Advanced process control, deployed in weeks — not years.

Most plants run hundreds of PID loops that hold one variable each but ignore interactions, constraints, and economics. Arta Kyb turns historian data and live OPC tags into closed-loop predictive control and real-time optimisation — deployed as a containerised platform that sits beside, not inside, the existing control system.

WHAT THE PLATFORM DOES

- **Connect (read-only).** Stream live & historical data over OPC-UA/DA, REST and cloud.
- **Model.** Linear, nonlinear, first-principles and data-driven — the right tool per unit.
- **Supervise.** MPC and adaptive PID on top of the regulatory layer — never replacing it.
- **Optimise.** Retarget controllers against cost, yield, energy and emissions.

WHY IT IS LOW-RISK

- **Beside the DCS.** No write access until you choose it; identity enforced at the API boundary (JWT).
- **Incremental.** Connect → shadow → close the loop → optimise, one bounded step at a time.
- **Reversible.** Containerised end to end; validated in test identical to production, rolled back instantly.

PLATFORM AT A GLANCE

Connectivity	Modeling	Control	Optimization
OPC-UA/DA, REST, cloud	Linear, nonlinear, first-principles, ML	MPC, adaptive PID, ESC, fuzzy	Steady-state & dynamic + history

DEPLOYMENT — INCREMENTAL & REVERSIBLE

1 Connect	2 Model & shadow	3 Close the loop	4 Optimise
Read-only data in	Advisory mode	Bounded write-back	Economic targets

Reference use case — pump cavitation digital twin. A live P&ID-driven twin for an ozonation plant estimates each pump's NPSH margin and cavitation state from available measurements. The same chain — connectors, models, closed loop — generalises to compressor surge, exchanger fouling and energy optimisation.

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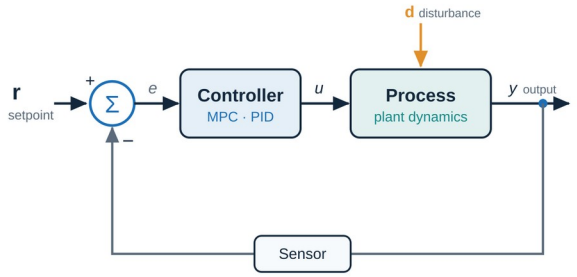
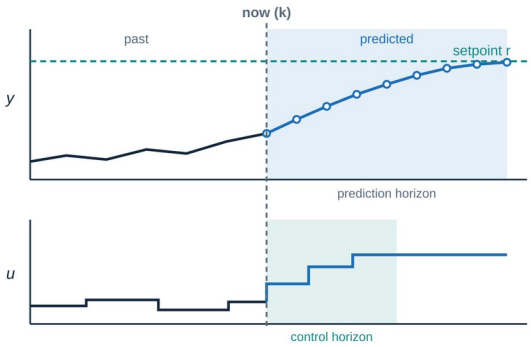
CONTROL, DIGITAL TWIN, AI & AGENTS

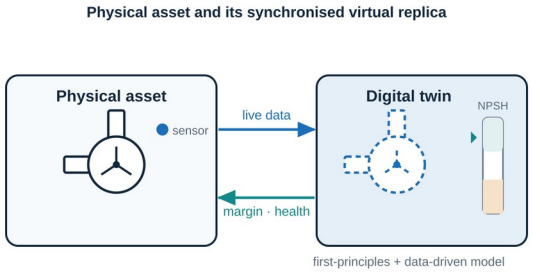
From classical feedback to learning models and autonomous agents — the platform's core, visually.



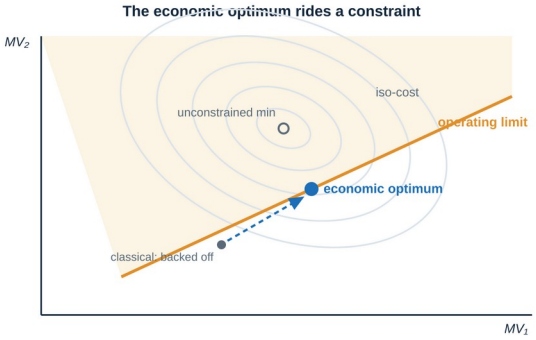
Closed-loop feedback — the controller supervises the regulatory PID layer, never replacing it.



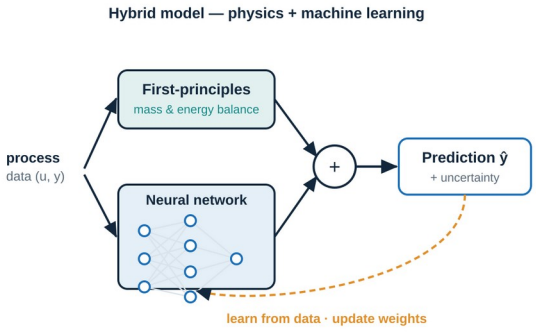
Model-predictive control — optimise over a horizon, apply the first move, then re-plan.



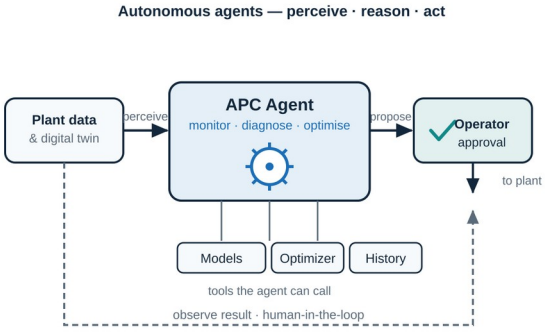
Digital twin — a synchronised virtual replica estimates NPSH margin and asset health live.



Real-time optimisation — the economic optimum sits on a constraint; classical control backs off.



Hybrid AI — first-principles physics fused with machine learning, improving as data arrives.



Autonomous agents — perceive, reason with tools, and act, with the operator in the loop.

Connect · model · supervise · optimise · learn — one platform, deployed beside the control system and reversible at every step.

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