



The 23rd International Asset Facility and Maintenance Management Conference

From Reactive Chaos to Predictive Power – Building the Maintenance Intelligence Layer

Eng. Kingkof Kofi Opoku-Ohemeng FIAM FCIHT CENG MCIQB AMP CMA2 CFM
Global Asset Management Leader



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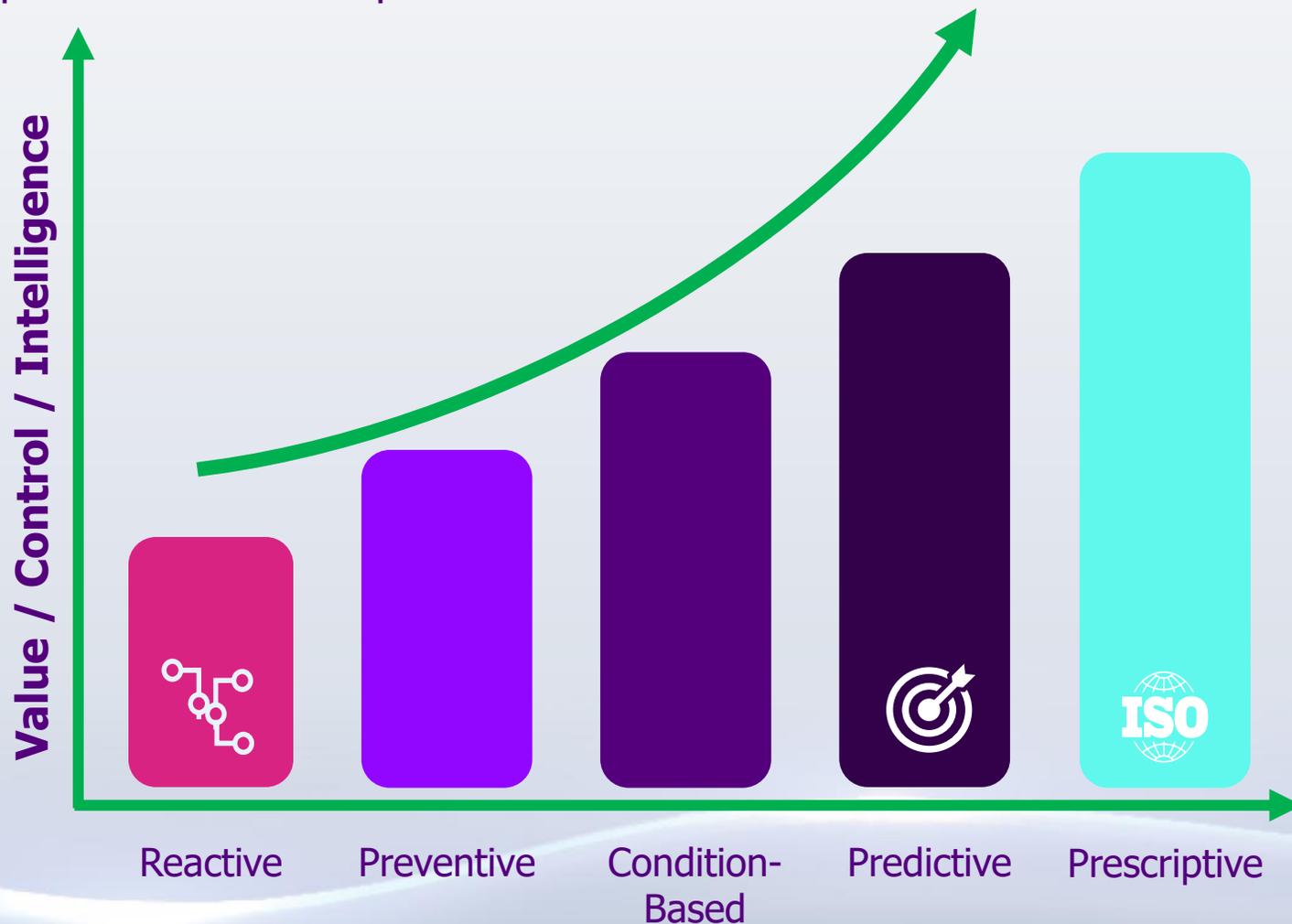
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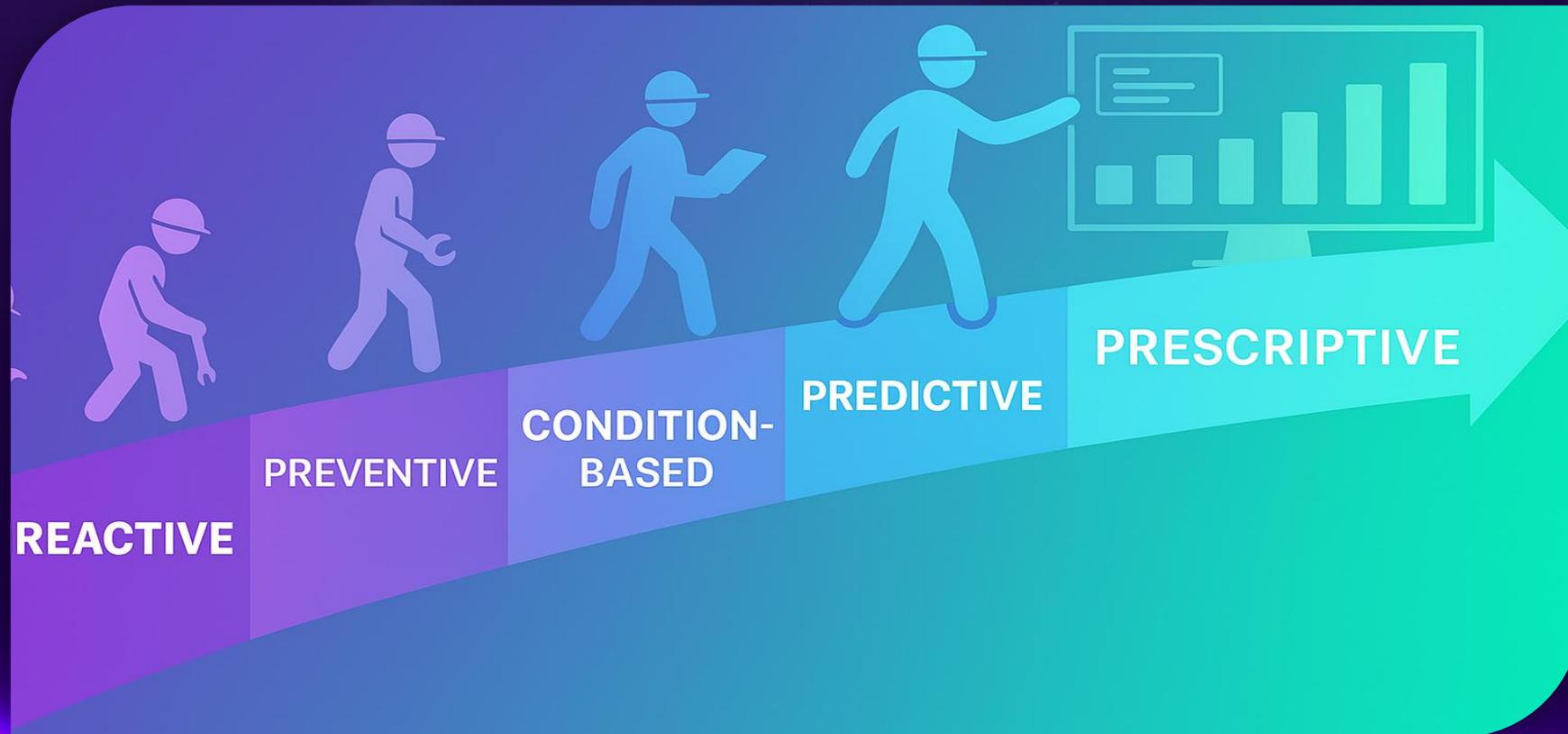
The Reactive Maintenance Trap

