelligence. It is not a trend but a transformation. It challenges conventions, rewards innovation, and compels us to rethink the fundamentals of manufacturing itself.

We stand at the brink of an industrial reset. While traditional models relied on scale and labour, the new paradigm demands intelligence, agility, and sustainability. AI-enabled manufacturing is not a distant vision - it is already reshaping global value chains through predictive systems, autonomous operations, and circular resource models. The question is no longer if we adopt AI, but how fast and how meaningfully we do so.

This report is both a reflection and a call to action. It offers a clear-eyed assessment of where we are today, and a forward-looking blueprint for where we must go. It explores not only the technologies that will drive the next wave of manufacturing growth but also the ecosystems of policy, skill, infrastructure, and collaboration.

As India embraces the fourth industrial revolution, ASSOCHAM remains committed to its role as a catalytic enabler of growth. Through our deep engagement with industry and government, we have continuously supported innovation, investment, and policy reform. Our knowledge partnerships aim to ensure that insights are not only shared but implemented, and that India's manufacturing vision is both globally competitive and locally inclusive.

Odisha, with its industrial legacy, policy momentum, and emerging AI ecosystem, is uniquely placed to lead this transformation. From smart ports to green manufacturing corridors, from academic excellence to startup innovation, the state offers the right conditions for AI-powered progress.

I trust this report will inform, inspire, and ignite collaboration between stakeholders across the spectrum towards building a future that is intelligent, sustainable, and proudly Made in India.

Foreword

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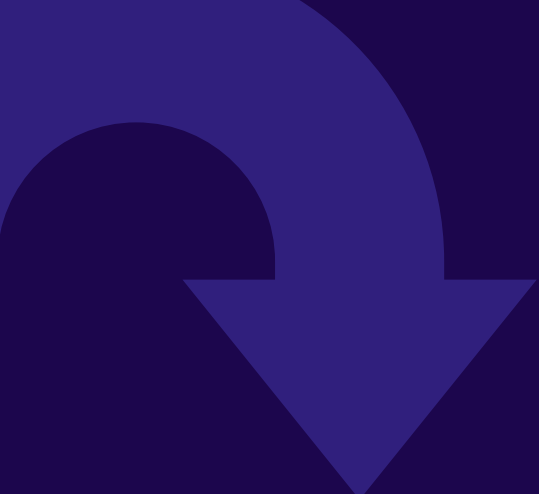


Artificial Intelligence is not just a technology of the future, it is a transformative force of today. In the evolving landscape of manufacturing, AI is redefining how we produce, consume, and innovate. Globally, over 80% of manufacturers are now integrating AI across operations, reporting gains in productivity, quality, and resilience. As reported by the World Economic Forum, AI-powered factories have achieved 12.5% reductions in material costs, 66% fewer defects, and upto 20% faster cycle times, setting a new benchmark for operational excellence.

Particularly Odisha stands at a pivotal moment in this journey. With a strong industrial base, a growing digital ecosystem, and a forward-looking policy environment, the State has demonstrated a clear intent to lead from the front. The launch of the Odisha AI Policy 2025 and the establishment of the Odisha AI Mission mark decisive steps towards embedding AI across core sectors, from steel and mining to green energy and smart logistics.

This report captures the immense potential of AI in driving Odisha's manufacturing ecosystem forward while aligning it with global benchmarks such as responsible innovation, intelligent automation, and Industry 4.0 readiness. As seen in global studies, AI-integrated factories can reduce waste by 20% and emissions by up to 15% - benefits that India's industries are well-positioned to realize with the right investments and governance frameworks.

We at Primus Partners hope that this report serves as a useful guide for policymakers, industry leaders, investors, and innovators alike, as we collectively build a future-ready, inclusive, and AI-empowered Odisha.



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Executive Summary

The fourth industrial revolution is being shaped by rapid advances in Artificial Intelligence (AI), and manufacturing is at its core. Across the globe, factories are evolving into smart, connected ecosystems—where data fuels precision, automation drives efficiency, and sustainability is engineered into every process. AI is no longer a distant frontier; it is today's competitive differentiator.

India is beginning to witness this shift. AI-led innovations in predictive maintenance, quality assurance, energy management, and supply chain optimization are emerging across automotive, textile, energy, and electronics sectors. Supported by national missions on AI and digital transformation, the country is poised to build globally competitive, tech-enabled manufacturing value chains.

This report examines the transformative potential of AI in manufacturing—mapping its applications, highlighting real-world use cases, and identifying

enablers that can accelerate adoption. Drawing from global best practices and national policy frameworks, it outlines how AI can strengthen India's industrial resilience while aligning with environmental, social, and governance (ESG) goals.

Key Takeaways

- **AI in Manufacturing is Inevitable:** Global and Indian manufacturers are integrating AI across production, quality control, supply chains, and sustainability operations
- **AI Drives ESG Goals:** Integrating AI into energy use, emissions tracking, & resource optimization contributes directly to ESG compliance and long-term sustainability
- **Policy & Collaboration are Key:** Multi-stakeholder alignment - across government, academia, industry and startups - will be essential to drive scalable AI adoption.

Opportunities for Odisha

The recently launched Odisha AI Policy 2025, supported by the Odisha AI Mission, demonstrates the state's commitment to embedding AI across sectors and also presents various upcoming opportunities:

- Create an **AI Manufacturing Mission** anchored in Odisha's industrial policy to drive AI integration
- Develop **AI Centers of Excellence** in collaboration with IIT Bhubaneswar, IIIT and NIT Rourkela
- Launch **AI pilot programs in MSME clusters** to demonstrate ROI and scalability
- Partner with global tech firms and local startups for AI solutioning, talent development and knowledge transfer

Recommendations

- **Policy Enablement:** Introduce AI sandboxes, innovation grants and AI-readiness assessments to accelerate industrial AI Adoption
- **Digital Infrastructure:** Strengthen cloud, data and connectivity infrastructure to enable seamless AI operations
- **Skill Development:** Embed AI/ML training in engineering and vocational programs to future-proof the workforce
- **Monitoring & Evaluation:** Define clear KPIs for AI adoption, impact and sustainability gains



02

AI in Manufacturing: Current Landscape & Global Benchmarks

2.1 Background

Artificial Intelligence (AI) is quickly emerging as a key component of India's manufacturing excellence journey driving innovation, productivity and operational transformation. Adoption of AI in Indian manufacturing is no longer a new trend rather it is moving from pilot-stage experimentation to core business strategy in line with the nation's larger Industry 4.0 goals.

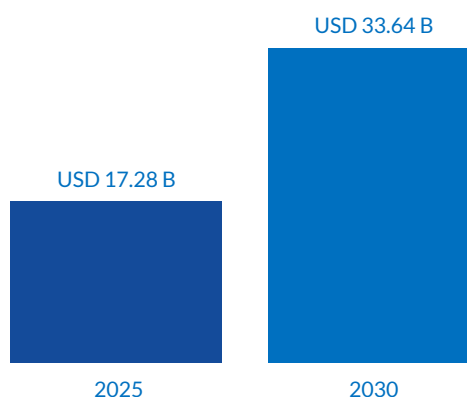
According to NASSCOM, on a global scale digital technologies are projected to account for around 40% of total manufacturing expenditure by 2025, doubling from just 20% in 2021. This dramatic shift signals a broad-based embrace of factory automation, spanning the entire manufacturing lifecycle—from raw material processing to finished goods.

While India's Industrial Automation Market size is currently estimated at USD 17.28 billion in 2025, and is expected to reach USD 33.64 billion by 2030, at a CAGR of 14.26% during the forecast period (2025-2030).

India Industrial Automation Market

Market Size in USD Billion

CAGR 14.26%



2.2 Sector Transformation: Automotive to Textile Industry

AI's effects are evident in many industries:



Automotive: 54% of Indian automotive companies have already adopted AI for smart assembly lines, predictive maintenance, and quality control, driving both efficiency and product quality.



Electronics: Machine vision systems powered by AI enabling high-precision defect detection. The electronics industry is projected to reach \$300 billion in value by 2026.



Pharma and Chemicals: AI is revolutionizing drug discovery and compliance monitoring, automating batch analysis for faster, safer production.



Textiles: Contributing 2.3% to India's GDP, the textile industry is integrating AI for customized design, efficient cutting, and defect detection, boosting both productivity and export potential.

Adoption of AI is boosting manufacturing productivity which is leading to significant cost savings decreased downtime, increased output, and improved product consistency. Additionally, the incorporation of AI technologies is strengthening India's competitiveness internationally and encouraging sustainable manufacturing methods. Good government policies and more funding for AI infrastructure and talent development are facilitating this quick change.

2.3 Global Trends and AI Adoption in Manufacturing in India

The manufacturing sector worldwide, including India, is being transformed by the rapid adoption of AI. The years 2024 and 2025 mark a turning point as AI moves from promise to practice, reshaping how factories operate and compete.

2.3.1 Global AI Adoption in Manufacturing

In 2024, approximately 35% of global manufacturers were already using AI, particularly for predictive maintenance, quality control, and supply chain management. The global AI in manufacturing market was valued at \$5.94 billion in 2024 and is projected to reach \$230.95 billion by 2034, with a CAGR of 44.2%.

By 2025, global AI adoption across all sectors is expected to increase by 20%, surpassing 378 million users, with manufacturing as a key driver. AI-driven automation is projected to boost manufacturing productivity by up to 40% by 2035, with AI detecting defects at 90% accuracy and improving quality control by 35%.

2.3.2 AI Trends in Indian Manufacturing

With 30% of Indian manufacturers already at the forefront of AI adoption—second only to the USA—India is rapidly emerging as a global hub for AI-driven manufacturing.

Nearly half of AI-related investments in India are focused on hardware, robotics, analytics, and support systems, demonstrating a strong commitment to advancing manufacturing through technology.

2.4 Government's role in shaping the Nation's Industrial Future

The transformation of India is not occurring in a vacuum. It is driven by substantial investment and policy support:

- **Make in India:** Because of liberalized FDI and PLI schemes India's merchandise exports have increased dramatically since their inception in 2014 reaching \$437.06 billion in 2023–2024.
- **Digital India:** Through smart city projects and nationwide digital platforms the gap between urban and rural areas is being closed allowing millions of people to access digital services.
- **Odisha AI Policy 2025:** Structured around four pillars of AI infrastructure, skilling, energy-efficiency, and ethical governance, the Odisha AI policy aims to drive inclusive growth, better governance, and digital transformation through responsible and scalable AI adoption.



