Get Ready for the Future: Embrace Industry 4.0 with the Elpis Smart Manufacturing Platform

Setting the stage

Globally, Industry 4.0 has evolved from a digital transformation exercise in 2011 to must-have superior customer experience and sustainable business models in 2024. However, in India, Industry 4.0 is at an inflection point - there is an intent and urgency to scale up foundational readiness in Cloud, Robotic Process Automation (RPA), IoT and Big Data and to enhance capabilities in use cases that will result in globally connected smart factories.

The manufacturing industry, especially micro, small and medium enterprises (MSMEs) with 50-100 machines, faces considerable challenges when transitioning towards smart manufacturing. However, the promise of **Industry 4.0**—the integration of smart technologies like IoT, predictive analytics, and automation—provides a transformative opportunity for manufacturers to enhance productivity, reduce costs, and compete globally.

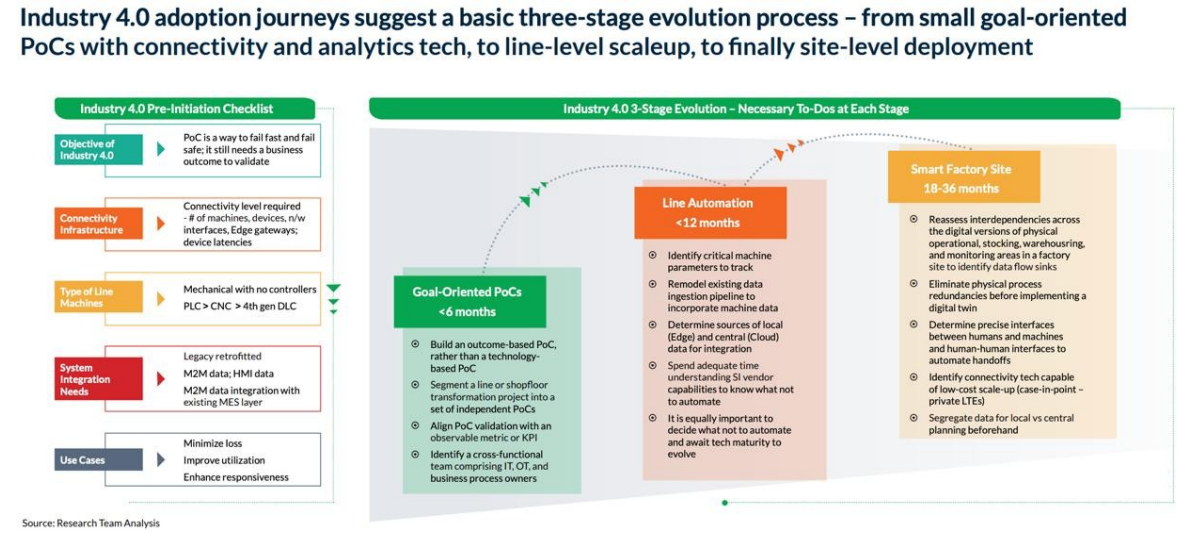
Current Challenges by Indian Manufacturers

- **Legacy Equipment Dependency :** Limited connectivity and inability to collect real-time data restrict operational transparency. Older machinery is energy-inefficient and prone to breakdowns, increasing costs.
- **Data Incompatibility :** Systems generate unstructured data, which lacks standardized formats for actionable insights.
- **Rising Energy Costs :** Energy inefficiencies inflate operational expenses, especially for mid-sized manufacturers.
- **Frequent Breakdowns :** Unscheduled downtimes due to outdated maintenance practices disrupt production.

These obstacles hinder the adoption of modern Industry 4.0 principles, which are crucial for improving operational efficiency, reducing costs, and maintaining competitiveness.

A NASSCOM report indicates that one of the common challenges that manufacturing companies face is siloed systems, resulting in failed industry 4.0 implementation. This happens as data and insights from systems cannot be used beyond a certain point due to a lack of integration as they cannot connect to other systems, workflows, or other transactional systems. Therefore, organisations are unable to leverage the full potential of Industry 4.0.

To counter this, Industry 4.0 adoption should enable companies to *rethink* their silo-ed business and operational KPIs and to exploit synergies with seamless data flow and real-time decisions. Rather than integrating multiple Proof-of-Concepts (PoCs), it is critical to start with an enterprise-wide adoption view and break it into smaller projects. This has been the signature of successful Industry 4.0 implementations.

