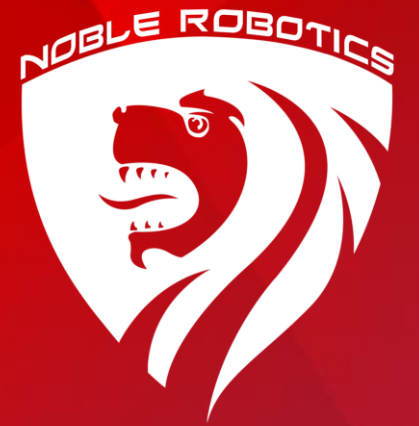




NOBLE
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Today

Value Proposition (Smart Manufacturing)

What we are doing

What we expect from current initiatives

Value Proposition 4.0

“It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.”

— Arthur Conan Doyle, Sherlock Holmes

4.0





What's going on?

Where do I go?

What can I expect?

IOT: Challenges

NOT FOCUSED ON BUSINESS OUTCOMES

- Priority misplaced on devices and connectivity, not business processes; Clear ROI not articulated

PROJECTS STALL AND FAIL

- Complexity due to several moving parts
- IoT data not being converted into business insights

LACKS ENTERPRISE CONTEXT

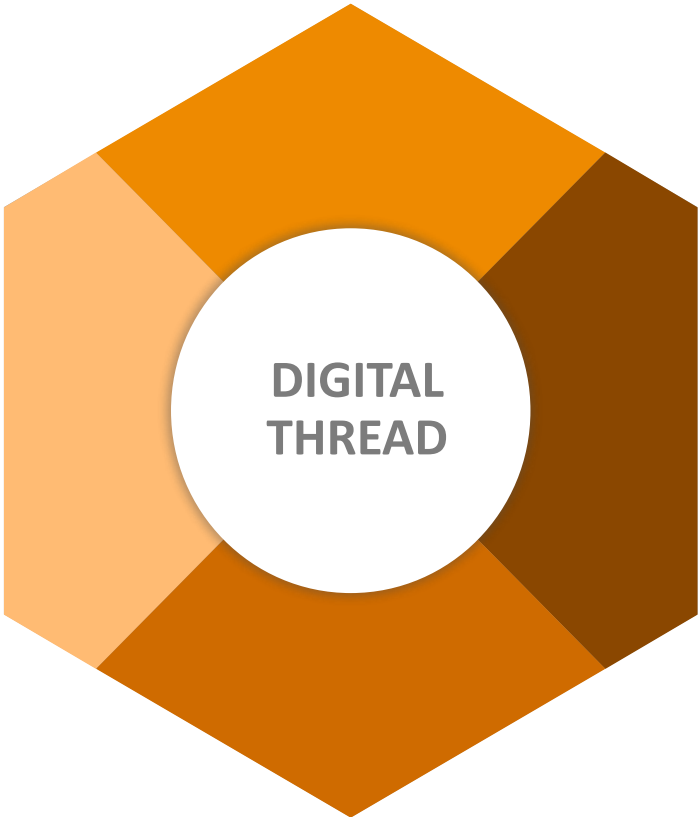
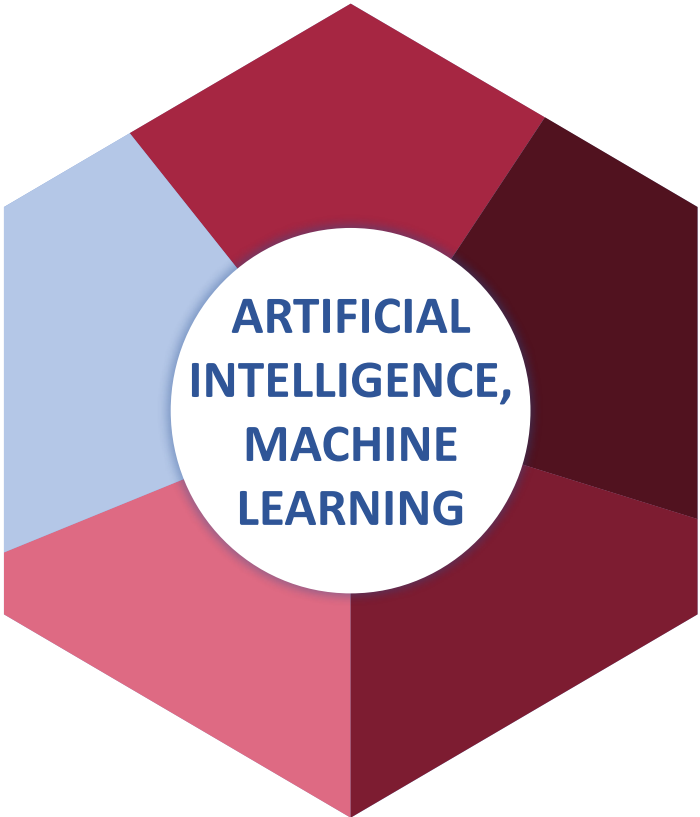
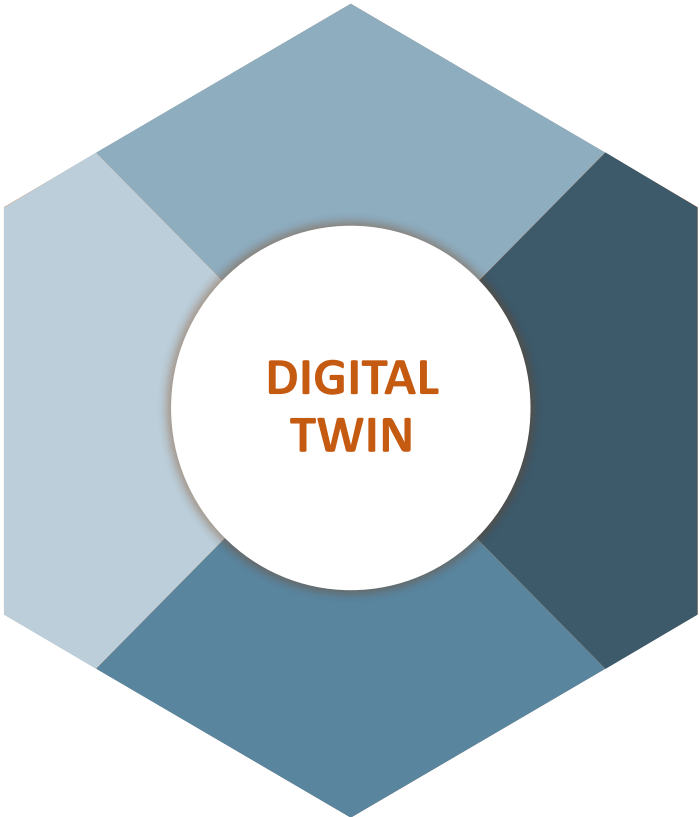
- Not integrated with Supply Chain, Transportation, and ERP processes



