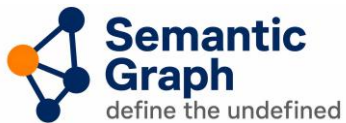


Industrial Knowledge AI Platform for Manufacturing Quality Intelligence

From Defect Detection to Explainable Process Intelligence

Quality Intelligence Platform
August 1, 2026
Seoul, Korea

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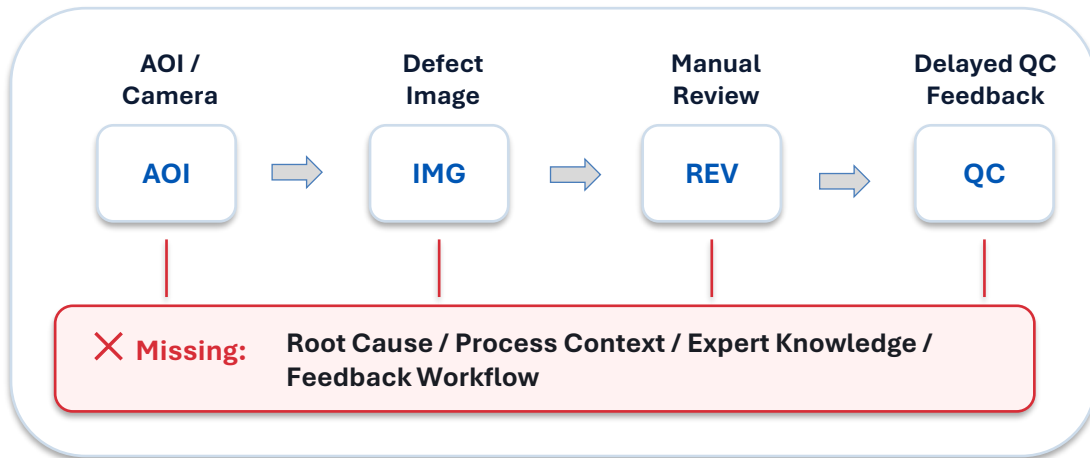
1. Problem

Manufacturing AI stops at detection — but factories need decisions

Manufacturing companies generate massive inspection data, but most of it remains disconnected from process parameters, equipment conditions, and expert knowledge

! Key Pain Points

- 1 AI vision systems detect defects, but rarely explain why they happen
- 2 Defect images are often stored separately from process and equipment data
- 3 Quality engineers still rely on manual review and fragmented feedback loops
- 4 Inspection data is not fully transformed into operational decision intelligence



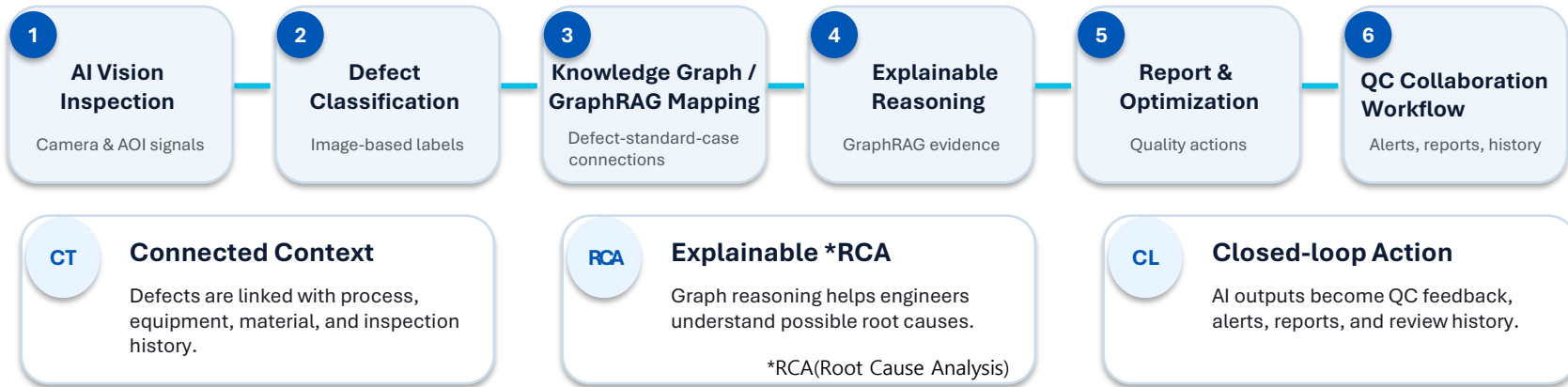
AI

Factories do not need more disconnected AI models
They need explainable process intelligence

