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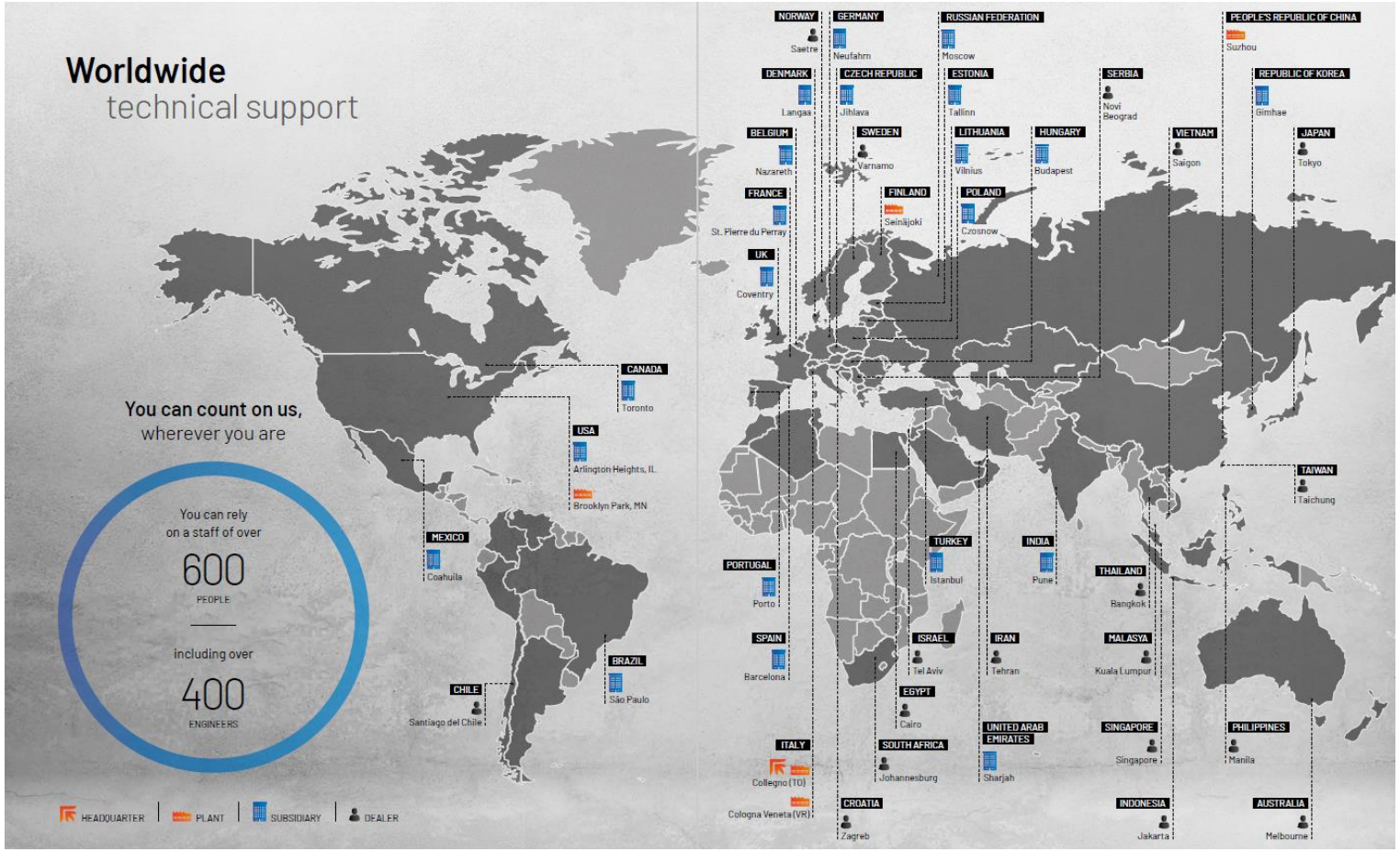
PRIMA USE CASE – SCENARIO



PRIMA Service Engineers over **400**

Maintenance Service external suppliers over **35**

Systems connected to Fleet Management over **8500** and Data volume increase more than **1.5 GByte/day**

Direct suppliers about **1000**

TXT
The Global Digital Enabler

€305M Revenues FY 2024

Solid Financial structure

Guaranteed by operating
excellence & innovation

July 2000
Listed on the Italian Stock Exchange

STAR segment (TXT.MI)