Value Proposition 3.0

Waste Reduction
Utility Improvement
Customer Experience

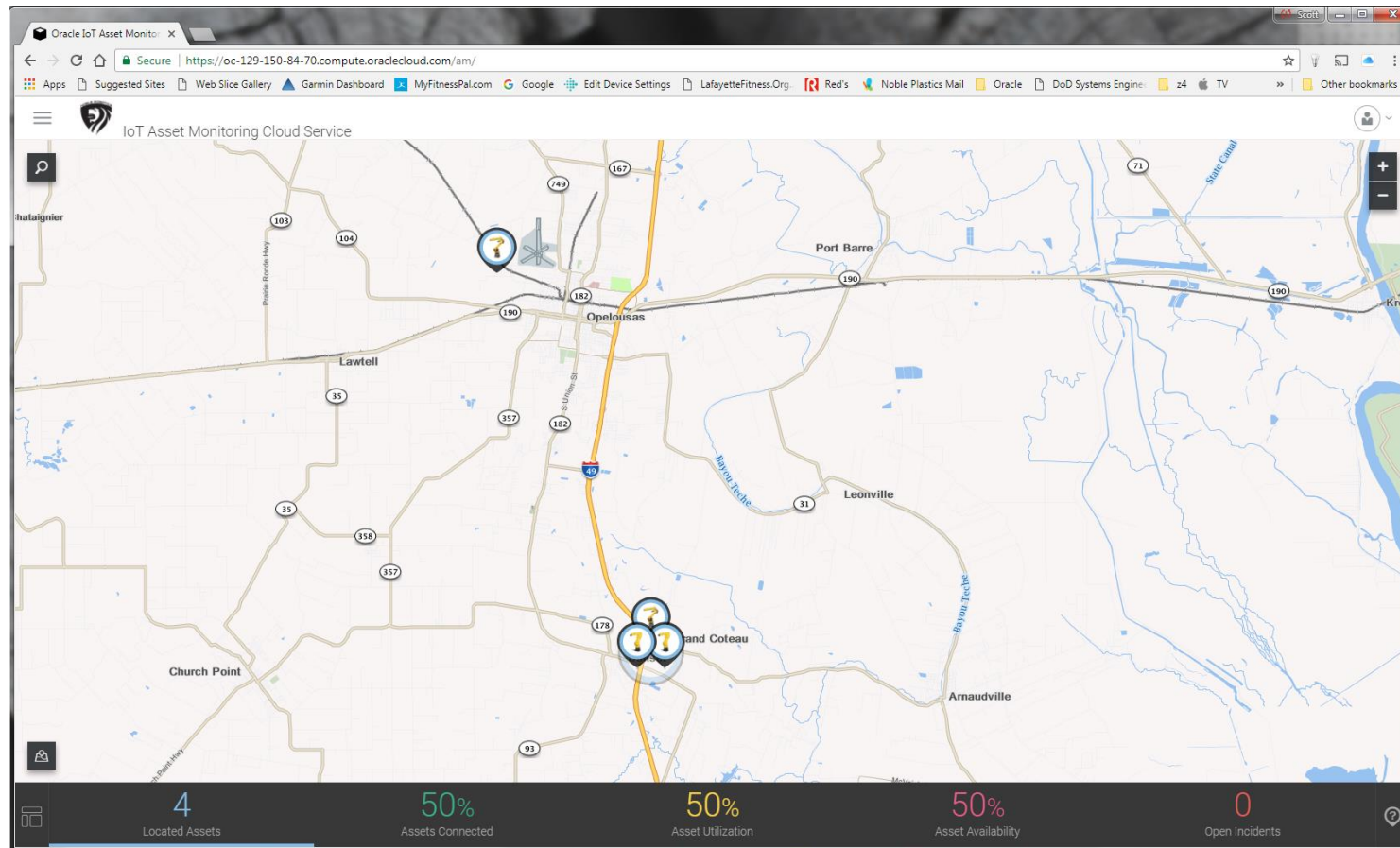
Tools