2. Solution

Semantic Graph builds AI-ready enterprise knowledge

Semantic Graph connects enterprise documents, process data, business rules, and industrial knowledge into an ontology-based knowledge layer for AI agents and GraphRAG reasoning



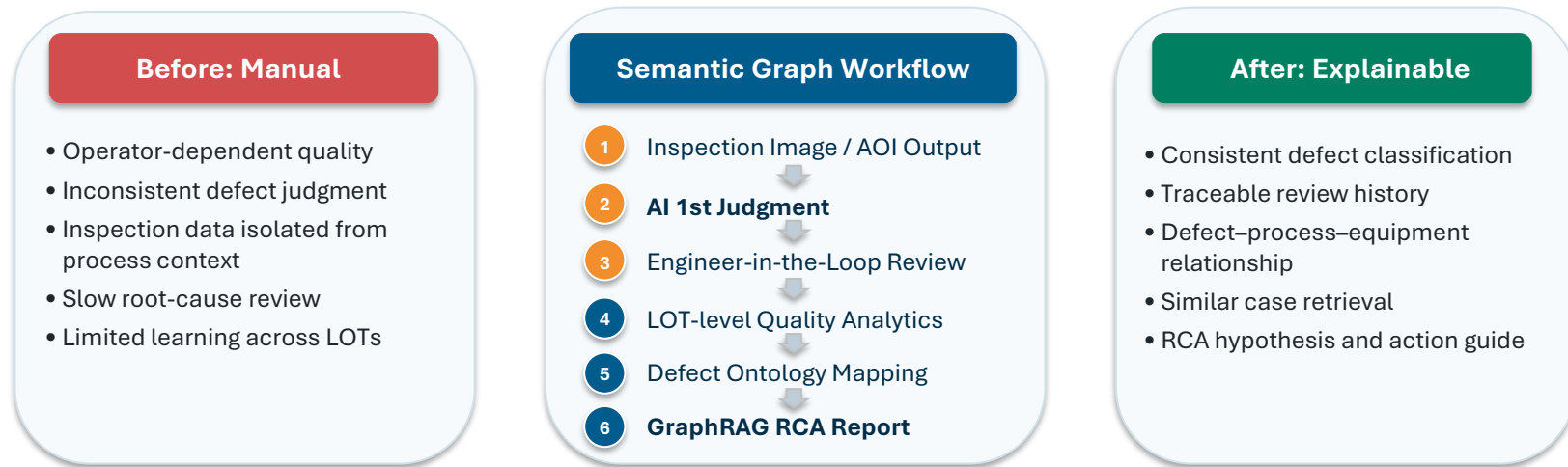
AI

From isolated defect images to connected manufacturing knowledge
AI should support decisions, not just detections

3. From Manual Inspection to Explainable Quality AI

AI first judgment, engineer review, LOT analytics, and GraphRAG-based RCA in one workflow

Semantic Graph turns isolated inspection outputs into traceable quality decisions for manufacturing engineers