20
Locations
worldwide

30+
Certified Cross-Industry Quality

Years
Experience

2700+
Specialised Know-how

Specialised engineers & professionals

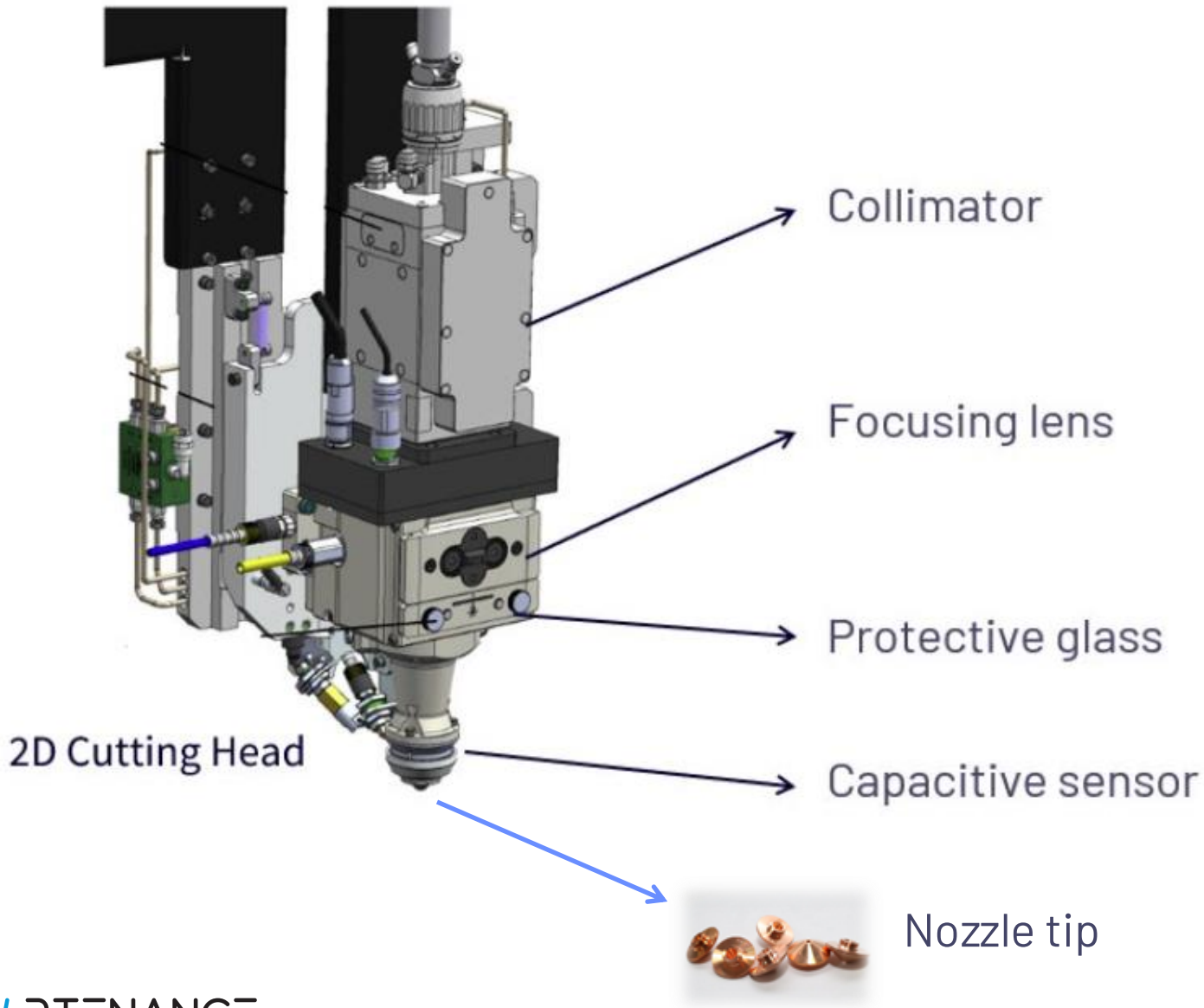
SM4RTENANCE

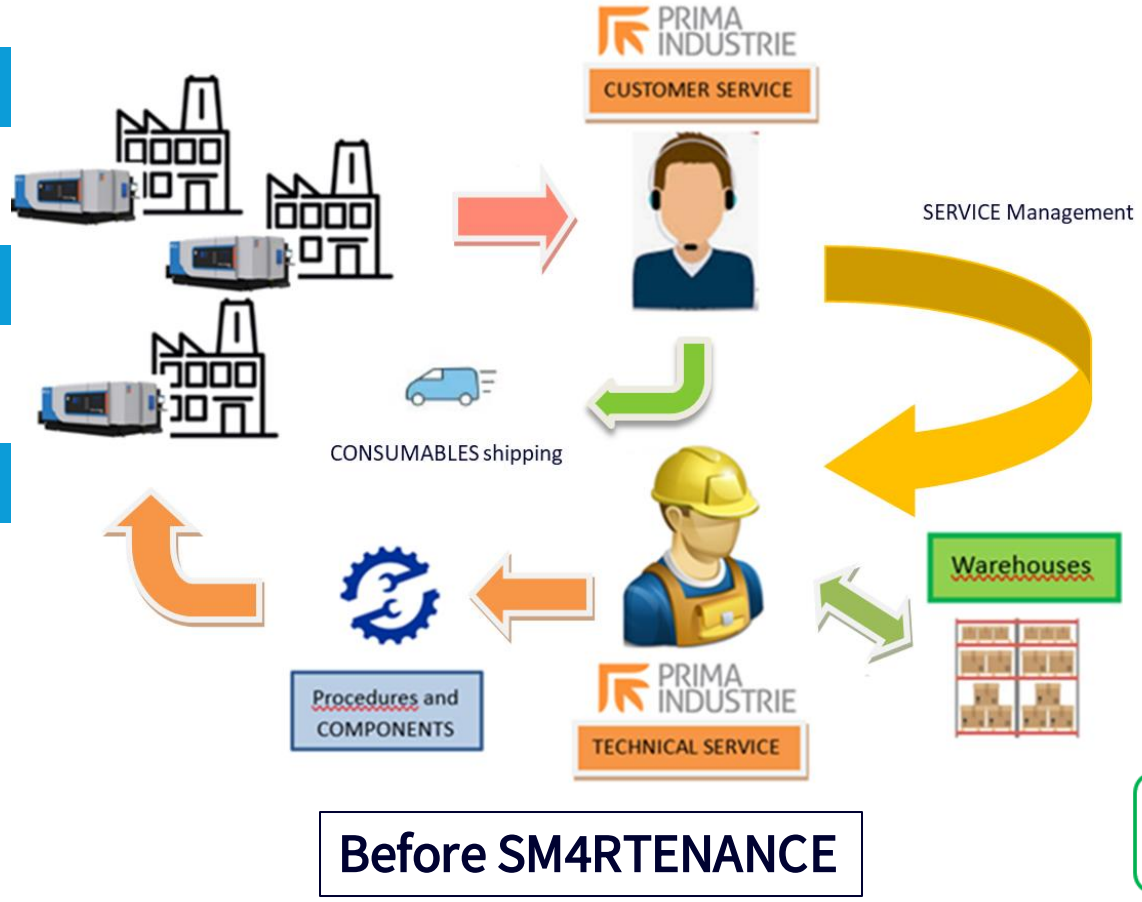
PRIMA Use Case Overview

PRIMA Industrie is developing its proprietary AI solution that will, in the context of the SM4RTENANCE Pilot, enable Predictive Maintenance applications.

