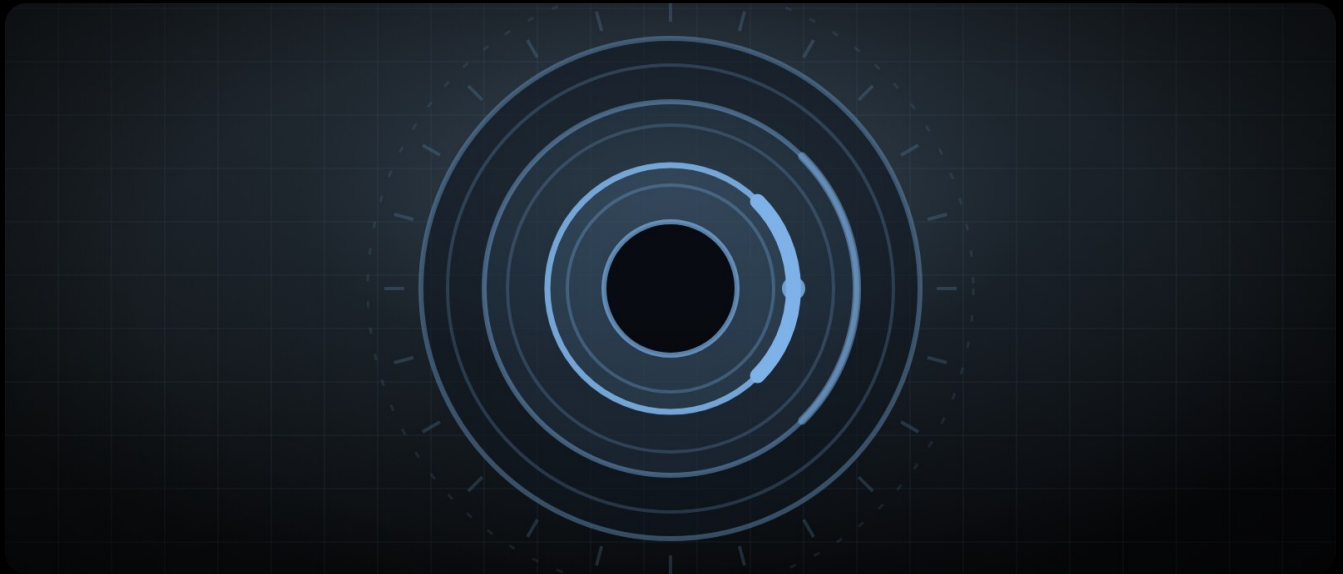




ENERGY · PRODUCTION & ASSETS

Casing Degradation Prediction for Well Integrity

An oil producer used Quantum One to decide which wells really need a workover — 33% fewer unnecessary interventions.

IMPACT

33%

Reduction in unnecessary workovers caused by risk overestimation in the baseline approach

Wells flagged before failure, not after**Degradation drivers explained per well**

CLIENT PROFILE

CLIENT

An oil producer

COMPANY TYPE

Oil and gas operator

INDUSTRY

Energy

SCENARIO

Production & assets

CHALLENGES

- Casing degradation is a critical concern in well integrity management; unplanned failures result in significant downtime, costly workovers and safety risks.
- Casing integrity is critical to structural integrity and zonal isolation, yet it is rarely monitored at sufficient frequency.
- Degradation is multi-factor — corrosion, mechanical stress and downhole chemistry — while the baseline approach focuses mainly on metal loss and treats well age as the primary risk driver.

APPROACH

Degradation logs, production streams, pressure build-up measurements and fluid chemistry are combined into aligned time-series and static features, enriched with domain-driven indicators.

An ML ensemble flags the wells with a high probability of casing degradation, and feature importance and sensitivity analysis translate the model's signals into actionable hypotheses about what is driving it.

BENEFITS

- Data collection and preprocessing across logs, production, pressure and chemistry
- ML ensemble flagging wells at high probability of degradation
- Model parameters tuned for predictive performance
- Degradation drivers explained through feature importance and sensitivity analysis

TIME TO PRODUCTION

Stage	Quantum One	Typical process	
Problem definition	1 week	2–3 weeks	
Proof of concept	2–3 weeks	4–6 weeks	
MVP	4–6 weeks	8–12 weeks	
Scale-up	1–2 months	3–4 months	
Maintenance	Ongoing	—	

TAKE THE NEXT STEP

Speak with our experts to discuss tailored AI solutions for your industry

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