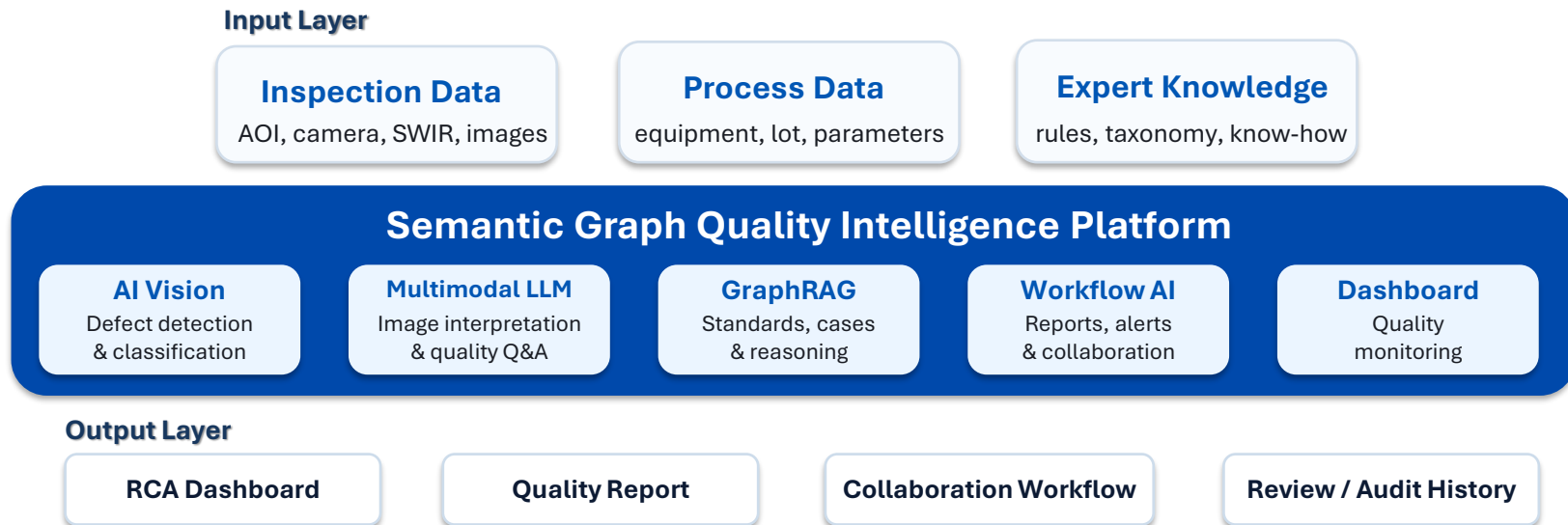
AI

Semantic Graph does not stop at defect detection. It connects visual defects, process context, engineering knowledge, and quality review workflows.

4. Product Platform

Semantic Graph Quality Intelligence Platform

A modular platform that connects AOI images, multimodal LLM interpretation, GraphRAG reasoning, and quality collaboration workflow

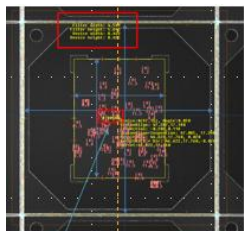


- **Key product idea:** make enterprise knowledge AI-ready by structuring domain concepts, rules, historical cases and workflows into a semantic layer

5. Technology Differentiation

Beyond AI Vision: knowledge-grounded manufacturing intelligence

Most AI vision systems focus on image-based detection. Semantic Graph connects defect results with process context, inspection standards, similar cases, and expert knowledge.



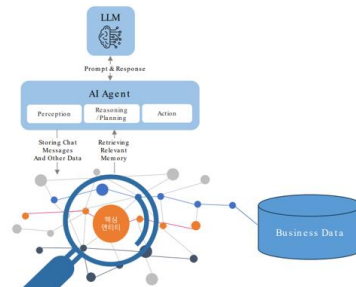
Generic AI Vision

Detects defects
Image-only model
Standalone AI output
Manual QC feedback
Black-box prediction

VS

Semantic Graph

Explains possible causes
Image + process + domain knowledge
Connected quality workflow
AI-assisted feedback loop
Traceable graph-based reasoning