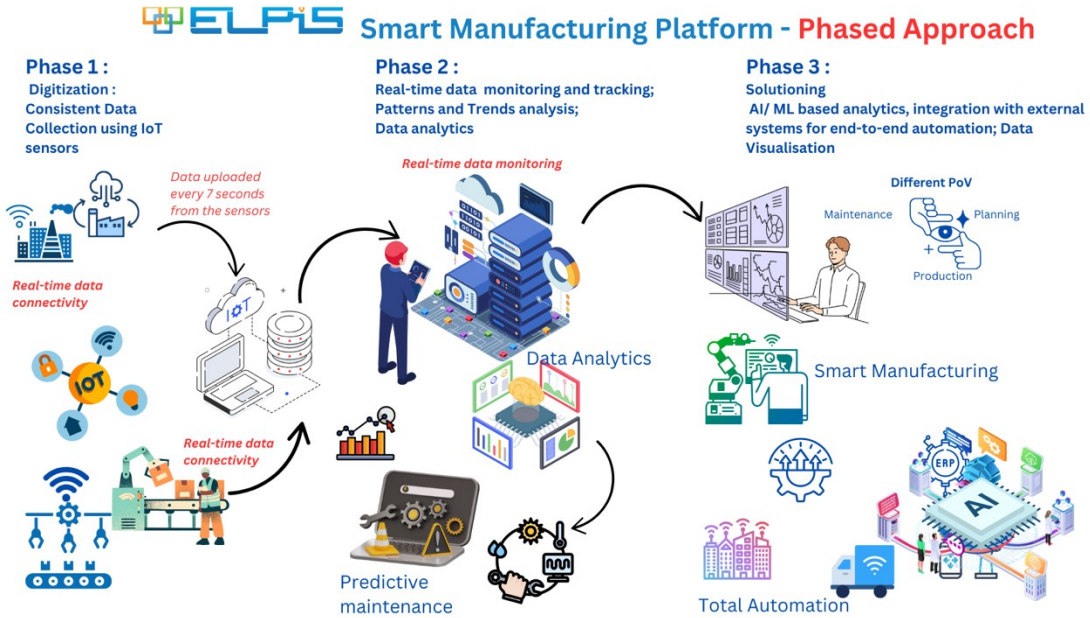


Ref: Nasscom - India Industry 4.0 adoption

To stay competitive in the global marketplace, MSMEs must evolve from a PoC stage to a Smart Factory stage.

The Elpis Solution: A Gateway to Smart Manufacturing

The **Elpis Smart Manufacturing Platform** is a comprehensive framework tailored for MSMEs. Its modular, scalable solutions empower businesses to transition towards Industry 4.0 gradually while maximizing ROI.

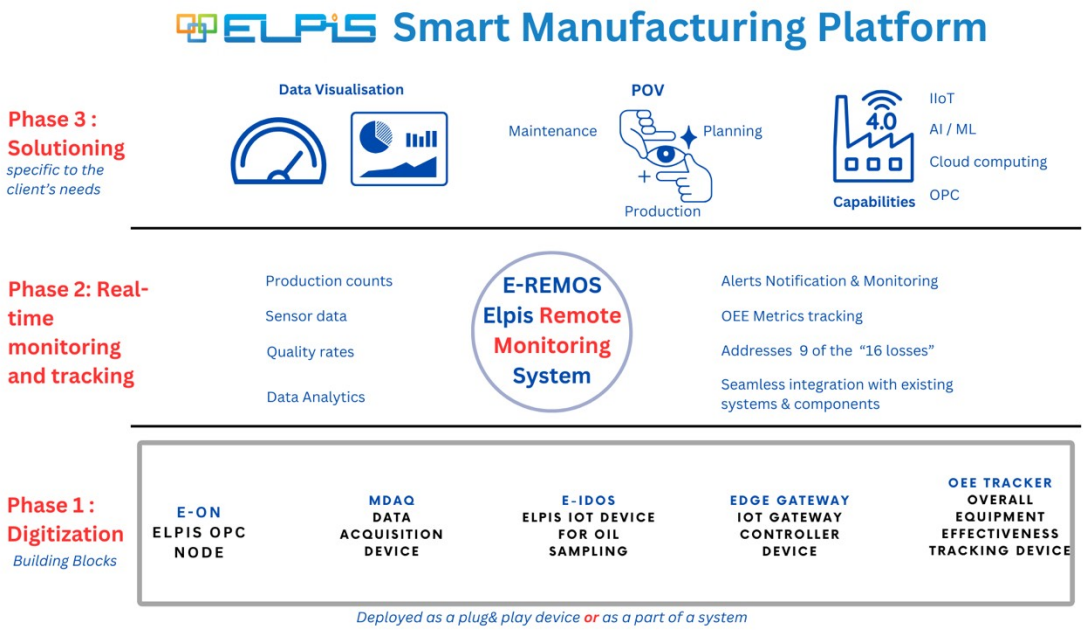


Key Components:

1. **E-REMOS:** The core IoT system ingests real-time data from multiple sensors, tracking parameters such as temperature, pressure, energy use, and production metrics. The

web interface allows for configuration, monitoring, and analytics. Interface with other embedded system software, allowing for semi-automation are other key factors to enable adoption. The sensors can be configured for different thresholds for various parameters with email and audio alerts. E-REMOS computes the OEE (Overall Equipment Effectiveness) along with production metrics e.g. planned vs actual, rejection rates etc. The statuses of the various devices and each measured parameter can be tracked which can be downloaded and shared for decision making. These dashboards and reports are customizable for different user roles and industries. The system also allows for different analytical perspectives (maintenance, production, planning).