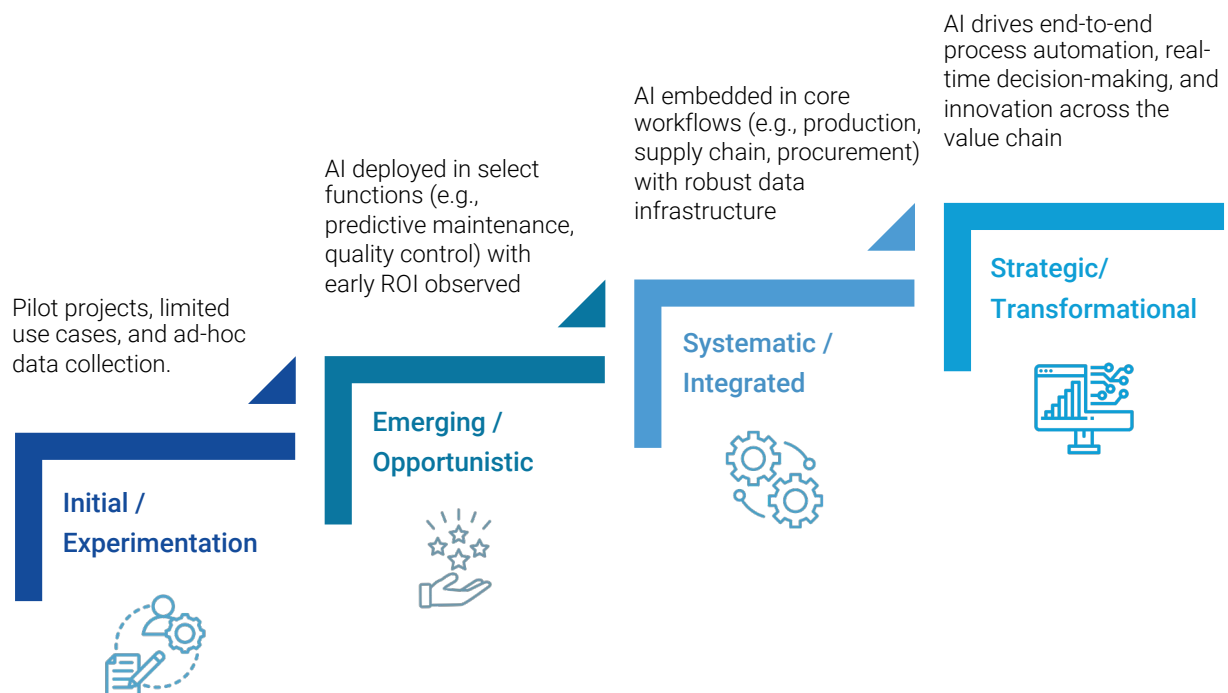
2.4.1 A comparative overview of the key government initiatives highlights the launch of various schemes that support national development across multiple sectors:

Initiative	Launch Year	Focus Areas	Key Achievements (2024-2025)	Challenges
Make in India	2014	Manufacturing, FDI, Jobs	\$437B exports, FDI growth, PLI scheme, sectoral job growth	GDP share target unmet, sector gaps
Digital India	2015	Digital infra, e-governance	Nationwide digital access, e-services, financial inclusion	Digital divide, rural connectivity
IndiaAI Mission	2024	AI R&D, talent, compute	33.4% AI hiring growth, 18,693 GPU infra, AI startups	Modest public investment, ethics

2.5 AI Maturity: The Road Ahead

Even though AI is being adopted quickly—77% of manufacturers are using it and 34% are seeing a return on investment—only 1% of manufacturers have fully matured AI. The majority of those which use AI for supply chain optimization, demand forecasting and product development are in the **Emerging or Systematic stages**.

- A phased targeted approach is necessary because poor data quality and unclear integration can cause up to 60% of AI projects to fail.
- By 2028 it is anticipated that the manufacturing AI market will have grown to \$20.8 billion, making AI maturity a crucial differentiator for sustained competitiveness.



Levels of AI Maturity

2.6 Global Lessons: Inspiration from the World's Best Practices

The global race for AI leadership is intensifying, with the U.S. leading in investment and business integration, China excelling in research and model quality, while Europe and Singapore are focusing on digital competitiveness and regulation.

2.6.1 United States: Investment Scale and Business Integration

The U.S. led global AI investment in 2024 with \$109.1 billion, far outpacing China, and the U.K. Generative AI attracted \$33.9 billion, up 18.7% since 2021. U.S. companies lead in adoption (78% use AI, 71% use generative AI), positioning the country as the benchmark for AI-driven competitiveness.

2.6.2 China: Research Leadership and Model Quality

China closed the gap with U.S. AI models in 2024, leading in research output and patents. With 83% of firms optimistic about AI and a focus on responsible AI, China is rapidly advancing through robust R&D and global governance participation.

2.6.3 Europe and Singapore: Digital Competitiveness and Strategic Innovation

Europe emphasizes regulatory rigor and targeted investment, with Switzerland and Denmark among the top digital economies. In Singapore and Germany, industry leaders like Siemens and Philips use AI, digital twins, and IoT for manufacturing and healthcare.



2.6.4 Industry Case Studies: Innovation in Action



Siemens (Germany): Leveraged digital twins and IoT to cut time-to-market and boost manufacturing efficiency.



GE (U.S.): Applied AI for predictive healthcare and improved diagnostics.



Fanuc (Japan): Used AI for precision in robotic manufacturing tasks.



Mayo Clinic (U.S.): Integrated AI and telemedicine to enhance care accessibility and quality

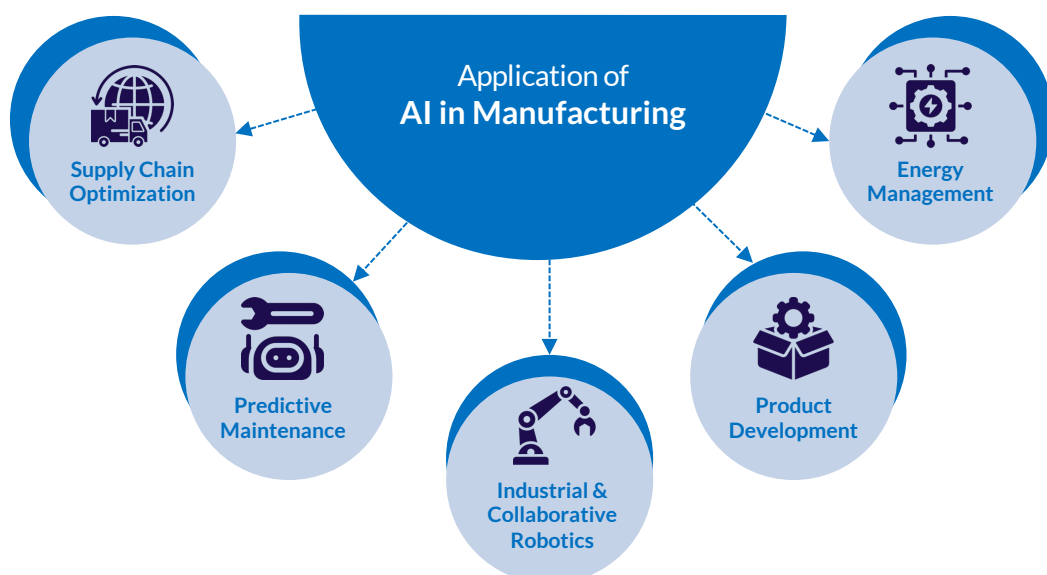
03

Smarter, Faster, Greener: The AI-Powered Future of Manufacturing

Manufacturing is changing dramatically. Previously characterized by human supervision and fixed assembly lines, traditional factories are changing into intelligent systems that can think, learn, and optimize themselves in real time. The core of this change is artificial intelligence (AI) which is changing the way we manufacture, track and transport goods around the world. This is the era of Smart Factories.

In order to increase quality, reduce costs, and compete in a supply chain environment, firms are scaling intelligent technologies. This change has the potential to break through long-standing bottlenecks and establish globally competitive industries in India particularly in states like Odisha.

Depicted below are the some of the many use cases of AI in the manufacturing sector:



Source: Benefits of AI in Manufacturing Industry

3.1 The Building Blocks: Core AI Technologies Redefining Manufacturing

To redefine manufacturing, we need smart factories that are powered by a collection of clever technologies. These AI applications are linked levers that drive accuracy, speed, and sustainability rather than being standalone tools. Some of such latest applications are discussed below:



Predictive Maintenance Reducing Downtime and Costs



AI-Enabled Quality Control & Defect Detection



Factory Automation & Smart Robotics



Digital Twins for R&D and Simulation



AI-Driven Supply Chain & Logistics Optimization

3.1.2 AI-Enabled Quality Control & Defect Detection

Real-time detection of minute defects or misalignments by AI enabled checks guarantee product quality and low waste.

- With an accuracy of up to 99 percent, systems are able to identify flaws like scratches, incorrect sizing, and misaligned parts.
- Maintains international standards and enhances customer trust while lowering rework and returns.
- Particularly useful in industries with high precision and speed such as electronics.

3.1.1 Predictive Maintenance

AI uses machine logs and real-time sensor data analysis to identify irregularities and anticipate failures before they happen. This extends the life of the machine, lowers maintenance expenses significantly, and minimizes unscheduled downtime.

- Lowers maintenance expenses by 10–40% and unscheduled downtime by up to 50%.
- Makes it possible to perform just-in-time repairs rather than expensive preventive maintenance or unplanned malfunctions.
- Applicable in energy, automotive, heavy machinery, and even solar infrastructure

3.1.3 Factory Automation & Smart Robotics

AI-powered robots can react to unforeseen circumstances in addition to obeying commands. To lessen stress and boost productivity collaborative robots or cobots are being trained to operate safely alongside human operators.

- ABBs YuMi robot can perform intricate and delicate assembly tasks.
- Automates repetitive or high-risk tasks to increase productivity, accuracy, and worker safety.
- Production lines are optimized to allow for mass customization without downtime.

3.1.4 Digital Twins for Simulation and R&D

A digital twin is a virtual replica of a physical product or process, continuously updated with real-time data. AI enables predictive simulations to test improvements before deployment.

- Assists engineers in forecasting errors, simulating system performance, and optimizing designs without stopping production.
- Lowers prototyping expenses and speeds up product development cycles.
- Essential for infrastructure performance tracking and smart city planning.

3.1.5 AI in Supply Chain Optimization

AI algorithms crunch massive volumes of structured and unstructured data to optimize procurement, demand forecasting, warehousing, and delivery planning.

- A 20–30% improvement in forecasting accuracy lowers stockouts and excess inventory.
- Through real-time logistics, rerouting, and supply chain risk identification resilience is increased.
- Virtual assistants and AI chatbots cut down on manual paperwork and response times in the procurement process.