◆ Key Differentiators

Knowledge Graph /
GraphRAG

Multimodal LLM

Workflow AI

Factory Integration

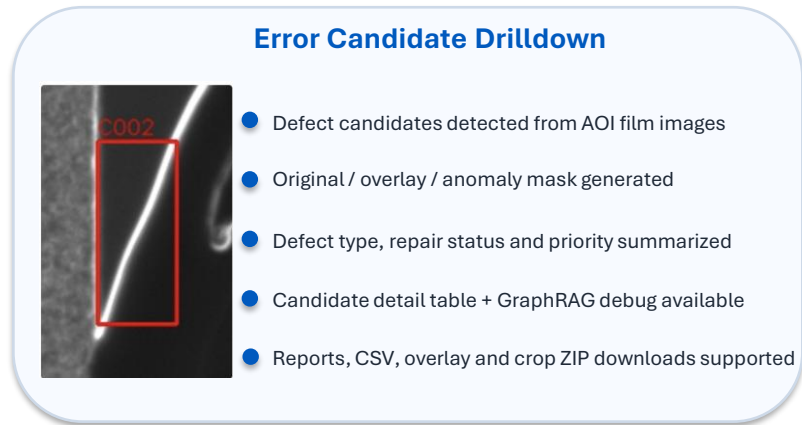
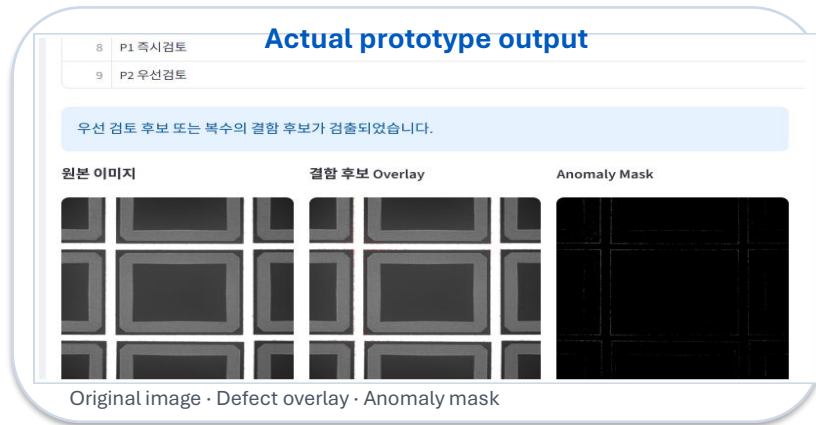
AI

Our differentiation is not just better detection
It is explainable decision support for manufacturing quality

6. Live Demo

AOI Defect Detection + GraphRAG Quality Reasoning

A working prototype that turns AOI film inspection images into defect summaries, repair judgment, GraphRAG evidence, and downloadable quality reports.



Workflow

Select
image

Check
Graph DB

Run
inspection

Review
evidence

Download

Demo link: 163.239.154.55:8504



Scan

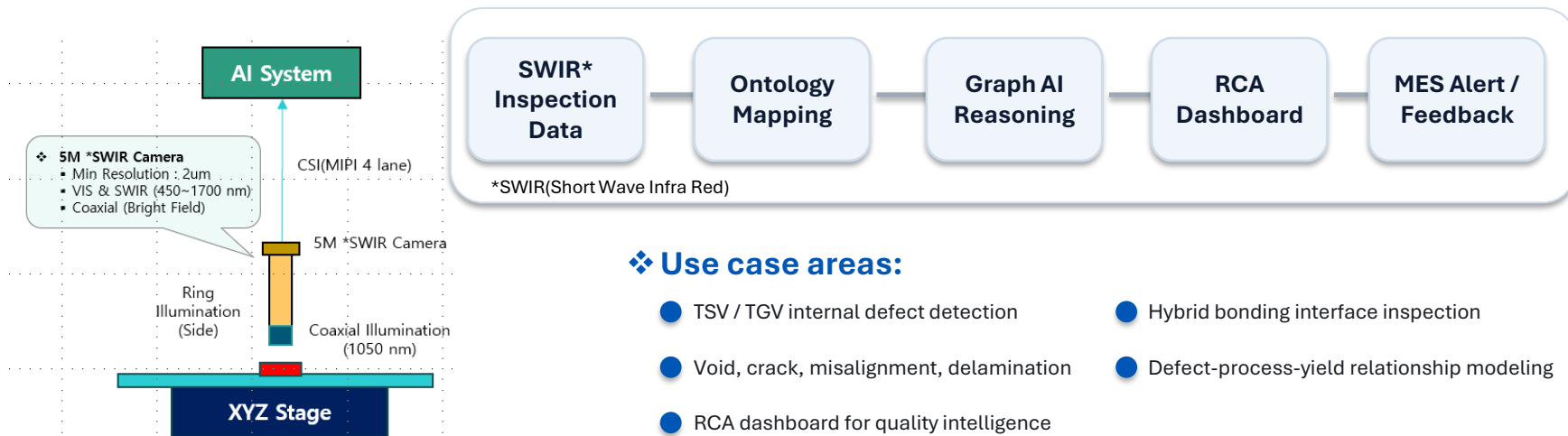
AI

From defect images to explainable quality decisions
GraphRAG turns inspection results into actionable quality intelligence