The goal of the process is to monitor the condition and functioning of the components of the optical chains, which all must operate in perfect condition for the 2D cutting process to run properly.

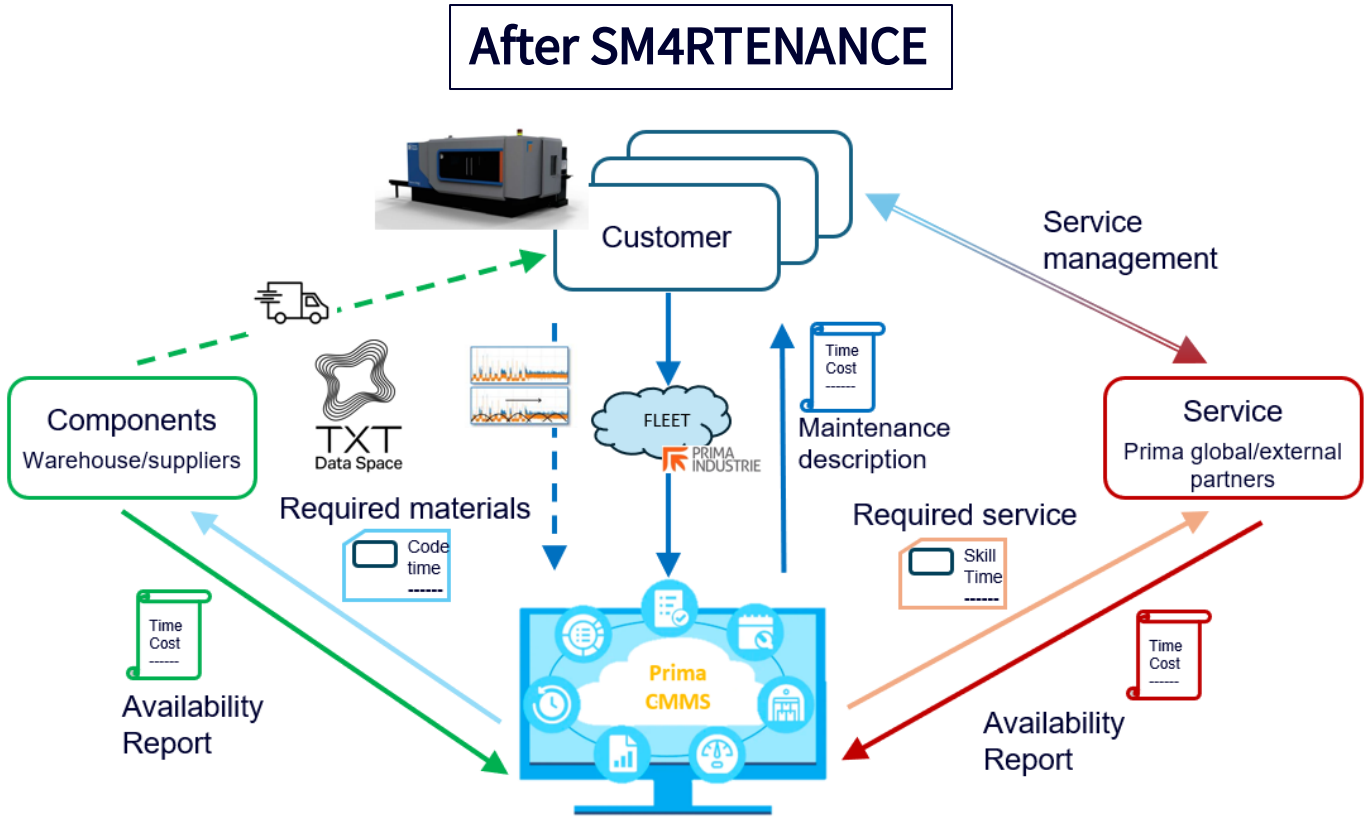
TXT support the Use Case as Technological partner implementing PRIMA Data Space ecosystem.