Establishing the system



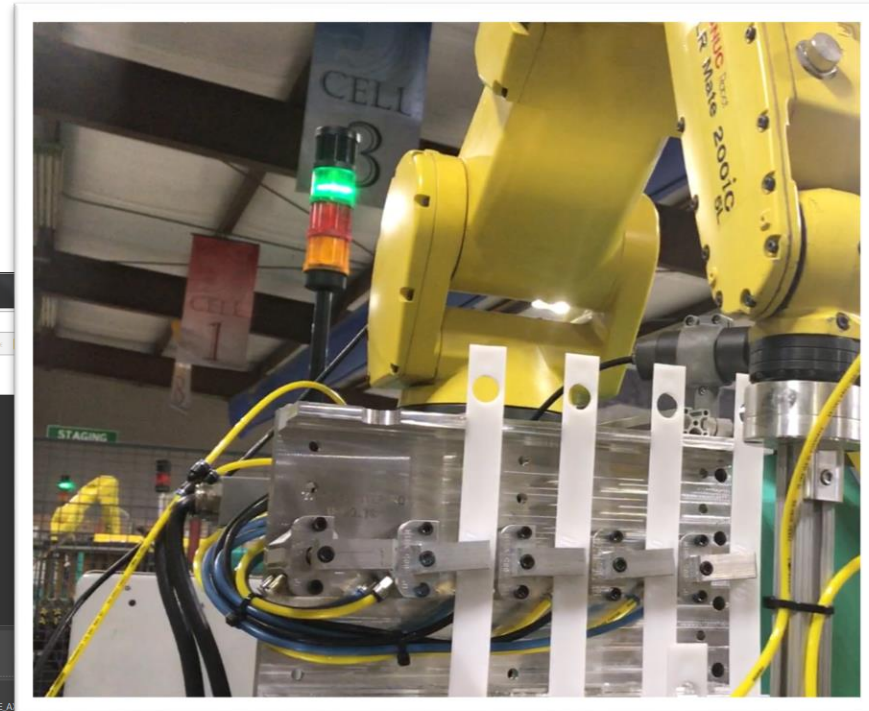
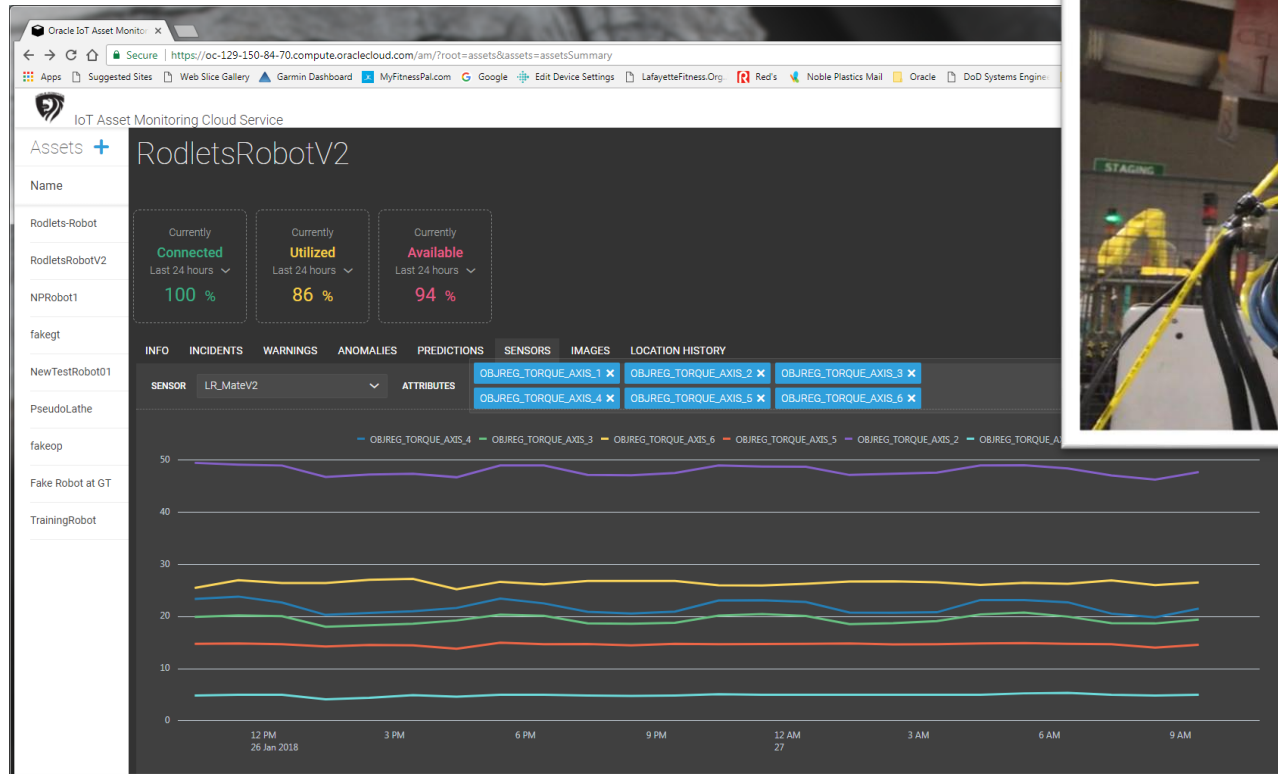
**IoT Asset
Monitoring Cloud**