Before AI Integration



Static Models

Digital Twins operated as static representations, relying on predefined parameters and manual updates



Limited Predictive Capability

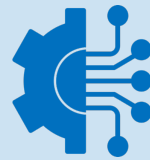
Without AI, these models could not effectively predict future states or adapt to new data inputs



Manual Analysis

Engineers and analysts had to manually interpret data, which was time-consuming and prone to human error

After AI Integration



Dynamic Learning Models

AI enables digital twins to learn from real-time data, allowing continuous updates and adaptations



Enhanced Predictive Analytics

With machine learning algorithms, digital twins can forecast future conditions and potential failures, improving decision-making



Automated Insights

AI processes vast amounts of data quickly, providing actionable insights without the need for manual intervention

3.2 The Real -World Impact: How AI Powers Global to Local Success Stories

AI-driven smart manufacturing is already producing measurable outcomes in national and international contexts. These success stories range from AI-enabled quality control in textiles to predictive maintenance in defense systems:

-  Bharat Electronics Limited (BEL) employed predictive maintenance for the Indian Navy to identify issues with their fire control systems and make quicker repairs.
-  AI-driven predictive maintenance for solar inverters in Odisha increased energy output while reducing maintenance expenses by 20% and system downtime by 25%.
-  Bhubaneswar Smart City uses digital twin technology to simulate and track traffic patterns, water consumption, and emergency response as part of their Smart Cities Mission. To build a predictive urban management ecosystem that improves infrastructure efficiency AI incorporates real-time sensor data.
-  At its Manesar plant, Maruti Suzuki in India integrated over 5000 industrial robots. AI-powered smart robotic systems carry out intricate painting and assembly jobs making this facility a pioneer in AI-driven factory automation
-  General Motors applied generative AI design to reinvent a seat bracket, consolidating eight components into one 3D-printed part. This redesign led to a 20% lighter and 40% stronger component, exemplifying AI's role in intelligent product engineering.

It is evident that AI adoption in smart manufacturing is already transforming industries, delivering measurable improvements in operational efficiency, cost reduction, and product quality across sectors such as energy, industrial infrastructure, automotive, textiles, and defense.

Example in Use: Bhubaneswar Smart City



Physical Entities

Urban infrastructure, traffic, utilities



Digital Twin

Virtual model of the city with real-time data integration from sensors and cameras



Outcome

Improved traffic management, energy optimization, and waste management

3.3 Scaling Intelligence: Global Momentum, National Vision, Odisha's Opportunity

AI-driven manufacturing isn't just a technology trend—it's an economic strategy. Nations and companies that scale early adoption gain a sustainable edge in cost, innovation, and market access.

- Pioneers like Toyota and BMW are using intelligent automation and predictive maintenance to save millions of dollars and thousands of hours every year.
- Through the SAMARTH Udyog Bharat 4.0 program India is promoting smart factories and domestic innovation is being showcased by businesses such as Maruti, BEL and GreyOrange.
- Odisha is incorporating AI into solar infrastructure smart city systems and urban systems. Extending this momentum to create AI-enabled manufacturing zones with an emphasis on MSMEs and industrial clusters is the next stage.

3.4 Why We Must Act Now: The Case for AI in Policy and Industry

AI is no longer a luxury—it is an operational and economic imperative. The global supply chain crisis, rising customer expectations, and competitive price pressures demand intelligent, adaptive factories.

Strategic Gains:

- **Precision at scale:** AI ensures zero-defect quality while meeting the demand for customization.
- **Business continuity:** Predictive alerts and real-time adjustments protect operations from sudden failures.
- **Agile Market Entry:** AI accelerates product development and launch timelines via simulation and automation.
- **Energy & waste efficiency:** AI reduces idle time, excess inventory, and power consumption.
- **Compliance & sustainability:** Automates documentation, improves traceability, and reduces regulatory risks.



3.5 Conclusion: Building Smart Factories for a Smarter Economy

Nowadays artificial intelligence is a reality that helps the manufacturing industry become more accurate efficient and resilient. These technologies which range from smart robotics and AI-optimized supply chains to automated quality checks and predictive maintenance are setting the stage for a new era of industrial excellence. The benefits are evident: lower expenses, fewer mistakes, quicker production cycles, and heightened competitiveness internationally. But awareness alone is not enough to realize this vision at scale. It necessitates proactive, coordinated, and strategic action.

What Needs to Be Done?

To unlock the full potential of AI in manufacturing, a coordinated effort is required across policy, industry, academia, and the workforce.



Policy & Incentives:

Governments must go beyond AI-friendly policies to ensure execution—through PLI schemes, MSME-specific pilots, and production incentives linked to digital adoption.



MSME Enablement:

Offer subsidized AI trials, cloud-based tools, and establish AI facilitation cells in District Industries Centres to help smaller manufacturers begin their adoption journey.



Skilling & Talent:

Upgrade ITIs and polytechnics with AI-integrated curricula, focusing not only on technical roles but also on operations, safety, and quality management.



Innovation Infrastructure:

Develop public-private AI labs in industrial clusters for experimentation, capacity building, and proof-of-concept development.



Data & Digital Infrastructure:

Invest in secure, interoperable data platforms to support real-time AI use cases, with strong governance frameworks.



Financing & Procurement:

Introduce easy leasing and financing models for AI technologies and use government procurement to create demand for AI-driven solutions.



Odisha's Role:

With strengths in electronics, textiles, and solar, Odisha can position itself as a leader in intelligent manufacturing by embedding AI into industrial corridors and MSME zones.

04

Expanding Odisha's Manufacturing Ecosystem with AI

Odisha is at the forefront of an industrial revolution using artificial intelligence (AI) to spur innovation and long-term expansion throughout its manufacturing sector. Odisha's traditional strengths can be enhanced by AI applications in strategic industries positioning the state as a competitive center for AI-integrated manufacturing.

AI can strengthen the State's industrial base in Odisha by reducing energy consumption, increasing output and preventing accidents in the mining and heavy industries.

4.1 Leveraging AI in Odisha's Core Sectors

A. Mining and Heavy Industries:

Nearly 47% of the nation's total mineral production and more than 55% of its iron ore production comes from Odisha. AI has enormous potential to improve metals and mining safety productivity and sustainability.



For example,

Vedanta Ltd. has deployed AI-powered drones at its Jamkhani coal mine in Odisha (operational as of early 2025) to monitor blasting zones in real time, autonomously detecting unauthorized movements within a 500m blast radius improving safety compliance and incident response.

Similarly, Steel Authority of India (SAIL) is piloting AI-based predictive maintenance at Bokaro Steel Plant, using smart sensors to predict equipment faults and schedule maintenance (before breakdowns occur), reducing downtime and costs.

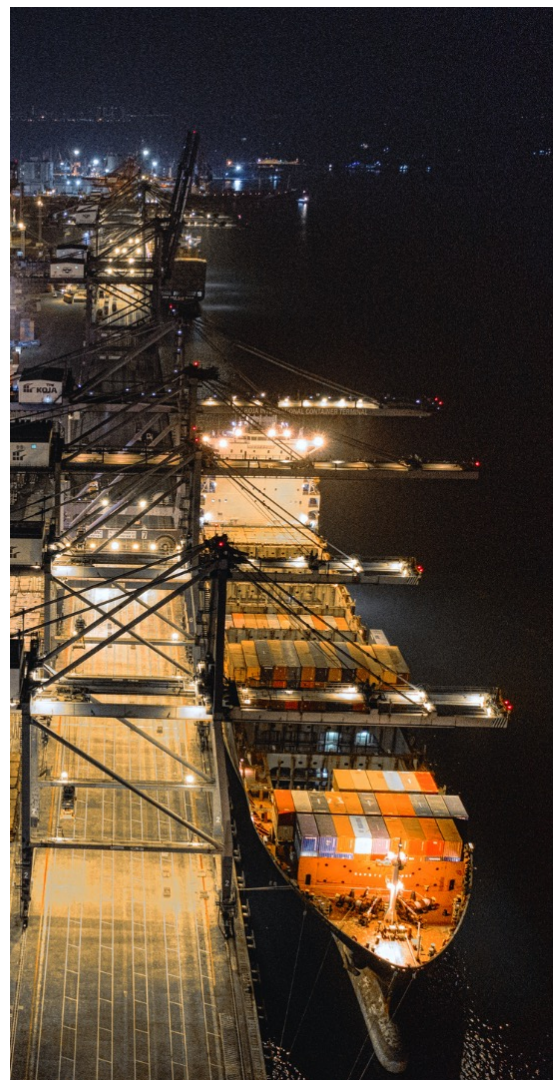
Tata Steel's Kalinganagar plant is an example of predictive analytics and digital twins to optimize operations such as energy use, quality and yield. It has achieved 8–12% higher throughput and an annual margin improvement of \$10 million. The plant upskilled its workforce through an in-house analytics academy, illustrating how human capital and AI together drove performance gains.

B. Ports and Logistics:

Smart Port technologies are being implemented at the Paradip and Dhamra ports in Odisha in order to handle increasing cargo volumes. By implementing AI for just-in-time vessel berthing and real-time ship monitoring through an AI-enabled Vessel Traffic Management System, Paradip is undergoing extensive technological modernization to become a Port 4.0 facility.

Adani-run Dhamra Port is growing with automation to accommodate a variety of cargos and a planned port-based industrial zone. Globally, AI-driven projects are becoming the norm. All ten of the biggest container ports use automation to reduce costs and speed up turnaround.

By utilizing AI in port operations (for route optimization, crane predictive maintenance, cargo tracking etc.), Odisha is set to improve its logistics performance and attract investment.



C. Smart Cities and Infrastructure:

Bhubaneswar's Smart City Initiative and Law Enforcement

- Launched in mid-2023, Bhubaneswar operates an Integrated Command and Control Centre, using AI for surveillance, traffic control, and emergency response by facial recognition, crowd analysis, and incident detection.
- The unified command centre in Bhubaneswar and Cuttack pulls video from public and private CCTV feeds, allowing police to monitor and respond 20–30%.

AI in Municipal Services:

- Bhubaneswar's SAFA app tracks waste collection and sanitation in real-time, optimizing utilities and maintenance.
- These steps align with global best practices, such as Singapore's AI-powered traffic lights reducing commute times by up to 15% and energy-efficient building systems.

AI in Urban Planning:

- AI uses satellite imagery and machine learning to monitor unauthorized construction.
- As Odisha urbanizes, AI applications will help ensure infrastructure keeps pace with growth in a sustainable, citizen-friendly way.