2. **A suite of ready-to-deploy IIoT products** that can be used independently for quick RoI or as a part of a larger solution towards smart manufacturing enablement
3. **Solutioning :** In addition to the above, client and industry specific solutioning helps MSMEs visualise the data to take corrective action along with informed decision by the management.
    - Predictive Analytics
    - **Customizable Dashboards:** Visualizations tailored to specific roles provide actionable insights for maintenance, production, and strategic planning.



Key benefits:

- **Phased Transition Approach:**
    - **Phase 1**: Digitizing analog data from legacy machines.
    - **Phase 2**: Implementing real-time remote monitoring across the plants.
    - **Phase 3**: Advancing to predictive analytics, automation, and AI-driven decision-making.
- Integration of legacy equipment; no need for expensive equipment overhaul
- Computation of Overall Equipment Effectiveness (OEE)
- Predictive Maintenance: Reducing unplanned through early detection of potential failures.

- Lower Maintenance Costs: Reduction in maintenance expenses by moving from scheduled maintenance to condition-based monitoring.
- Enhanced Quality Control: Real-time monitoring helps prevent defects, leading to improved product quality.
- Energy Efficiency: Optimizing operational parameters to lower energy consumption and reduce environmental impact.

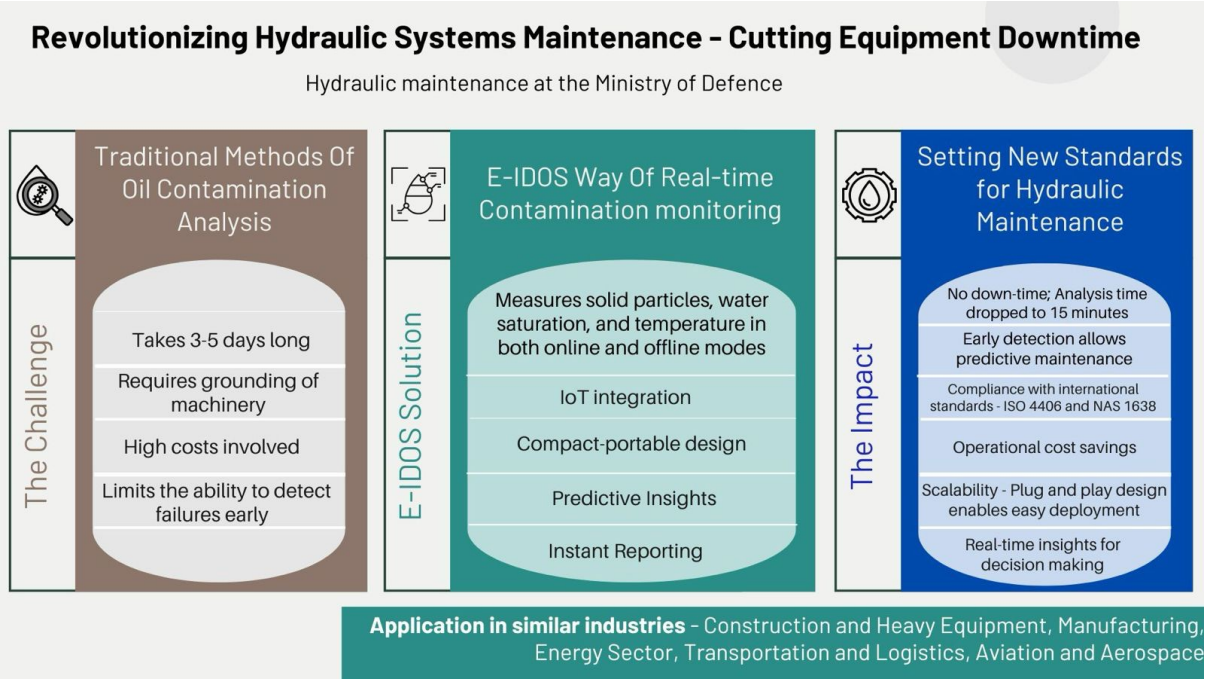
In addition, adoption of the smart manufacturing principles have additional benefits too in terms of Enhanced Decision-Making for Management:

- Centralized, real-time data analytics allows management to make informed decisions quickly, boosting responsiveness to market changes.
- Transitioning towards process-dependent operations reduces reliance on skilled labour, thus minimizing reskilling needs and training costs.

Success Stories Across Industries

The Elpis platform's versatility extends across a wide range of industries, delivering results aligned with the principles of Industry 4.0.

1. Hydraulic Systems Maintenance



2. Cold Chain Integrity with Real-time Temperature Monitoring