



AI4QUOTE — Explainable AI & Digital Twin within AIMI Platform
SMART 9th Call 2025



 **smart**
advanced manufacturing

ORGANISATION PROFILE

MECASYS s.r.o. (Slovakia)

Role: Industrial pilot & validation site

Expertise: Precision machining, AI-driven production optimisation, ERP integration, digital twin implementation

Contribution: SK-medium pilot (two CNC cells via CNC/PLC events, minimal sensors where needed), KPI validation, ERP norm/enrichment, exploitation."

Experience: EU projects (Eurostars, Horizon, national R&D); ISO 9001 & 14001

PULSAR SOLUTIONS s.r.o. (Czech Republic)

Role: AI integrator and software developer

Expertise: Machine learning, OCR/CAD feature extraction, ETL pipelines, ERP/MES connectivity, digital twin architecture

Contribution: Lead WP2 (Digital Twin) and WP3 (AI4QUOTE core); ETL pipelines; ERP/MES connectors; XAI & uncertainty visualisation; AIMI integration.

Experience: SME-specialised integrator in AI, predictive analytics and cost estimation systems

Coordinator

Role: Research coordination & AIMI platform integration

Expertise: Explainable AI, digital manufacturing architectures, interoperability standards

Contribution: AIMI data layer, GDPR/AI Act compliance, consortium coordination

Sustainability / LCA Partner

Role: LCA & sustainability module

Expertise: LCA, eco-efficiency analysis, environmental performance modelling

Contribution: LCA-based eco-costing dashboard, sustainability KPIs & validation

Industrial Validation Partner

Role: Secondary pilot site — validation & replication

Additional R&D Partner (University / AI Lab)

Role: Explainable AI, AI Act compliance and model auditing

PROPOSAL INTRODUCTION (I)

Vision:

To empower European manufacturing SMEs with trusted and explainable artificial intelligence that automates quotation, improves cost prediction, and integrates environmental sustainability into every production decision through the AIMI digital platform.

Motivation:

Manufacturing SMEs lose valuable time and margins due to manual, experience-based quotation processes. Existing ERP systems lack predictive intelligence and sustainability insights.

AI4QUOTE addresses this challenge by combining AI costing models, digital twin technologies, and LCA (Life Cycle Assessment) within the AIMI (AI-Driven Manufacturing Intelligence) platform.

The project expands on previous R&D foundations and scales into a multi-country collaboration reaching TRL 7, directly aligned with SMART Cluster priorities on AI & Data, Digitally Enabled Manufacturing, and Sustainability.

Content:

- Development of an explainable AI costing engine (AI4QUOTE) integrated into the AIMI digital manufacturing platform
- True machining time from CNC/PLC events (cycle start/stop, program run, spindle on-time), with minimal sensor set only where machine signals are missing.
- ETL & data fusion layer (extract-transform-load) providing a single source of truth for AI and ERP/MES enrichment.
- ERP/MES interoperability with two reference connectors (e.g., SAP B1 + Helios/Byznys); other systems covered through API specifications.
- LCA-based sustainability module linking cost and eco-impact.
- Multi-country pilot validation (Slovakia – SK-medium + additional EU site[s]).

PROPOSAL INTRODUCTION (II)

Expected outcome:

Initial TRL: 4–5

Target TRL: Validated integrated prototype (TRL 7), ready for industrial deployment and replication in other SMART Cluster initiatives.

- TRL-7 integrated demonstrator combining Digital Twin and AI4QUOTE within AIMI, with two reference ERP/MES connectors and API specs for other systems.
- LCA-enabled eco-costing dashboards with quantified sustainability KPIs.
- Multi-country industrial pilots (Slovakia + additional EU site[s]) delivering measurable business performance gains and verified environmental impact reductions.

Impacts:

- Technological: Establishment of AIMI as a digital manufacturing intelligence platform integrating real and AI data.
- Business: Quotation time ↓ 50 %, accuracy ↑ 25 %, rework ↓ 20 %, planning efficiency ↑ 25 %.
- European: Strong cross-country collaboration (CEE + DE/ES/PL/PT/NL), alignment with EU AI Act.
- Sustainability: LCA-enabled costing reduces material and energy use.

Schedule: Duration: 36 months (Q3 2026 – Q3 2029) | Total Budget: €2,5M | Coordinator: DE/BE/AT/IT/NL

PARTNERS

Current Consortium: (confirmed)

MECASYS (SK) — industrial pilot, validation, exploitation; digital-twin data source.

PULSAR (CZ) — Digital Twin & AI4QUOTE development; ETL; ERP/MES integration; XAI & uncertainty.

Partner search (Western & Southern & Northern Europe focus)

Project Coordinator (RTO/Institute)

Role: overall coordination, AIMI integration, GDPR/AI Act compliance, interoperability leadership.

Data/Cloud Interoperability Partner — ERP/MES/PLM connectors, APIs, digital thread enablement.

AI Research Partner (University / AI Lab)

Role: explainable AI, model auditing & risk management, interoperability inputs.

Sustainability / LCA Partner *Role:* LCA methodology, eco-costing integration, sustainability KPIs & dashboards.

Industrial Validation Partner (End-user site)

Role: secondary pilot deployment, cross-site validation, transferability.

Indicative budget shares (to be finalised with Coordinator):

Coordinator 30% | PULSAR 24% | MECASYS 22.4% | Data/Cloud Interop 8% | LCA 6.8% | AI R&D 5.6%
Industrial Validation 3.2%."

CONTACT INFO

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