D. Renewable Energy and Decarbonization:



AI in Energy Efficiency:

- AI helps manage renewable intermittency and improve energy efficiency, potentially reducing energy consumption and emissions by 10–20% in the long run.
- In Odisha's power sector, AI-based forecasting predicts solar output and optimizes grid dispatch for reliable power supply.



Green Initiatives:

- Indian Oil Corporation and other investors are investing ₹508 billion in green hydrogen and ammonia plants at Paradip, set to be operational by 2026.



Industrial AI Applications:

- Tata Steel's Kalinganagar plant uses AI to optimize temperature control, improving throughput, saving energy, and ensuring consistency.
- Hindalco and Vedanta's aluminium smelters are exploring AI to reduce power wastage through predictive control of potlines.



Decoupling Growth from Emissions:

- By integrating AI solutions, Odisha's industries can reduce emissions while driving growth, aligning with ESG goals.

4.2 AI-Focused Industrial Zones in Odisha

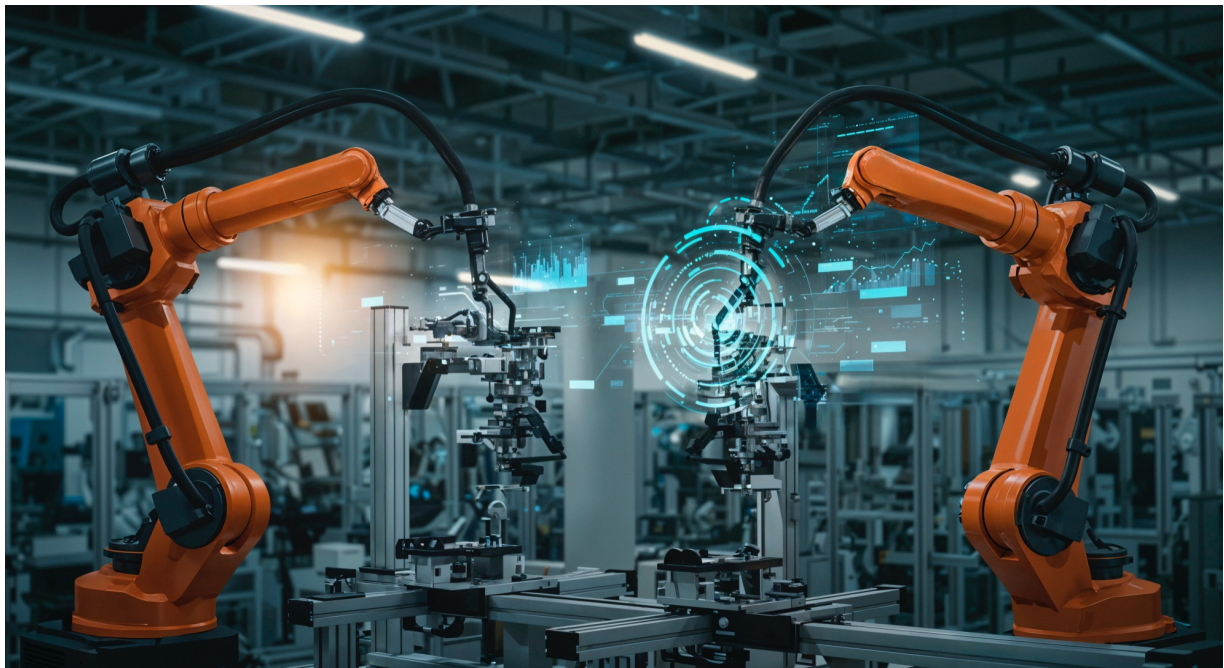
Digital Manufacturing Parks (Kalinganagar, Jharsuguda): Establishing dedicated enclaves for Industry 4.0 solutions – robotics, industrial IoT, and AI-driven factory software, featuring shared test-bed facilities where SMEs pilot automation tools. A potential “Smart Steel Factory Lab” in Kalinganagar could co-develop AI models for energy management and defect detection, modeled after Singapore’s ARTC.

AI & Data Innovation Hub (Bhubaneswar): A Knowledge City or “AI Park” to support startups, R&D centres, and training institutes focused on AI applications in manufacturing. O-Hub supports startups, and an AI Park could expand this with GPU clusters, co-working labs, and a Centre of Excellence. Singapore’s AIMfg CoE offers a model for Odisha to follow

Port-based AI Logistics Zones (Paradip, Dhamra):

Similar to Rotterdam and Busan ports, Odisha can set up these zones to export AI logistics solutions. Developing a tech cluster for supply chain startups, port automation vendors, and smart warehouse demonstrations is in line with Paradip’s automation plans and just-in-time berthing objectives.

To draw in investments and position Odisha as an exporter of AI-led manufacturing technologies each zone should offer incentives that are specifically designed for that purpose. This approach is validated by international examples such as the Manufacturing USA network and Germany’s smart industry hubs.



4.3 Building Academic Alliances and a Thriving Startup Ecosystem

Odisha's academic institutions and startup initiatives are creating a strong pipeline of AI talent and innovation:

- **Industry-Academia Collaborations:** Notable MoUs include SAIL's Rourkela Steel Plant partnering with NIT Rourkela (Feb 2023) to co-develop AI solutions. IIT Bhubaneswar and IMMT are advancing AI in energy and mineral processing. Odisha can scale this with grants, AI research chairs, and regional CoEs.
- **Incubators and CoEs:** Software Technology Parks of India (STPI) runs two Centres of Entrepreneurship in Bhubaneswar for AI, IoT, and fintech startups. O-Hub incubator (26 startups in 2023) is expanding through Startup Xpress and Fab Lab Odisha, supporting deep-tech and manufacturing startups with prototyping, mentorship, and government links

Key Players:

- IIT/IIIT Bhubaneswar: Specialize in AI/ML, robotics, and intelligent systems.
- NIT Rourkela: Focus on industrial AI and green manufacturing
- STPI CoEs: Provide incubation and access to national startup programs.
- Tata Steel AI CoE: Drives industrial AI innovation and supports tech SMEs.

Odisha's economy is rapidly changing from one that relies heavily on resources to one that is supported by knowledge. Odisha can create the groundwork for large-scale AI self-reliance by fostering startups that address state-specific issues and coordinating business and academic research and development.

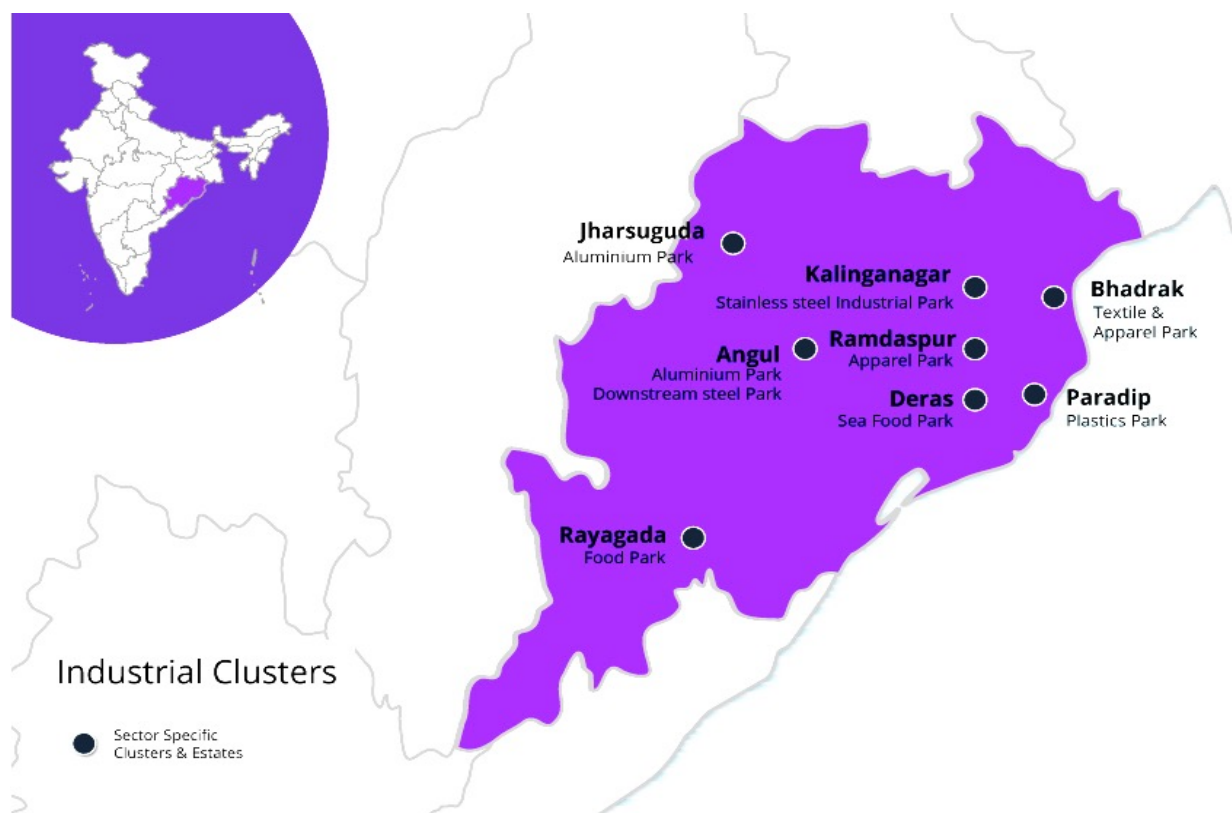


4.4 Charting the Future: Leveraging Odisha's Regional Strengths for AI-Enabled Growth

Odisha's evolving industrial fabric—powered by abundant resources, port connectivity, and a proactive policy regime—is uniquely positioned to harness AI for next-gen manufacturing.

Strategic Industrial Landscape:

- Odisha accounts for **41.2 MTPA** of India's steel production across 54 steel plants, placing it at the heart of India's metal economy.
- The **Odisha Economic Corridor (OEC)**, part of India's East Coast Economic Corridor, spans **600 km** and includes **11 clusters** across two industrial zones—blending inland mineral wealth with global port access.
- Power surplus of **~8,000 MW**, increasingly from renewables, supports energy-intensive AI deployments like smart robotics, digital twins, and real-time analytics.



IPR 2022 – A Digital-First Vision:

The **Industrial Policy Resolution (IPR) 2022** identifies AI, Industry 4.0, and digital infrastructure as focus areas. It promotes:

- AI adoption in **smart manufacturing zones**
- Incentives for **AI-integrated units** in high-priority sectors (e.g., metals, food processing)
- Support for **CoEs**, R&D incentives, and plug-and-play facilities for deep-tech firms

Major infrastructure upgrades like the Eastern DFC, Coastal Highway, and smart port logistics (Paradip, Dhamra) are reducing transit times and costs, crucial for AI-integrated supply chains.