- ❑ 60-80% of maintenance cost = reactive work
- ❑ Average downtime per failure: 5 - 10x planned maintenance cost



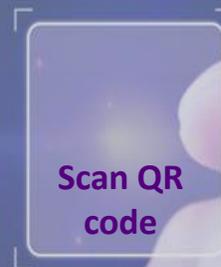
The Journey to Predictive Power

- Five levels of maturity with short labels.



INTERACTIVE POLL: Maintenance Maturity Self-Check

- Rate your organization's maintenance maturity (1 – 5)



Maintenance Maturity Model Explained:

From Reactive to Prescriptive - Understanding the 5 Stages of Maintenance Evolution

1		REACTIVE Firefighting Mode	Mindset: Fix it when it breaks. Key Characteristics: No formal maintenance planning or asset strategy. Heavy dependence on manual inspections and emergency repairs.
2		PREVENTIVE Calendar-Based Maintenance	Mindset: Do it regularly to prevent failure Key Characteristics: Scheduled maintenance(or usage based) Reduced unplanned downtime, but still inefficient
3		CONDITION-BASED Sensor Assisted Awareness	Mindset: Monitor health and act when parameters change. Key Characteristics: Use of sensors (temperature, vibration, pressure) to detect early warning signs. Operators begin using dashboards for performance visualization
4		PREDICTIVE Data-Driven Forecasting	Mindset: predict failure before it occurs Key Characteristics: Integration of IoT and analytics platforms for failure prediction. Maintenance activities optimized to minimize cost and downtime.
5		PRESCRIPTIVE Autonomous Optimization	Mindset: Automate decisions and continuously improve. Key Characteristics: Closed-loop systems automatically recommending or initiating maintenance actions. Full integration of digital twin and enterprise systems (EAM, SCADA, ERP). Focus on asset performance, sustainability, and continuous optimization.

