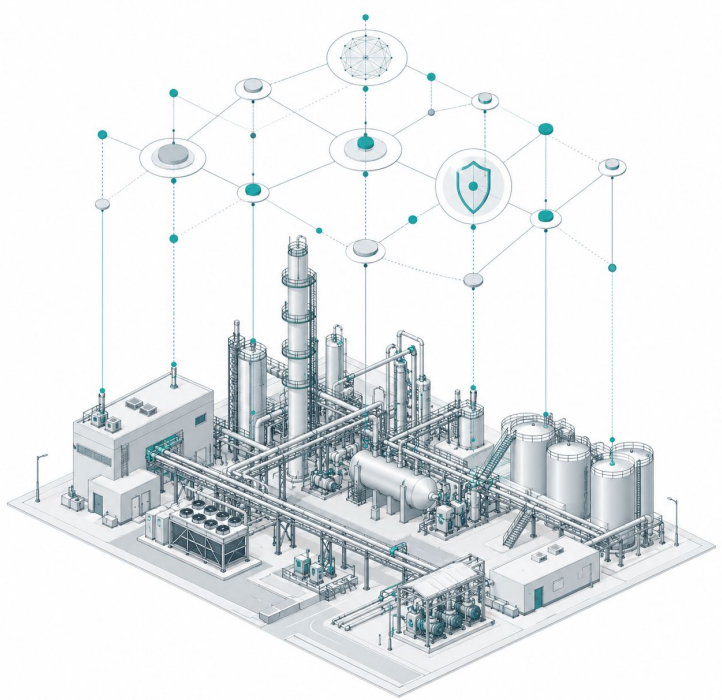
Ontology-grounded causal world models unlock reliable AI for zero-fault-tolerant missions



Xia Xuan

ZenSmart Technology (Beijing) Co., Ltd.

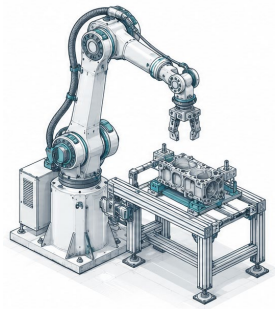
Critical decisions carry real consequences

Errors can affect people, assets and service continuity.



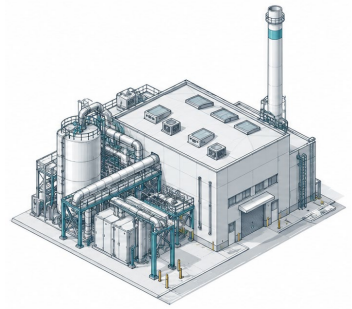
People

A wrong recommendation can expose workers to harm.



Equipment

Incorrect settings can damage critical assets.



Services

Incorrect decisions can disrupt essential services.

Reliability is a condition for adoption.

Reliable decisions need evidence



Reliability

Fits the process and stays within operating limits.