Odisha's geography enables a hybrid model—AI-enhanced manufacturing in mineral belts, and AI-powered logistics from ports. The groundwork is laid for Smart Manufacturing Corridors integrating physical and digital infrastructure.

IPR 2022 – A Digital-First Vision:

Region	Focus Areas	Advantage
Angul	Metal downstream industries	Near JSPL ecosystem
Jharsuguda	Aluminium downstream near Vedanta	Access to smelter
Rayagada	Paper, fiber, polymers	Expanding into specialty materials



05

Responsible Manufacturing with AI: Sustainability and ESG

5.1 Leveraging AI to Improve ESG Performance

Why it matters:

With ESG becoming central to industrial credibility, AI offers the most scalable toolset for making sustainability real, measurable, and monetizable.

Environmental Impact:

- AI helps reduce CO₂ emissions from manufacturing (~60% of global emissions) through process optimization, route planning, and intelligent energy use.
- Example: AI-driven route optimization reduced fuel consumption by over 7% in a fleet of 70 cargo vessels.



Waste Reduction:

- Manufacturing contributes to over 40% of global material waste.
- Companies like Tata Steel use AI for real-time process optimization and defect detection, reducing waste and improving efficiency.
- AI-based scheduling and control systems cut raw material usage and minimize product rework, leading to significant savings.

ESG Governance:

- AI-powered ESG platforms like IBM, Envizi and Microsoft Sustainability Manager track emissions, energy use, and compliance metrics in real-time.
- These platforms align with global standards like GRI and SASB, transforming ESG from annual reports to daily operational practices.



5.2 AI-Driven Responsible Manufacturing: Global Cases

TATA STEEL

Tata Steel has deployed 550+ AI models across its production units, improving furnace efficiency, reducing energy use, and lowering emissions. In Europe, AI-controlled zinc coating minimizes material waste, while AI tools monitor dust and pollution in real-time at Indian facilities.



The company's smart energy platforms have helped customers avoid over 600 million metric tons of CO₂ emissions. AI solutions monitor power use, integrate renewables, and predict equipment inefficiencies.



Unilever Tinsukia plant in India implemented over 50 AI initiatives (including AI enabled "Lighthouse Factories"), improving changeover speed by 85%, reducing defects by 21%, and AI-driven digital twins helped reduce virgin plastic usage by 21%.

SIEMENS

At its Fürth plant, AI reduced energy per unit by 64% and boosted output by 145%. A near-circular waste reuse model, enabled by AI, halved waste per unit.

These global case studies signal a shift towards ESG-led digital transformation, with measurable ROI and replicable models for Odisha industries.



5.3 Odisha's Journey So far: Powered by AI

Real-Time Monitoring in Angul:

- AI-powered CEMS (Continuous Emissions Monitoring Systems) installed across key industrial units.
- The Star Rating Program assigns ESG ratings to factories based on real-time data, improving transparency and compliance.

ESG Dashboards in Paradip:

- AI-enabled dashboards in Paradip track emissions, energy use, and safety across manufacturing hubs.
- Paradeep Phosphates uses AI forecasting to align expansions with ESG norms, setting a digital governance model for environmental planning.

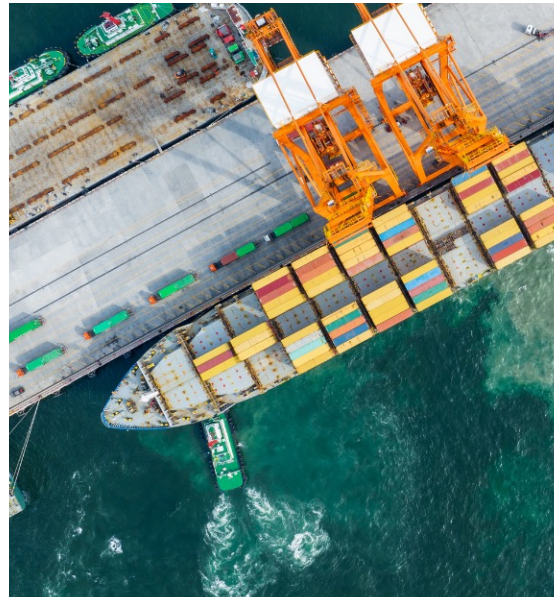
Smart and Green Ports:

- Paradip Port Authority uses AI for berth scheduling, cargo automation, and energy management.
- Sustainability initiatives include planting 1 million trees, a 10 MW solar plant, and shore-to-ship power systems to eliminate diesel use.

Worker Safety and Waste Optimization:

- Steel plants use AI-based computer vision for PPE compliance and to prevent hazardous zone intrusions.
- AI optimizes fly ash and slag reuse in Angul-Jharsuguda, advancing Odisha's circular economy goals.

These efforts highlight Odisha's growing capability to balance industrial growth with environmental responsibility through technology-led governance.



5.4 Multi-Stakeholder Benefits of AI-ESG Integration

AI plays a crucial role in facilitating ESG transformation. Manufacturers can achieve scaled sustainability by integrating AI into energy emissions quality and compliance processes. Impact is illustrated by case studies from Tata Steel Schneider and Siemens while Odisha's own projects in Angul and Paradip demonstrate a balance between environmental responsibility and industrial growth.

The following data however demonstrates why AI-enabled ESG is not to be disregarded and is now the present rather than the future.

For Investors:

- 71% prioritize ESG, making AI-driven sustainability programs more attractive.
- Real-time ESG data opens access to green bonds and sustainability-linked loans.
- Nearly 80% individual investors see financial returns and sustainability compatible.

For Regulators:

- AI automates reporting and risk analysis, easing enforcement.
- Odisha's emissions grading and Paradip's live dashboards shift regulation from punitive to collaborative.

For Industry:

- AI cuts cost, boosts efficiency, and enables eco-friendly innovation.
- Unilever's 35% forecast accuracy improvement, Siemens' 72% reduction in CO₂ emissions.

For Communities:

- AI improves air quality, worker safety, and skilling.
- Examples: Water quality monitoring, safety tools, and Unilever's Braille tech enhance community well-being

Building on the good work already done, and taking inspiration from other global examples, Odisha is set to emerge as a national model for AI-enabled ESG. The opportunity lies in scaling from pilot projects to full-sector transformation—by aligning policy, platform, and partnerships.



5.5 Future Course for Odisha's Policies

For AI-driven ESG initiatives, fairness, explainability and inclusivity are crucial, and they are highlighted in India's National Strategy for AI and Principles for Responsible AI. Odisha's regulatory alignment with EU standards and India's approach may eventually reduce import risk and increase investor confidence.

The following key areas will be essential in the coming years in shaping Odisha's future policies:

Privacy Standards: Strict privacy guidelines are enforced for AI systems handling sensitive or personal data by India's Digital Personal Data Protection (DPDP) Act 2023 guaranteeing data security, consent, and transparency in manufacturing. Industries in Odisha that use AI for worker monitoring or smart logistics will need to align to these standards.

EU AI Act: The EU AI Act places more stringent restrictions on high-risk applications such as industrial automation and worker safety by classifying AI systems according to their level of risk. This means that exporters of steel, chemicals, and other goods from Odisha will have to conform to ethical AI frameworks that are ready for the EU.

AI Ethics & Standards: Manufacturers are forming AI ethics boards, adopting ISO standards like ISO 5339:2024 and establishing transparent governance structures to align with responsible AI practices. With the Odisha AI policy now in place, ethical AI implementation could boost investor confidence.



06

Enabling Ecosystem for AI Adoption

As AI emerges as a key component of global digital transformation, its adoption requires a strong ecosystem. This encompasses not only technology but also digital infrastructure, innovation ecosystems, skilling frameworks, enabling policies and governance models. The foundation for the sustainable implementation of AI in society business and government is the convergence of these elements. Odisha provides a dynamic example of how subnational tactics can support national and international initiatives to promote AI integration.

6.1 AI-Driven Governance and Compliance Automation

Artificial Intelligence (AI) is emerging as a key enabler for improving transparency reducing bureaucratic delays and streamlining regulatory workflows as governments work to modernize public administration.

- **AI significantly reduces administrative workload:** Studies estimate that up to 84% of repetitive transactions in government such as data entry, form processing and document validation can be automated with AI, allowing officials to focus on strategic and high-impact work.
- **India's national strategy integrates AI into compliance mechanisms:** The government has initiated AI pilots in tax administration (detecting GST invoice frauds) and welfare systems (identifying ineligible beneficiaries), improving both efficiency and targeting of services.
- **Odisha is leveraging AI for more responsive governance:** Under the IndiaAI Mission, the state is piloting AI-powered public dashboards, automated tools for at-home health screening and generative AI assistants for teachers—streamlining decision-making and reducing red tape in citizen-facing departments.

6.2 Enabling Policies: Ease of Doing Business and Trade Support

To maximize advanced manufacturing's potential and hasten the adoption of AI, a robust and progressive policy environment is necessary. Both federal and state governments can act as catalysts by streamlining regulations encouraging innovation and promoting smooth trade. The ensuing sections examine how trade logistics, financial incentives, and regulatory simplification policy interventions are creating the framework for an industrial future powered by artificial intelligence.

6.2.1 Policy Frameworks for AI and Advanced Manufacturing

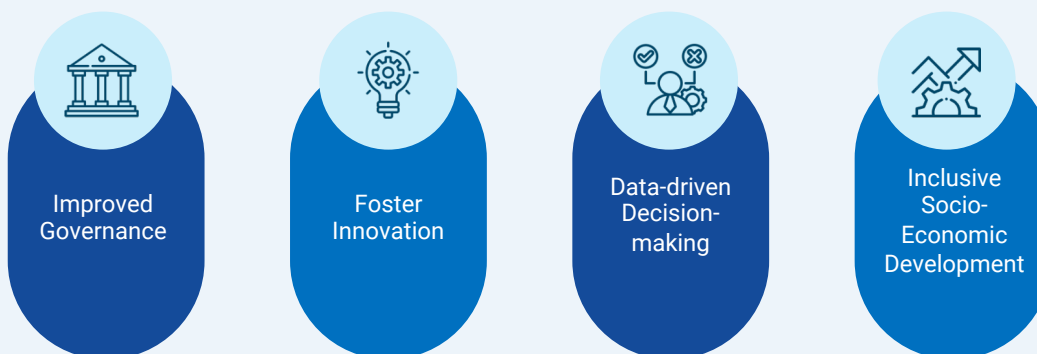
The development of policy frameworks that support technology-led growth has advanced significantly in India especially in fields like artificial intelligence and advanced manufacturing. The National Strategy for Artificial Intelligence (2018) which presented a vision for the inclusive sector-wide deployment of AI is a crucial starting point. More extensive reforms that



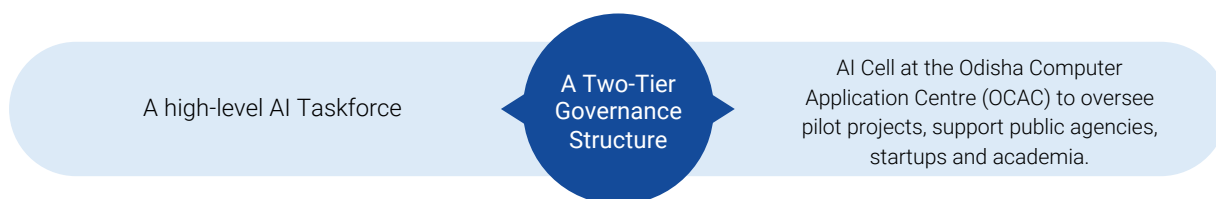
match regulatory frameworks to the requirements of high-tech industries are now supporting this approach.

