

Implement Physical AI and Agents for Factory Operations

Physical AI in factory operations improves throughput, resilience, and control by turning plan decisions into closed-loop execution

Manufacturers are under increasing pressure to drive higher output, adapt faster to disruption, and make better decisions across increasingly complex operations. While many have invested in data and analytics, a persistent gap remains between insight and action on the factory floor. By embedding AI directly into physical operations, manufacturers can move from episodic decision making to continuous, real-time execution.

Intelligent agents work alongside people and systems to sense, decide, and act across the plant, creating a more coordinated and responsive operation.



Improve plant reliability with physical AI that coordinates production flow in real time.

Frontier manufacturers are using agentic AI for:

Asset reliability and maintenance

Exception detection and response

Production flow optimization

Process optimization and yield improvement

Customer story

Rolls-Royce wanted to improve productivity and reduce costs across its design, build, and operate functions, as part of its digital transformation. In partnership with Microsoft, they created an AI-enabled digital thread across the product lifecycle, connecting engineering design, turbine inspection on the shop floor, and engine health monitoring.

With these digital advancements, the company accelerated fault resolution from days to near real time. It detects and prevents around 400 unplanned maintenance events annually, saving millions in repairs.

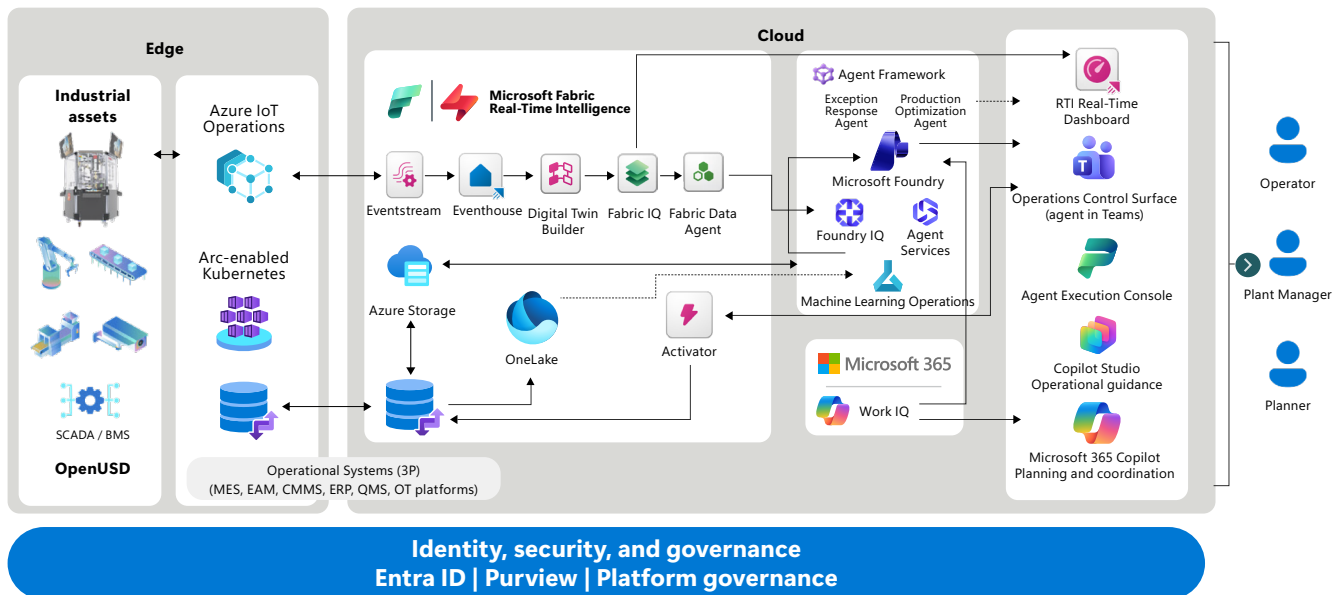


By embracing Microsoft AI and digital technologies, we will develop efficient and fully utilized smart factories.

Kaveh Pourteymour

Group Chief Digital Information Officer, Rolls-Royce

Reference architecture



Partners

Microsoft brings together a broad network of industrial partners, system integrators, and domain experts who connect AI with existing factory systems, helping accelerate deployment and deliver results across diverse production environments.



Reduce disruption and improve resilience through self-optimizing operations.

Next steps



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