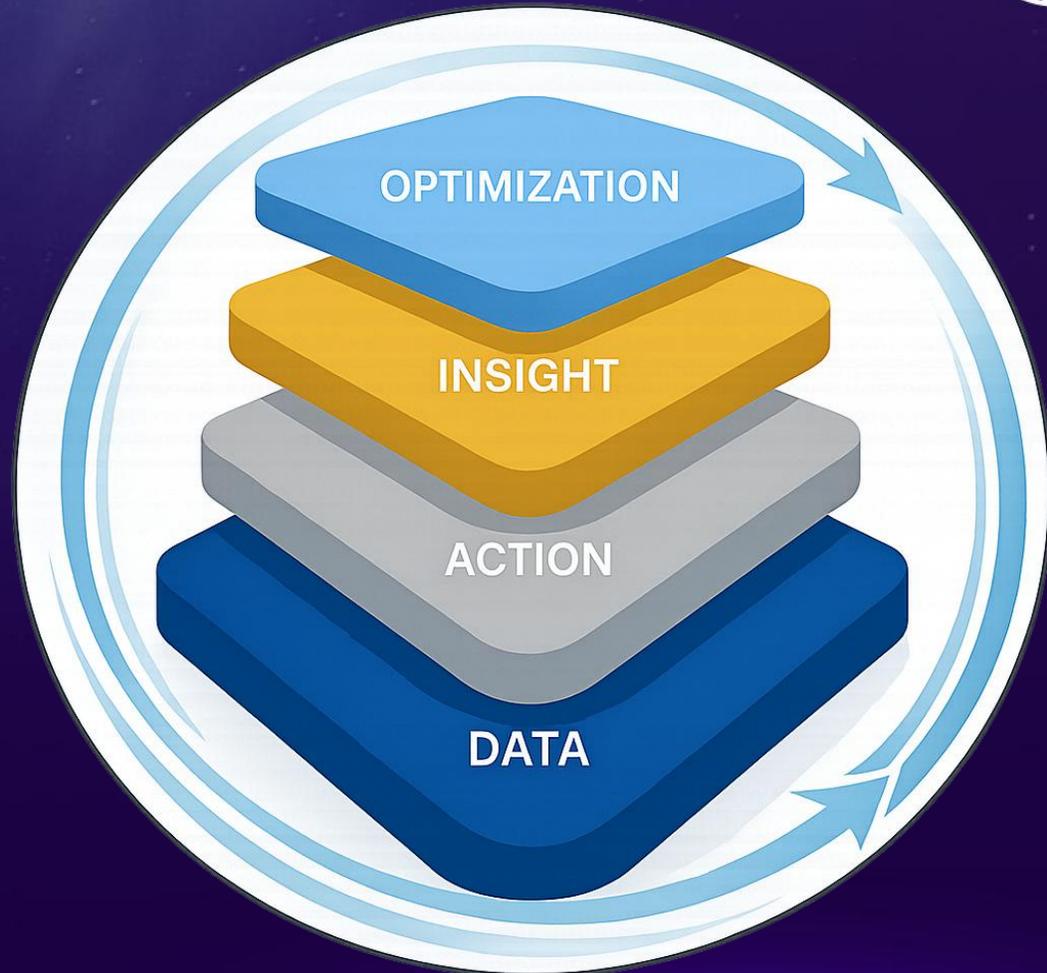
Why the Change Now?

- ❑ IoT + Connectivity = **Insight**
- ❑ Insight + Governance = **Power**
- ❑ Data must connect across people, process, and systems.