Odisha AI Policy 2025 – Key Highlights

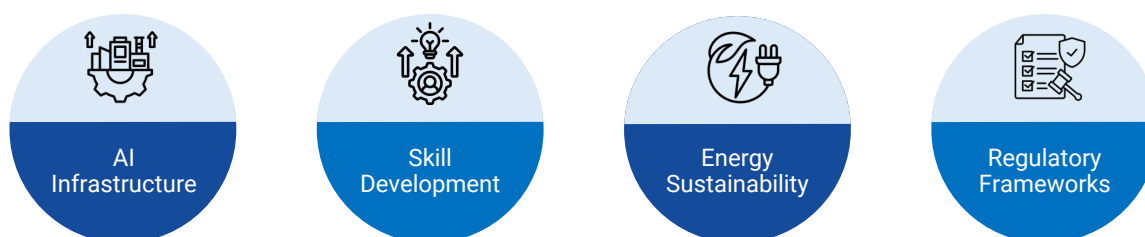
Vision & Objectives:



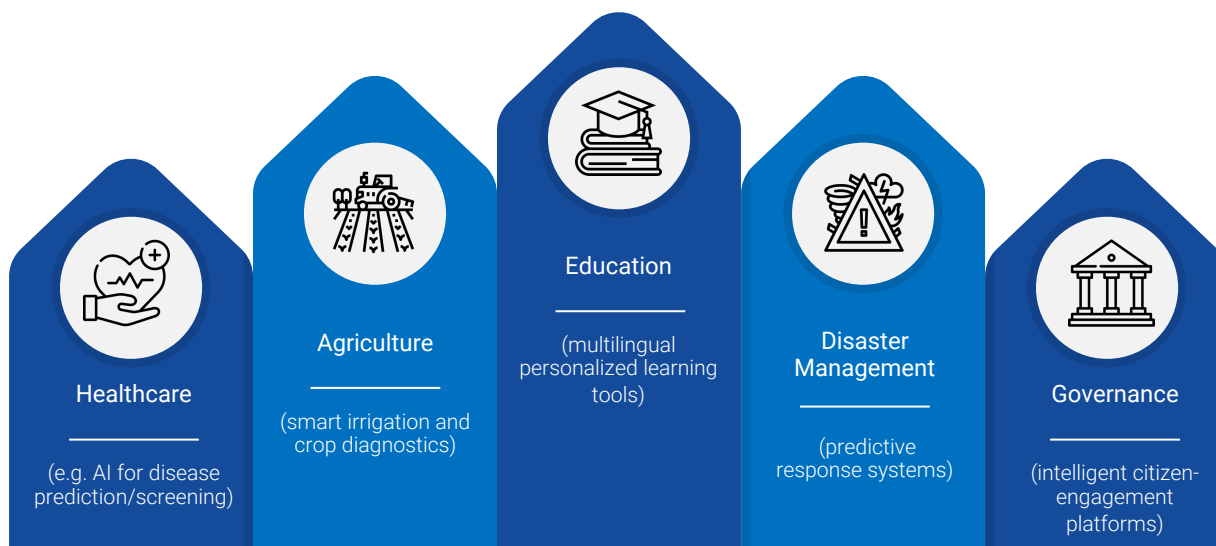
Odisha AI Mission (Institutional Body):



Four Pillars Framework:



Priority Sectors & Responsible AI

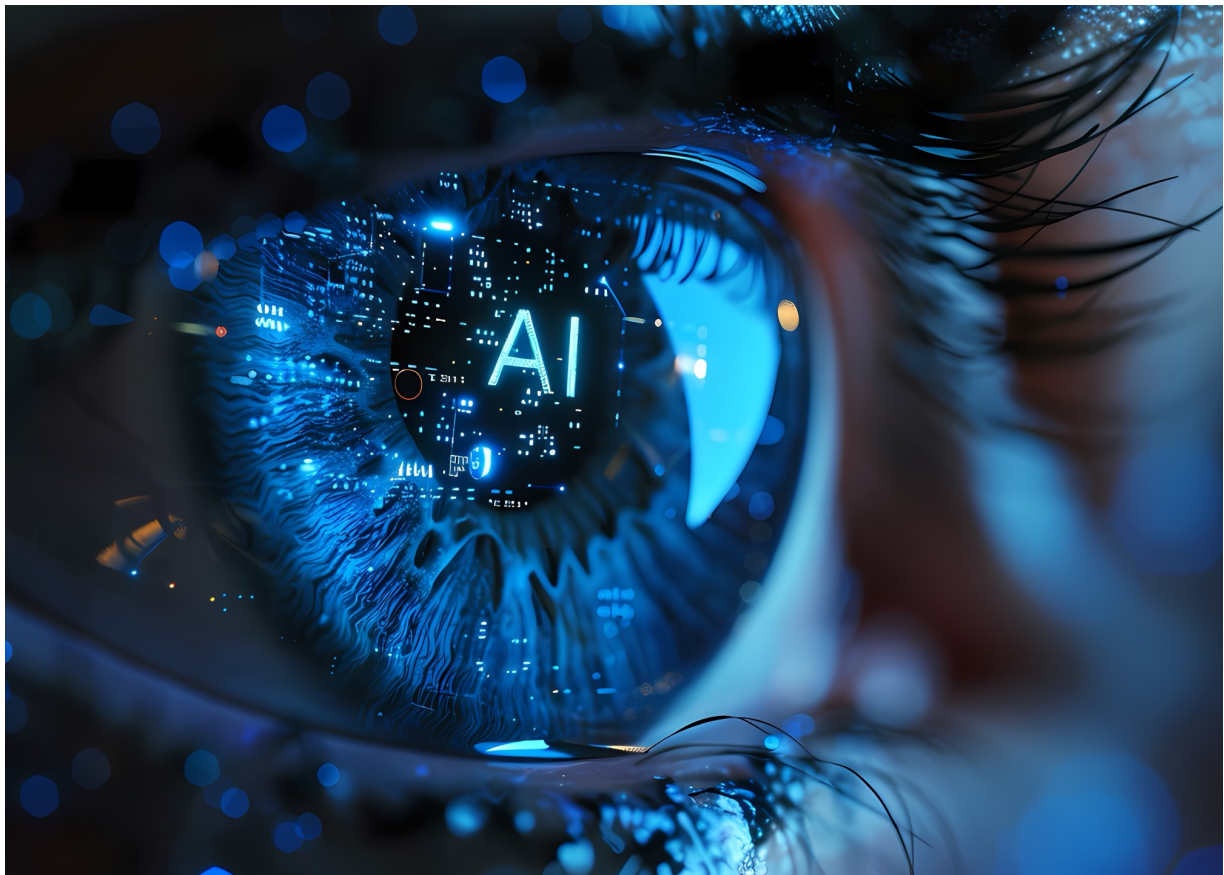


By launching the Odisha AI Mission and identifying high-impact use cases across critical sectors like healthcare, agriculture, education, and disaster management, the policy reflects Odisha's ambition to emerge as a national leader in AI-led transformation. It aligns closely with the Indian AI Mission and emphasizes ethical deployment, robust data governance, and support for startups and academia, positioning Odisha as a future-ready hub in India's evolving AI ecosystem.

6.2.2 Government Reforms Simplifying Procedures and Compliance

The Indian government has undertaken large-scale reforms to simplify procedures, digitize business processes, and reduce compliance burdens.

- **Ease of Doing Business leap:** India improved from **142nd in 2014 to 63rd in 2019**, driven by structural regulatory reforms and digitization.
- **Reduction in compliance burden:** Over **39,000 compliances removed** and **3,400+ outdated legal provisions decriminalized** (Union Budget 2023), fostering a more innovation-friendly regulatory climate.
- **National Single Window System (NSWS):** A unified platform for industrial clearances integrates multiple agencies and departments, streamlining approvals and improving transparency.
- **BRAP (Business Reform Action Plan):** Overseen by DPIIT, this initiative ranks states based on reform progress, fostering healthy competition in regulatory efficiency.
- **Odisha's GO-SWIFT portal:** A state-level single-window platform that has become a model for investor facilitation, providing end-to-end approval tracking and faster clearances.

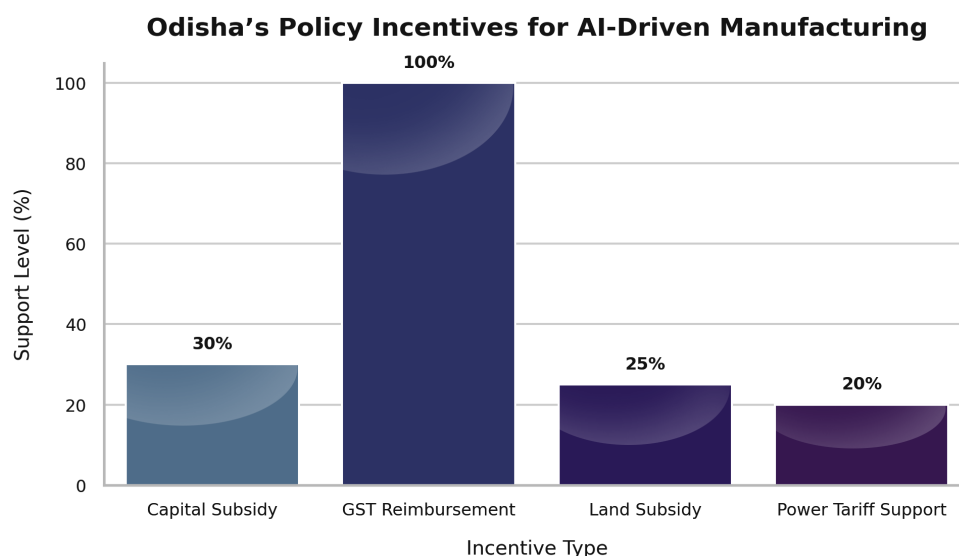


6.2.3 Incentives for AI Adoption, Startups, and MSMEs

India's policy framework provides a range of incentives aimed at catalyzing AI innovation, supporting startup ecosystems, and enabling MSMEs to scale through digital transformation. These financial and regulatory supports are critical for reducing risk, encouraging entrepreneurship, and fostering R&D in AI. India has rolled out several such measures:

- Angel Tax Abolished:** The removal of the angel tax on startup investments helps unlock early-stage funding by removing taxation hurdles for investors supporting innovative startups.
- Reduced Corporate Tax for New Manufacturers:** New manufacturing companies, including those focused on AI hardware and automation tools, benefit from a lower corporate tax rate, improving capital retention and profitability.