7. Use Case

Advanced Semiconductor Inspection with AOI + Graph AI

For advanced semiconductor manufacturing, invisible internal defects require non-destructive inspection and explainable root-cause analysis.



AI

We turn invisible defects into connected manufacturing knowledge
The goal is explainable semiconductor quality intelligence

8. Market Opportunity

Korean manufacturing ecosystems need trustworthy industrial AI

Manufacturing leaders need AI systems that support quality, reliability, traceability, and explainable decisions

Manufacturing strength

- Automotive, industrial components, semiconductors, batteries, machinery

Quality pressure

- Reliability, inspection consistency, and traceability

Trusted AI need

- Accountable decisions, not black-box predictions

Partnership fit

- Equipment makers, automation providers, industrial AI integrators

Physical AI Startup



Manufacturing Ecosystem



Industrial AI Market

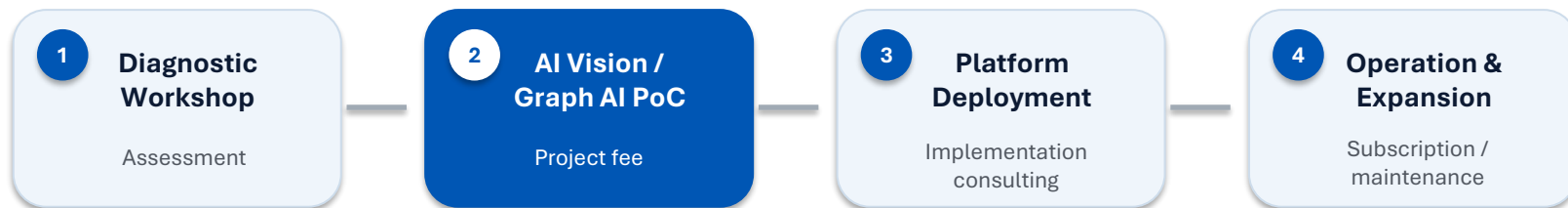
AI

Semantic Graph provides the right bridge to Korean manufacturing PoC partners
Quality, traceability, and explainable AI are the core requirements

9. Business Model & Go-to-Market

Repeatable PoC-to-deployment model for industrial customers

Industrial customers usually validate AI through focused PoCs before full-scale deployment



❖ Target customers

- Manufacturing quality teams
- Factory automation providers
- Industrial AI system integrators
- Process engineering teams
- Optical inspection equipment makers

AI

Expected PoC impact: 30–50% faster report preparation, 50%+ faster similar-case search
Partnership : nvidia Teaching Kits and Physical AI technology partnership

10. Team & Ask

Ready to bring Industrial Knowledge AI to global manufacturing ecosystems

Built by a team combining Graph AI, GraphRAG, manufacturing quality intelligence, optical inspection partnerships, and enterprise AX platform experience

Founder: Moonki Hwang

- AX Server Platform / Knowledge Graph / Industrial Ontology

➤ Contact

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Semantic Graph strengths

- Knowledge Graph, GraphRAG and Graph AI
- Multimodal LLM and workflow design
- Enterprise AX platform deployment

Current assets

- Working AOI film inspection demo with AI Vision + GraphRAG reasoning
- Manufacturing quality collaboration platform concept
- Advanced semiconductor SWIR AOI + Graph AI PoC concept

What we are looking for

- Global manufacturing PoC partners
- Inspection / automation partners
- 2026 Physical AI market leadership

AI

Semantic Graph helps manufacturers move from defect detection to explainable process intelligence.

Contact



Inquiry

For manufacturing quality AI implementation review, demos, and technology partnership inquiries

Semantic Graph

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