The Maintenance Intelligence Layer

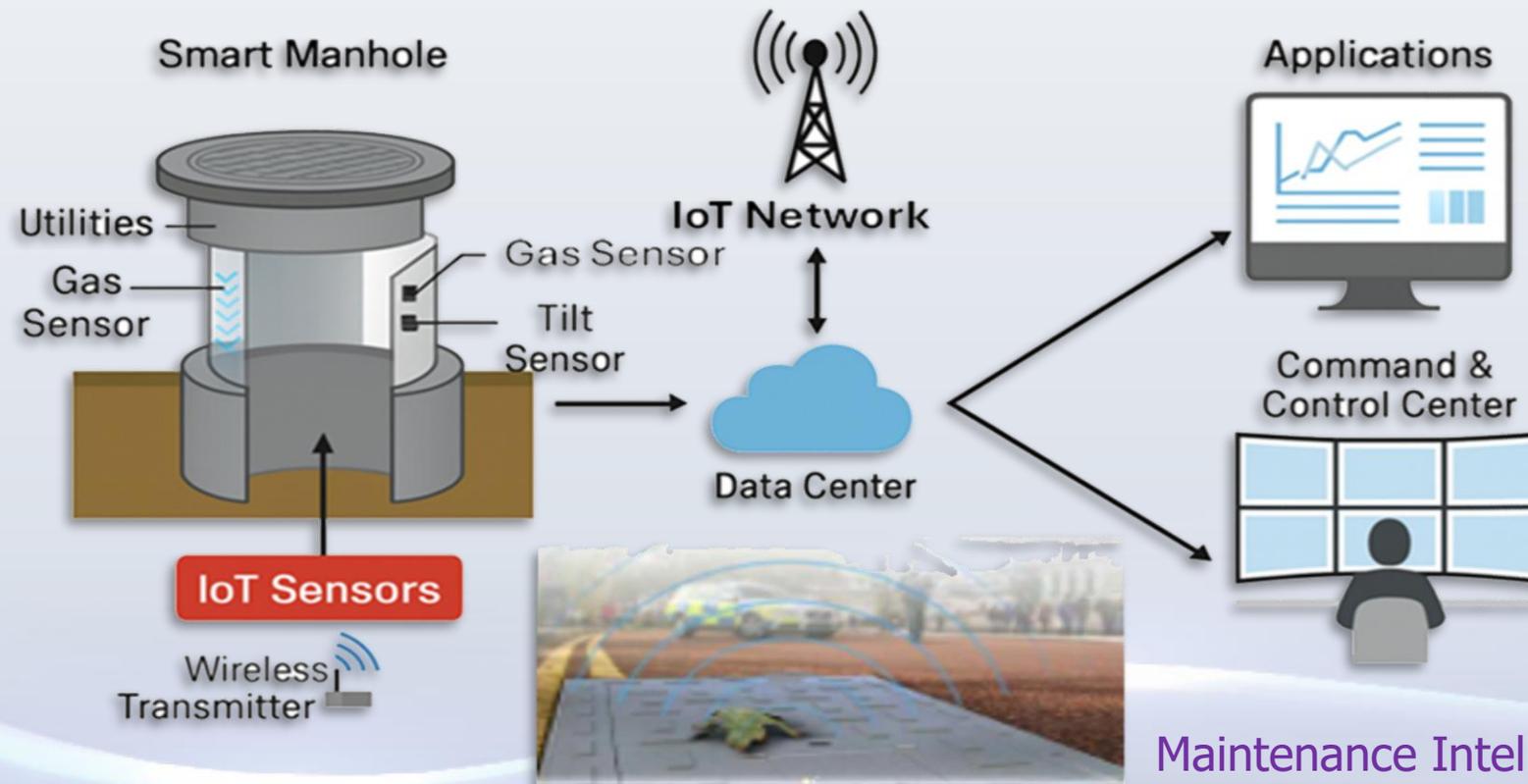
- ❑ **Optimization** → capture from assets
- ❑ **Insight** → analyze patterns and anomalies
- ❑ **Action** → plan and execute interventions
- ❑ **Data** → learn, refine and improve outcomes



Continuous Learning Loop

Use Case 1: SMART MANHOLES

- ❑ IoT sensors continuously monitor gas, flooding, and structural tilt.
- ❑ Real-time alerts routed to the Integrated Operations Center (IOC).
- ❑ Early intervention → improved safety, reduced downtime, lower costs



Maintenance Intelligence Layer

INTERACTIVE POLL: Smart Manhole Priorities

Which parameter would you monitor first in your city's smart infrastructure (e.g., Smart Manhole)?