- Capital Subsidies under ICT and ESDM Policies:** For AI-focused enterprises, particularly in electronics and digital systems manufacturing, central and state schemes offer CAPEX support for setting up new facilities.
- Reimbursements and Incentives under IPR and ICT:** The IPR 2022 and ICT Policy 2022 offer AI investments 30% capital subsidies, GST reimbursements, and land/power incentives.
- Increased Public R&D Funding:** The government has ramped up R&D investments in emerging technologies, including AI, providing grants and funds for applied research and commercialization.
- Startup India Benefits:** Startups are eligible for income tax exemptions for three consecutive years, credit guarantee schemes, and self-certification under several labor and environmental laws—reducing initial operational burdens.



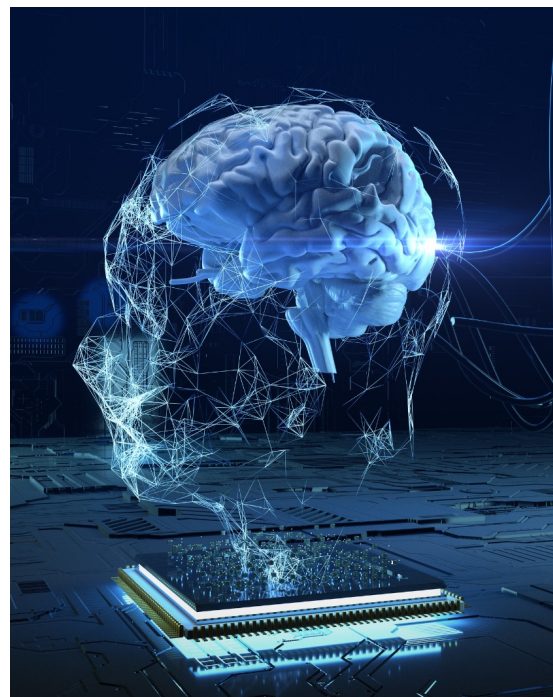
6.3 Mapping Odisha's Existing Innovation Ecosystem

Odisha's progress in fostering innovation and entrepreneurship provides fertile ground for AI startups and industry collaborations..

- Startup growth: Ranked as a "Top Performer" by DPIIT in 2018, 2019, and 2022—showing sustained policy commitment.
- O-Hub in Bhubaneswar: India's largest state-backed incubator with 4 lakh sq. ft., enabling access to workspace, mentoring, and funding.
- Incubators and mentorship: 27+ centres, including sector-specific hubs in agri-tech and biotech.
- Startup Odisha has mentored 1,800+ startups, with 42% women-led.
- Target to support 5,000 startups by 2025 is well within reach.
- Diverse innovations: AI-based fisheries analytics, drone tech for mining, ed-tech, and health-tech platforms.
- CoEs in Bhubaneswar backed by STPI focus on AI/ML, IoT, AR/VR, offering R&D facilities and expert mentoring.

6.4 Sustaining Momentum: Odisha's Path to AI Excellence

Odisha has established a promising foundation for AI-driven innovation through its persistent policy push and infrastructure investments. However, the state must now concentrate on growing sector-specific accelerators incorporating research institutions more thoroughly into the startup ecosystem and developing stronger industry ties for the deployment of AI products if it is to fully realize its potential as an AI hub. Odisha has the potential to lead India's AI-powered industrial transformation if it maintains its strategic focus and keeps developing its ecosystem.



6.5 Infrastructure Needs: Data Centres, Edge Computing, Connectivity

A robust digital infrastructure is the backbone of any AI-driven economy. As AI applications become increasingly data-intensive and time-sensitive, foundational investments in computing power, storage, and connectivity are essential to support innovation in sectors like manufacturing, healthcare, governance, and education. From hyperscale data centers to rural broadband, the entire digital stack must be prepared to scale with India's AI ambitions. The following points highlight the exponential increase in computing needs driven by artificial intelligence:

- **Rising Global Demand:** AI-related workloads are expected to account for 70% of global data centre demand by 2030, with AI-ready computing capacity growing by 33% annually between 2023 and 2030.
- **Hyperscale Expansion:** Cloud giants like AWS, Microsoft, and Google are doubling their data centre footprints, crossing 1,000 hyperscale centres globally by 2024, as demand for storage and compute accelerates.
- **Edge Computing Surge:** With the proliferation of IoT and 5G, edge data centre—smaller, localized computing hubs—are crucial to reduce latency. The global edge data centre market is expected to grow from \$20 billion in 2024 to \$110 billion by 2034.



- **India's Momentum:** Valued at \$6.5 billion in 2024, the Indian data centre market is projected to double by 2025–26, driven by growing cloud adoption, personal data protection mandates, and digital transformation across industries.
- **Connectivity Infrastructure:** Under the BharatNet project, India has connected over 180,000 Gram Panchayats via fiber-optic broadband. Simultaneously, 5G deployment is expanding rapidly, reaching hundreds of cities and enabling low-latency applications.

These foundational capabilities like data centre capacity, edge computing, and high-speed broadband form the digital bedrock required to unlock the full potential of AI and Industry 4.0 across all sectors. To meet rising global expectations, India must establish forward-looking policies that facilitate AI adoption, invest in robust infrastructure, and strengthen its global competitiveness and operational effectiveness.

6.6 Bridging the Digital Infrastructure Gap

To fully harness the potential of AI and Industry 4.0, India and states like Odisha must address critical infrastructure gaps. Strengthening foundational digital infrastructure such as data centers, edge computing nodes, and high-speed connectivity will be essential to support scalable, inclusive, and secure AI deployment. Going forward, the focus must be on swift execution, cross-sector collaboration, and measurable outcomes particularly in real-world pilots and AI skilling. With strong leadership and consistent investment, Odisha has the potential to become a model for subnational AI governance in India, setting benchmarks in both policy design and implementation.

The following recommendations outline actionable steps at both national and state levels.

National-Level Recommendations for India

● **Decentralize Data Center Infrastructure:**

Encourage development of data centers in Tier 2 and Tier 3 cities through tax incentives, subsidized power, and land allotment.

● **Promote Public-Private Partnerships (PPP) for Edge Computing:** Support PPP models to establish micro data hubs in rural areas for localized AI deployment in agriculture, healthcare, and e-governance.

● **Invest in Green, AI-Ready Infrastructure:** Mandate energy-efficient, renewable-powered data centers as part of India's climate commitments.



- **Support the creation of AI-specialized data zones** with high-performance computing clusters for startups and academia.
- **Expand BharatNet and 5G Coverage:** Accelerate fiber optic rollout under BharatNet to cover the remaining gram panchayats, ensuring every village can support digital and AI-based services.
- **Speed up affordable 5G coverage** in semi-urban and industrial belts to enable real-time AI applications.
- **Build District-Level Edge Nodes:** Pilot mini data centers in industrial towns and rural blocks to support localized AI use cases (e.g., smart agriculture, local health diagnostics).
- **Leverage Port Connectivity for Data Logistics:** Position Odisha's ports (e.g., Paradip, Dhamra) as logistics hubs not just for goods, but also for undersea internet cables and data exchange, attracting global cloud providers.
- **Digitize Government-Industry Interfaces:** Expand Odisha's GO-SWIFT portal capabilities to integrate with national Single Window Systems and use AI-based backend analytics to reduce approval delays.
- **Operationalize the Hyperscale Data Center Park:** Fast-track approvals and investment partnerships for the proposed data center park near Bhubaneswar and position it as an East India digital hub.
- **Ensure Rural Broadband Access:** Partner with private ISPs and central agencies to bridge last-mile connectivity gaps in tribal and forest regions of the state—crucial for equitable digital and AI access.

State-Level Recommendations for Odisha



07

Collaboration Models and Implementation Roadmap

Phased implementation strategies along with strong industry-academia-government alliances and public-private partnerships (PPPs) are essential for successfully integrating artificial intelligence (AI) in manufacturing. To help stakeholders in achieving scalable, ethical and impactful AI adoption, this section provides frameworks models for collaboration and quantifiable results.

7.1

Framework for Public-Private Partnership (PPP) in AI Adoption

Around the world artificial intelligence (AI) is changing industries and posing both difficult problems and enormous opportunities. In India where AI could boost GDP by \$500 billion by 2025–2026, a balanced approach is needed to ensure its

ethical development and broad adoption. Public-Private Partnerships (PPPs) become an important framework in this situation guaranteeing long-term sustainability responsible implementation and fair access. Here are the essential elements:

A. Governance and Ethical Guidelines: Structuring Trust in AI

To ensure AI development is responsible and aligned with ethical principles, joint governance frameworks are essential. Countries like Singapore have set global benchmarks with their National AI Strategy 2.0, which brings together over 100 experts from academia, industry, and government to create a trusted AI ecosystem focused on addressing major global challenges, including healthcare and climate change. India is taking a similar approach, with AI projected to be a key economic driver across sectors.

7.2 Some of the case studies across globally:



Case Study 1:

Singapore's National AI Strategy 2.0

This initiative exemplifies how public-private partnerships (PPPs) can drive ethical, inclusive, and sustainable AI development. Launched as a continuation of its original strategy, this framework integrates over a hundred experts from academia, industry, and government to foster innovation, address global challenges, and ensure responsible AI usage across sectors. By empowering citizens and businesses to adopt AI responsibly, Singapore showcases a holistic model of collaboration that bridges the AI divide and sets a precedent for international cooperation in AI advancement.

Application: The role of PPPs in Singapore's strategy illustrates three key applications:



Case Study 2:

India's AI Mission replicating the success of Digital India, integrating AI into governance and Industry through PPP Model

The broader vision of IndiaAI is to *"bolster India's global leadership in AI, foster technological self-reliance, ensure ethical and responsible AI deployment, and democratize the benefits of AI across all strata of society"*. A landmark initiative replicating the success of Digital India, the IndiaAI Mission was launched on March 7, 2024, as a public-private partnership model to transform India into a global AI powerhouse. The mission reflects the Indian government's commitment to integrating artificial intelligence into governance and industry, accelerating economic development, and ensuring ethical, inclusive technology deployment.