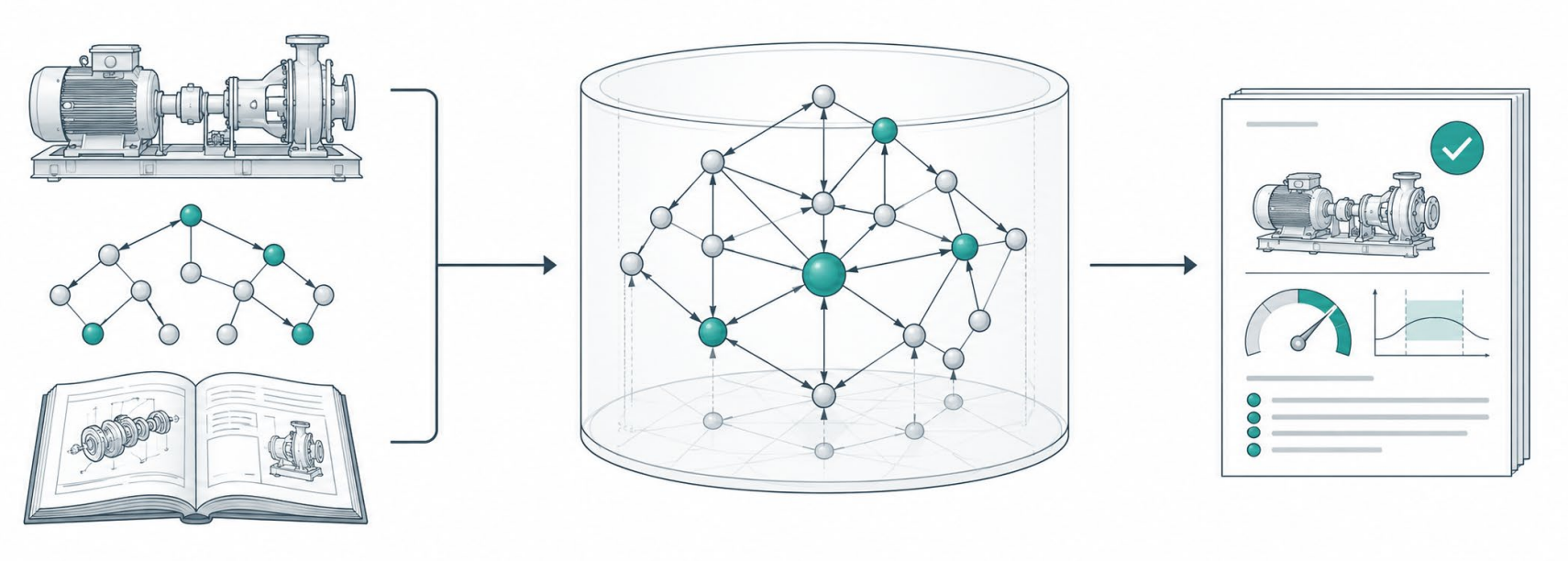
Verifiable reasoning

Shows the evidence and reasoning engineers need to check.

Engineers need to understand and verify recommendations before acting.

Physical knowledge constrains AI reasoning

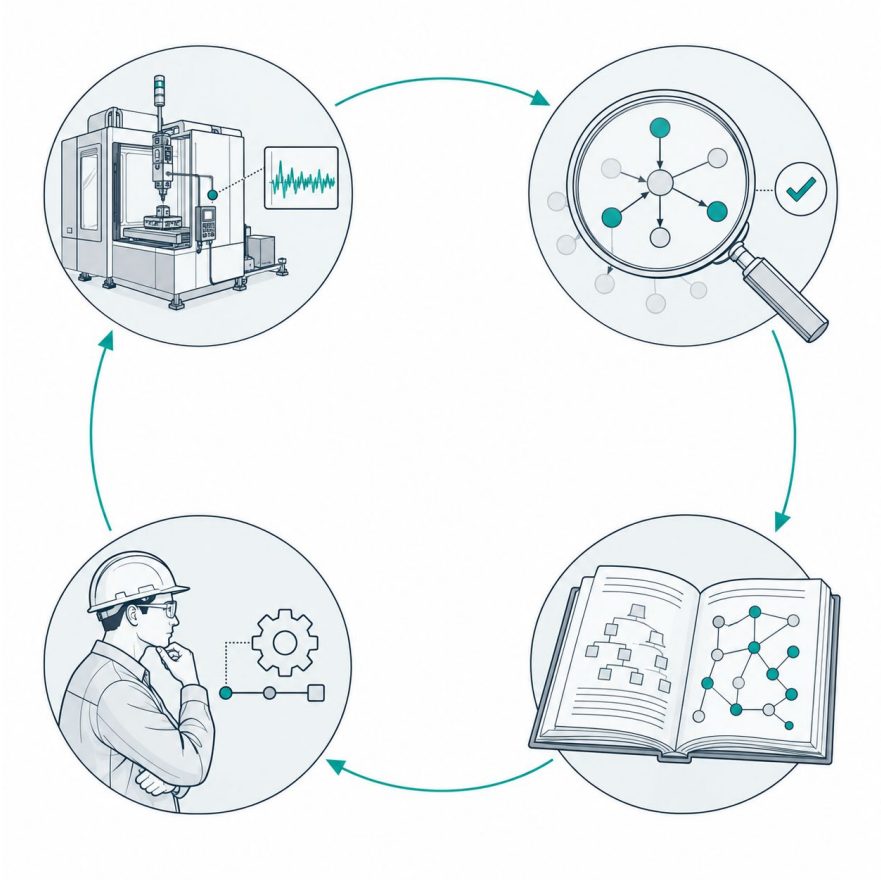
Domain knowledge | **Causal world model** | **Recommendations**



Physical laws, process rules, equipment limits and standards

A dynamic ontology defines the boundaries for reasoning about changes and outcomes.

Operating experience becomes reusable knowledge



Operating data

Observe conditions and outcomes.

Causal validation

Test relationships against physical knowledge.

Ontology update

Add findings only after validation.

Practical reuse

Share proven knowledge across teams.

Expertise becomes an organizational asset.

Assessing the value of AI



Safer operations

Earlier warnings.
Fewer false alarms.



Faster work

Less time diagnosing problems.
Lower costs.



Reusable expertise

Faster learning. More use of proven knowledge.

Define success. Compare a small pilot with current practice.

Include review and operating costs.

Thank you

Xia Xuan

ZenSmart Technology (Beijing) Co., Ltd.