Choose the ONE parameter that represents your biggest risk today



- Gas Levels
- Flooding
- Tilt
- Temperature
- Sensors

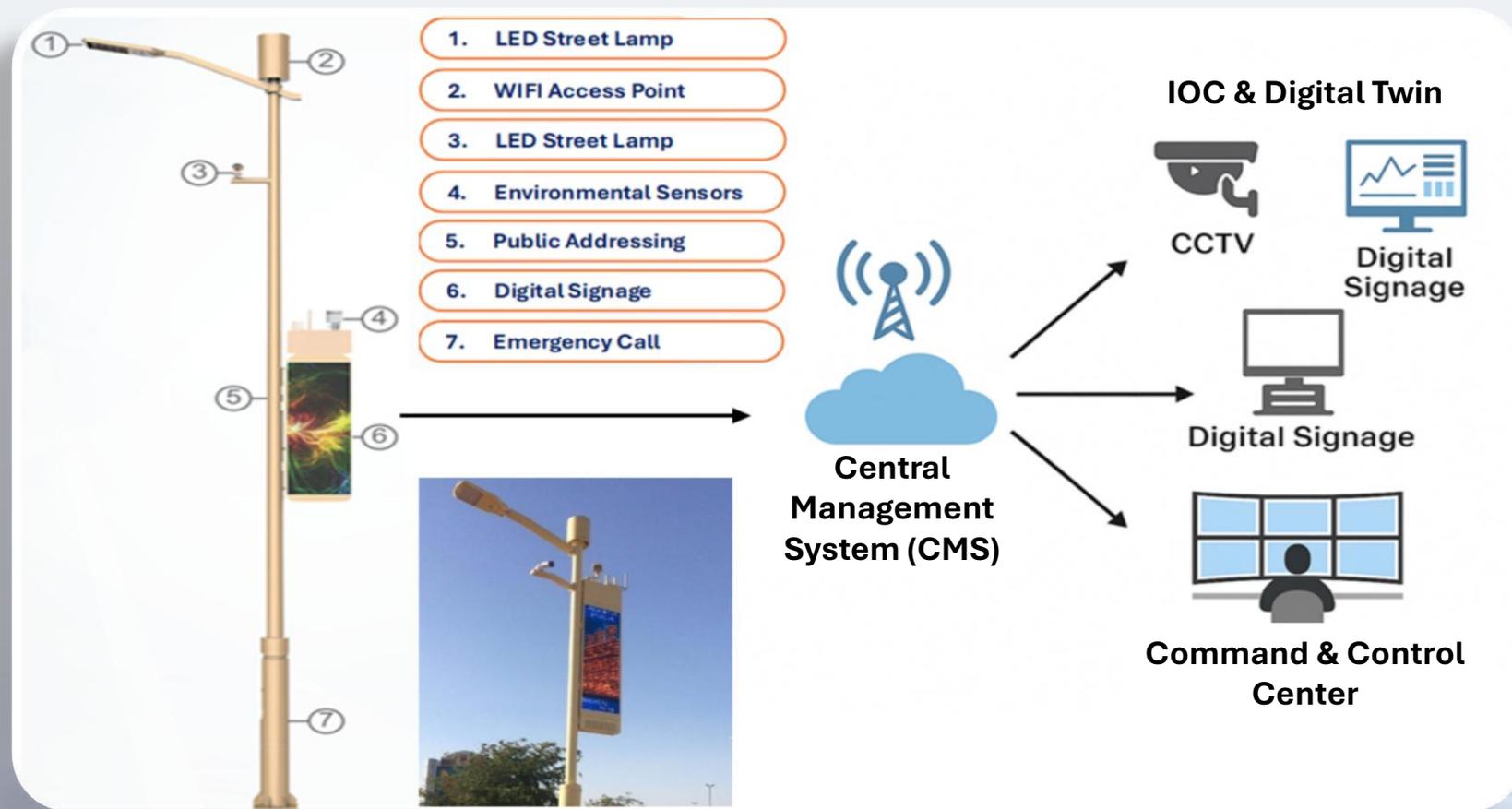


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Case Study 2: SMART POLES

- ❑ Multi-service poles: lighting, sensors, CCTV, 5G.
- ❑ Predictive fault detection.
- ❑ Energy optimization.

From asset → platform → service



INTERACTIVE POLL: Smart Pole Priorities

Which Smart Pole capability delivers the greatest operational value today?

Think safety, efficiency, cost, or resilience.