Application: India's AI Mission through PPPs demonstrates several strategic applications:

01**Bridging the Resource and Expertise Gap**

- Combines government oversight with private sector innovation
- Government provides funding, regulations, and public data access
- Private firms offer AI tools, technical talent, and market-driven solutions
- Accelerates AI deployment for social good (e.g., healthcare, climate resilience)

Fostering Cross-Border Collaboration**02**

- Encourages international AI knowledge sharing
- Facilitates ethical technology transfer between nations
- Promotes equitable distribution of AI benefits globally

03**Ensuring Multi-Stakeholder Engagement**

- Involves civil society, local communities, and NGOs
- Brings diverse ethical, social, and cultural perspectives into AI design
- Builds trust and encourages inclusive AI adoption

01**STRENGTHENING AI INFRASTRUCTURE & INNOVATION**

- ₹10,372 crore (~US\$1.3B) public investment in AI infrastructure
- Collaboration with IT/ITES leaders (TCS, Infosys, Wipro) to develop platforms like AI WisdomNext and Topaz

02**ENABLING WORKFORCE TRANSFORMATION**

- India poised to become the world's 3rd largest AI talent base by 2027
- Over 775,000 IT professionals trained in GenAI by top 5 service providers
- Future skills and private skilling initiatives reskill the workforce for GenAI opportunities

03**DRIVING INDUSTRY- WIDE ADOPTION OF AI**

- AI applied across BFSI, healthcare, energy, manufacturing, and customer service
- Indian IT/ITES firms integrating GenAI into service delivery (CX, automation, code generation)
- Outcome-based AI services replacing traditional time-based business models

04**DEMOCRATIZING ACCESS TO AI & DATA**

- Plans for India-specific LLMs and datasets for sectors like agriculture, mobility, and healthcare
- AI guardrails for ethical use: consent, transparency, model explainability.

05**CREATING A GLOBAL AI ECONOMIC ENGINE**

- IndiaAI aims to emulate Digital India's success with startup engagement and PPPs
- IT/ITES firms becoming catalysts in public-private innovation for inclusive growth
- Strategic move toward making India a sustainable, AI-enabled global economy by 2030.

7.3 Phased Roadmap for AI Adoption

Phase 1

Discover and Strategize



Focuses on building organizational awareness and setting a strategic vision.

Conduct feasibility studies, define clear objectives & KPIs & begin AI awareness programs

Stakeholder engagement is critical & provide education and training programs

Small-scale pilot projects with clear ROI potential (e.g. chatbots, fraud detection) with low-risk values

Experiment with various AI tools and platforms

Gather feedback and measure pilot outcomes

Focus is on lessons learned for future scaling, iterating, and refining approaches



Phase 2

Experimentation & Pilot Projects

Expand successful AI applications of pilot projects and standardize AI tools and processes

Invest in robust data infrastructure and technology

Goal is to move from isolated pilots to enterprise wide adoption, achieving measurable improvements in productivity and business performance

Monitor performance and optimize models for efficiency Enterprise

Phase 3

Optimization & Scaling



Institutionalize AI governance and ethical frameworks

Foster a culture of innovation and responsible AI use

Scale AI to drive new business models and revenue streams

Continuously monitor, audit, and improve AI systems



Phase 4

Enterprise Transformation

7.4 Metrics for Success

With 92% of executives planning to increase AI spending by 2028, robust metrics are essential for tracking progress and demonstrating value, guiding continuous improvement, and ensuring alignment with business objectives.

The following metrics shall be elaborated to assess the validation and continuous process:



Continuous Monitoring:

KPIs must be thoroughly developed and regularly updated to ensure alignment with business objectives and evolving technology landscapes.



Through the use of strong PPP frameworks, triple helix collaborations, a phased implementation roadmap, and meticulous outcome measurement, stakeholders can guarantee that the adoption of AI is not only impactful and scalable but also morally and inclusively sound. Despite the complexity of the journey India is well-positioned to spearhead the next industrial revolution if the appropriate models and metrics are used.

08

Conclusion: Odisha's Moment to Lead in AI-Driven Manufacturing

As AI reshapes the global industrial landscape, Odisha stands at a strategic inflection point. With its well-established industrial base, growing digital ecosystem, and proactive governance, the state has the core ingredients to lead the next phase of AI-enabled industrial transformation in India.

Odisha's approach must balance ambition with execution. Rather than waiting for national momentum, the state can catalyze its own AI journey through focused, collaborative, and outcome-oriented initiatives.



8.1 Strategic Imperatives for the State

1. Establish Odisha as a Model for AI-Enabled Industrial Growth

Launch a flagship AI Manufacturing Mission with cross-sectoral pilots and a five-year transformation roadmap.

2. Bridge Policy and Practice

Operationalize existing industrial and IT policies with clear enablers for AI adoption - such as incentives, sandboxes, and procurement pathways for startups.

3. Institutionalizing Innovation Ecosystems

Build strong linkages between industries, academia (IIT, IIIT, NIT etc.) and startups to create AI centers of excellence and shared R&D platforms.

4. Enable MSME Readiness

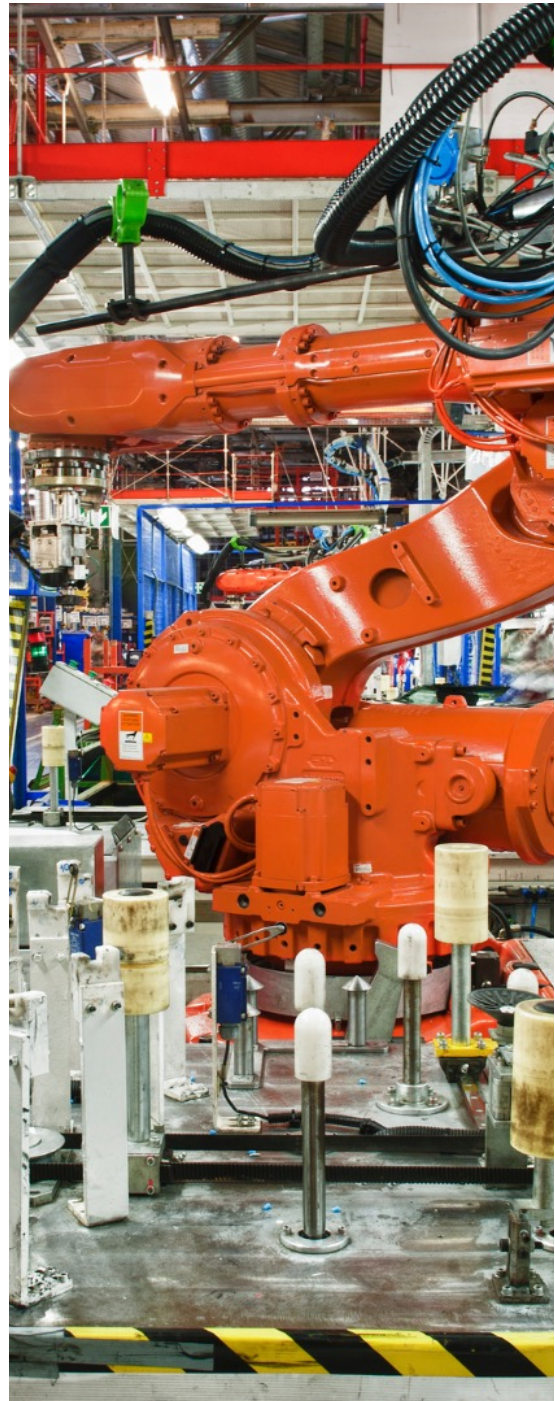
Focus on cluster-based handholding, skilling and digital upgradation of small and medium manufacturers across sectors like textiles, food processing and auto components.

5. Measure, Iterate, Scale

Use real-time dashboards and independent assessments to measure impact, refine interventions, and scale what works across districts and sectors.

8.2 The Time is Now

AI is no longer a future possibility - it is a present-day competitive advantage. If Odisha acts decisively today, it can build a future-ready manufacturing economy that is intelligent, inclusive and sustainable. This report serves as both a blueprint and a call to action.



About ASSOCHAM



ASSOCHAM initiated its endeavor of value creation for Indian industry in 1920. It brings in actionable insights to strengthen the Indian ecosystem, leveraging its network of more than 4,50,000 members, of which MSMEs represent a large segment. With a strong presence in states, and key cities globally, ASSOCHAM also has more than 400 associations, federations and regional chambers in its fold.

Aligned with the vision of creating a New India, ASSOCHAM works as a conduit between the industry and the Government. The Chamber is an agile and forward-looking institution, leading various initiatives to enhance the global competitiveness of the Indian industry, while strengthening the domestic ecosystem. With more than 100 national and regional sector councils, ASSOCHAM is an impactful representative of the Indian industry. These Councils are led by well known industry leaders, academicians, economists and independent professionals. The Chamber focuses on aligning critical needs and interests of the industry with the growth aspirations of the nation.

ASSOCHAM is working hand in hand with the government, regulators and national and international think tanks to contribute to the policy making process and share vital feedback on implementation of decisions of far-reaching consequences. In line with its focus on being future-ready, the Chamber is building a strong network of knowledge architects. Thus, ASSOCHAM is all set to redefine the dynamics of growth and development in the technology-driven 'Knowledge-Based Economy'. The Chamber aims to empower stakeholders in the Indian economy by inculcating knowledge that will be the catalyst of growth in the dynamic global environment.

Vision

Be the knowledge architect for the Indian economy, with a focus on strengthening India's domestic ecosystem and enhancing global competitiveness.

Mission

Its mission is to impact the policy and legislative environment so as to foster balanced economic, industrial and social development.

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Primus Partners has been set up to partner with clients in 'navigating' India, by experts with decades of experience in doing so for large global firms. Set up on the principle of 'Idea Realization', it brings to bear 'experience in action'. 'Idea Realization'— a unique approach to examine futuristic ideas required for the growth of an organization or a sector or geography, from the perspective of assured on ground implementability.

Our core strength comes from our founding partners, who are goal-oriented, with extensive hands-on experience and subject-matter expertise, which is well recognized in the industry. Established by seasoned industry leaders with extensive experience in global organizations, Primus Partners boasts a team of over 250 consultants and additional advisors, showcasing some of the finest talent in the nation.

The firm has a presence across multiple cities in India, as well as Dubai, UAE. In addition, the firm has successfully executed projects across Africa, Asia Pacific and the Americas.

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