Before SM4RTENANCE

After SM4RTENANCE



SM4RTENANCE

AI FACTORY for the PRIMA Pilot DATA 5V challenge

Starting Point

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Volume and Variety of the Data enabled through HPC

Volume: PRIMA use case can scale from millions to billions of records (IoT sensors, machine logs, historical maintenance data).

Variety: After SM4RTENANCE, heterogeneous data (CAD 3D models, high frequency laser process signals, thermographic images, XR videos, IoT streams, technical documents) can be integrated.

Velocity: Real-time streaming from hundreds or thousands of assets (i.e., Process data from PRIMA systems installed at the worldwide customers' plants)

Veracity: Need for validation and cleaning of massive datasets (i.e., validating sensor readings against historical patterns and filtering out noise or faulty signals)

Value: Complex analytics to extract predictive and generative insights (i.e., optimizing PRIMA's spare parts inventory and services or generating sustainable product designs)

AI FACTORY Services for SM4RT PRIMA Pilot

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Why AI FACTORY SERVICES?

AI-Optimized Supercomputing: AI FACTORIES host cutting-edge HPC systems designed specifically for AI workloads, offering up to 40× higher performance for training and inference compared to standard HPC.

Integration with European Data Spaces: Fully aligned with GAIA-X and FAIR principles, enabling secure, interoperable, and federated data sharing—ideal for PRIMA's Data Space approach.

Advanced AI Services: Provides pre-configured environments (e.g., Jupyter on HPC), access to pre-trained models, and "test-before-invest" services for SMEs and research projects.

Compliance and Trust: Supports EU AI Act requirements, including bias detection, security audits, and regulatory guidance for trustworthy AI.

Strategic Ecosystem: Connects research, industry, and public administration through a one-stop-shop model, fostering innovation in manufacturing, sustainability, and XR.

European Technological Sovereignty: Co-funded by EuroHPC JU and Italian institutions, ensuring long-term sustainability and compliance with European standards.

AI FACTORY Applications for SM4RT PRIMA Pilot

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Advanced AI Applications through HPC

Model Type	PRIMA Use Case	HPC role
Hybrid Predictive Maintenance	Predict failures of Laser cutting optical chain components	Requires massive parallelization for training and simulation integration
Generative AI for Circular Design	Generate eco-friendly component designs. Track the use of components throughout their lifespan for reuse and recycling purposes	High GPU demand for multimodal generative models and iterative optimization
Digital Twin with Real-Time Simulation	Simulate laser cutting process to increase quality and energy efficiency	HPC accelerates simulation and RL training across thousands of scenarios
XR/Metaverse Interaction Models	Immersive maintenance training and troubleshooting	HPC needed for rendering and AI inference at scale for real-time XR environments
Supply Chain Optimization	Optimize spare parts and services management under circular economy principles	HPC enables fast computation on large graphs and complex optimization algorithms