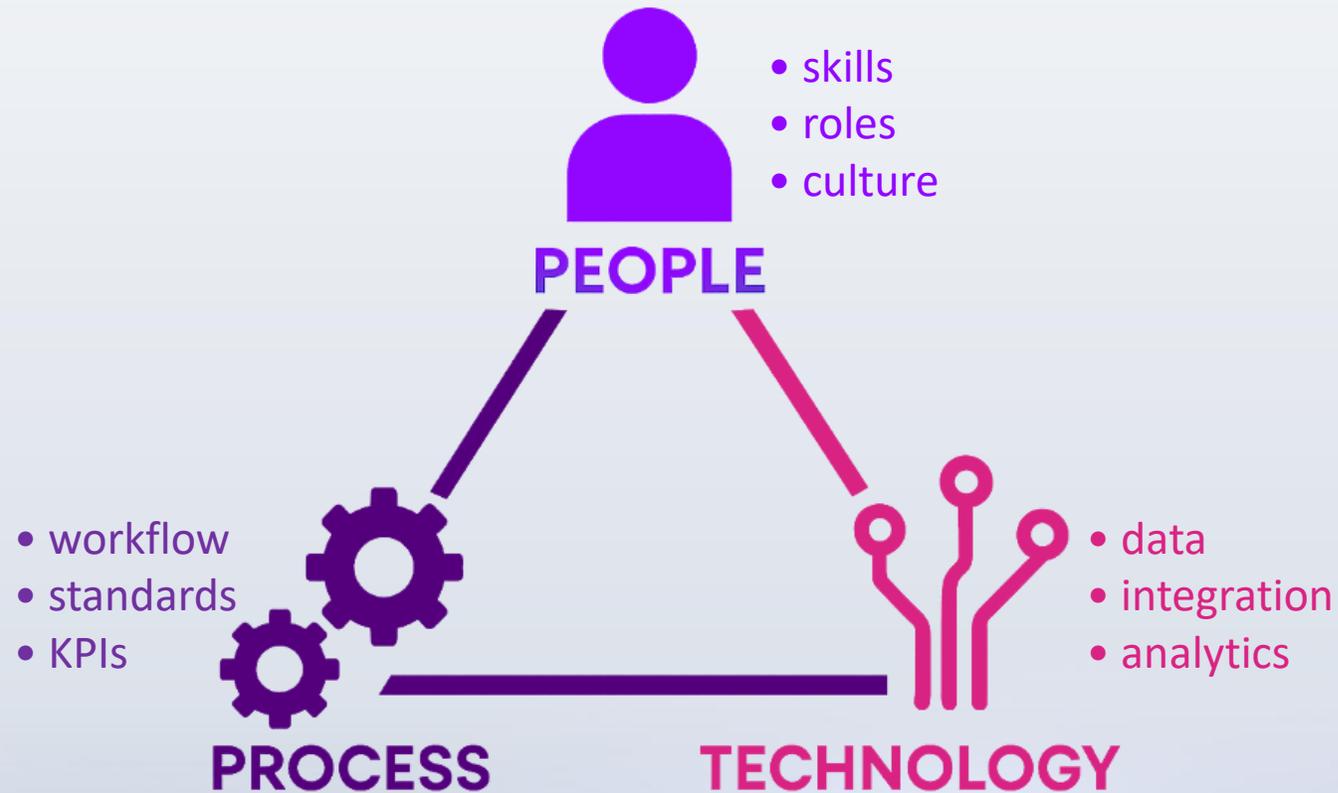
- Lighting
- Communication
- Sensors
- EV Charging
- CCTV



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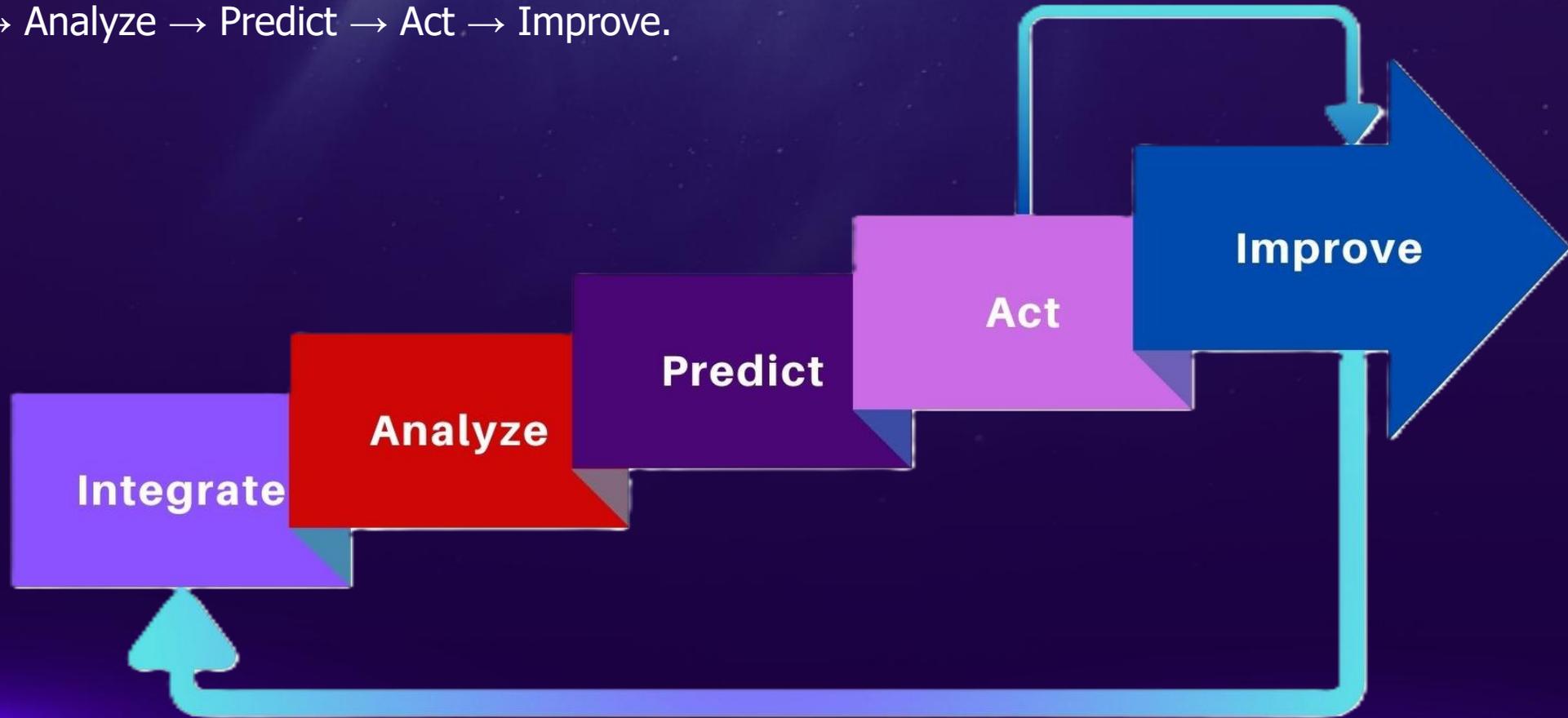
From Technology to Operational Excellence

□ Predictive succeeds when **People + Process + Technology** align



Building the Maintenance Intelligence Layer

□ Integrate → Analyze → Predict → Act → Improve.



A closed-loop maintenance intelligence cycle

Operational Readiness REFLECTION



If you could automate ONE maintenance task tomorrow, which manual step would you remove first?



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Operational Readiness REFLECTION



If you could automate ONE maintenance task tomorrow, which manual step would you remove first?



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What Actually Enables Predictive Maintenance

❑ Interoperability | Security | Governance.



Common Barriers and the Practical Way Through Them

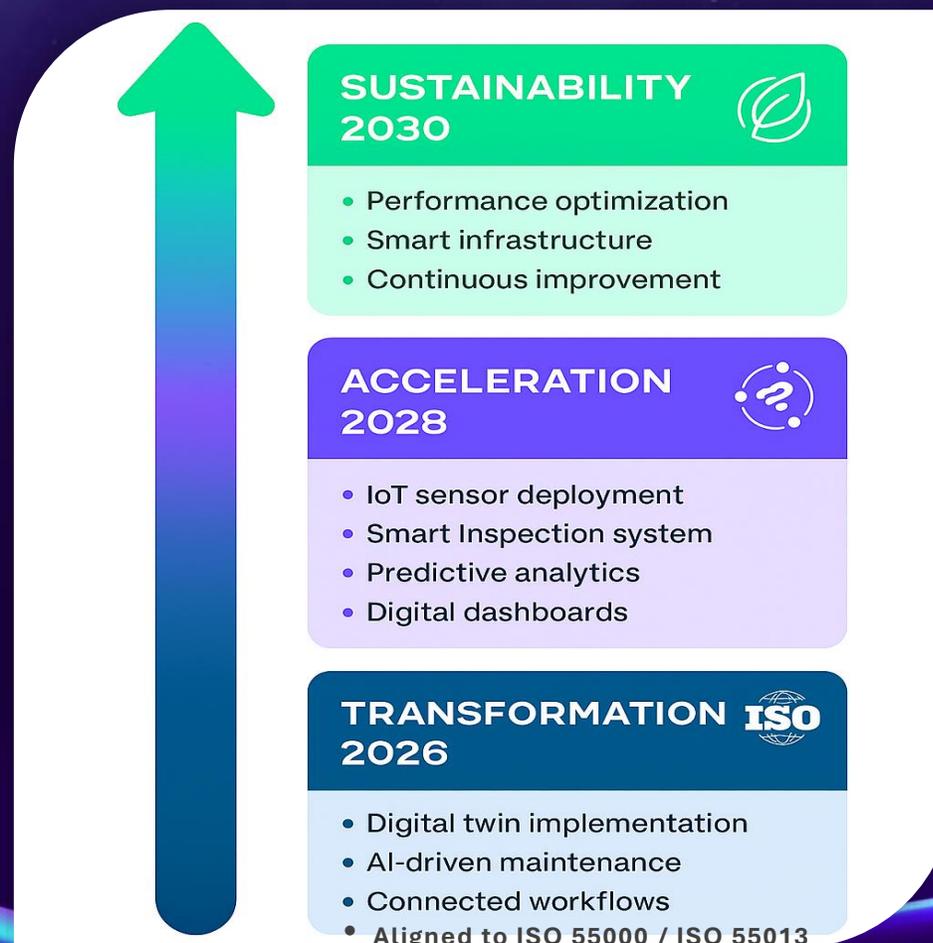
- ❑ Barriers → Responses → Impacts
- ❑ Data Silos | Skills Gap | Limited Budgets.

Barrier		Response	Impact
	Data silos	Integration & APIs	Single source of truth
	Skills gap	Training & culture	Upskilled, more informed workforce
	Limited budgets	Quick wins & ROI proof	Demonstrable business value

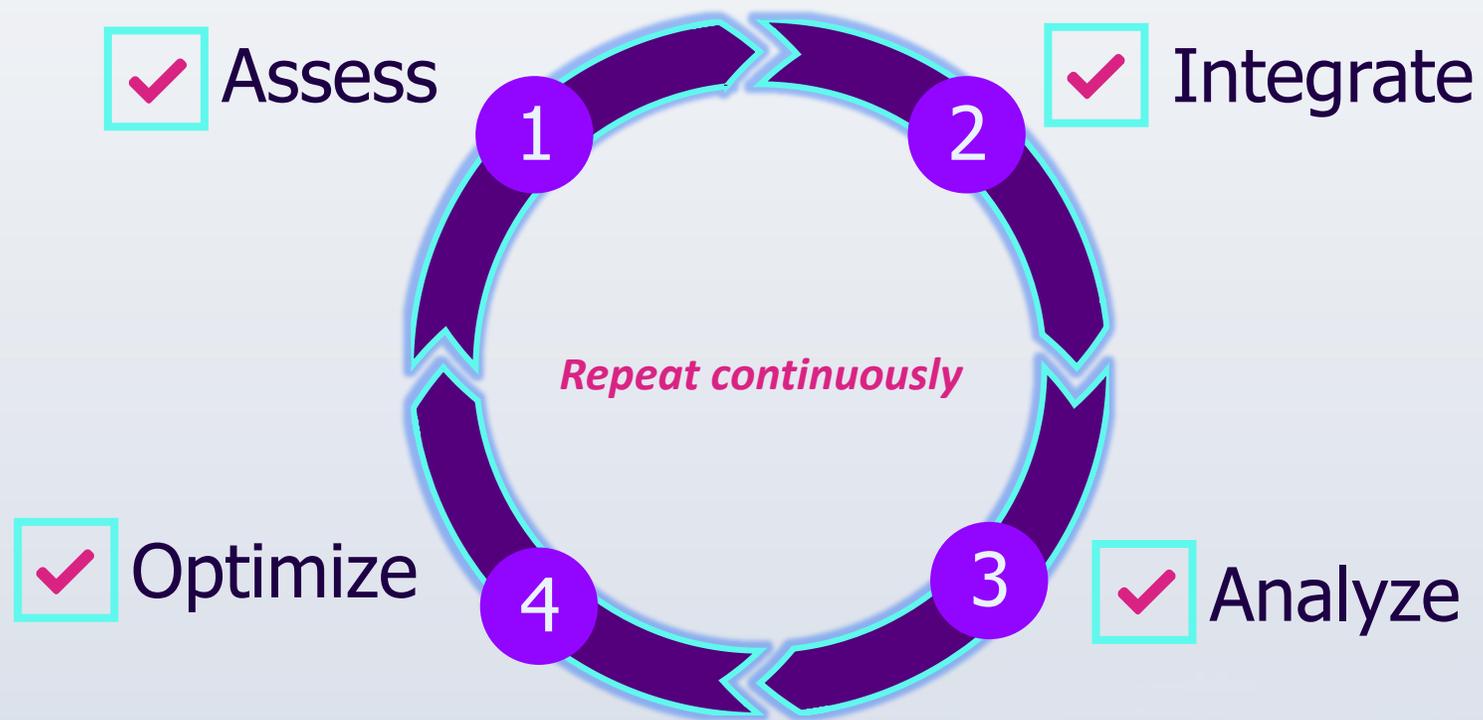
Lessons from RC Yanbu & Beyond

- Governance before Gadgets | Start small, scale fast | Build Skills with Systems.

RC Yanbu's Digital Maintenance Roadmap



Your Predictive Roadmap



In Conclusion

Move from
Data Collection to
Data Connection.





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THANK YOU!



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