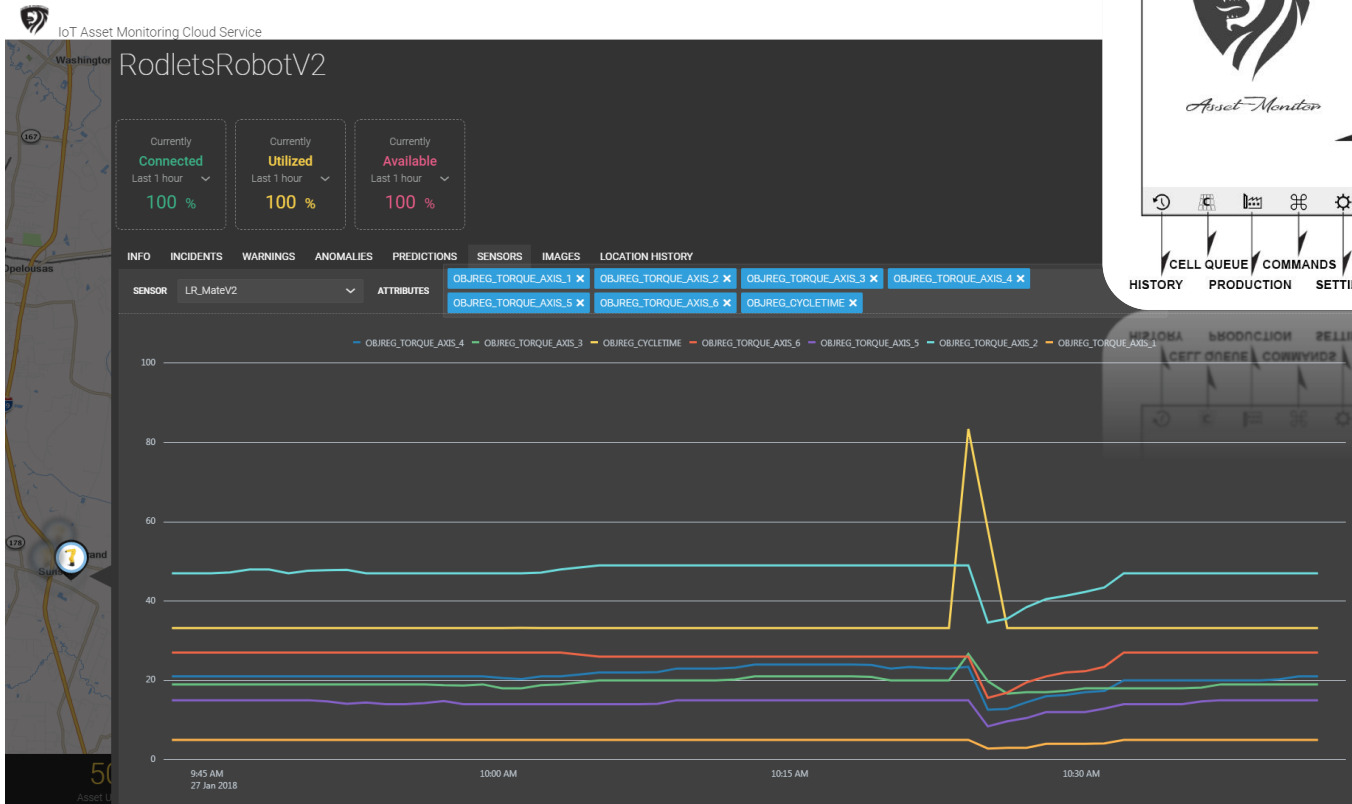
Simulated Robot



Real Robot



Getting Smarter



ERP

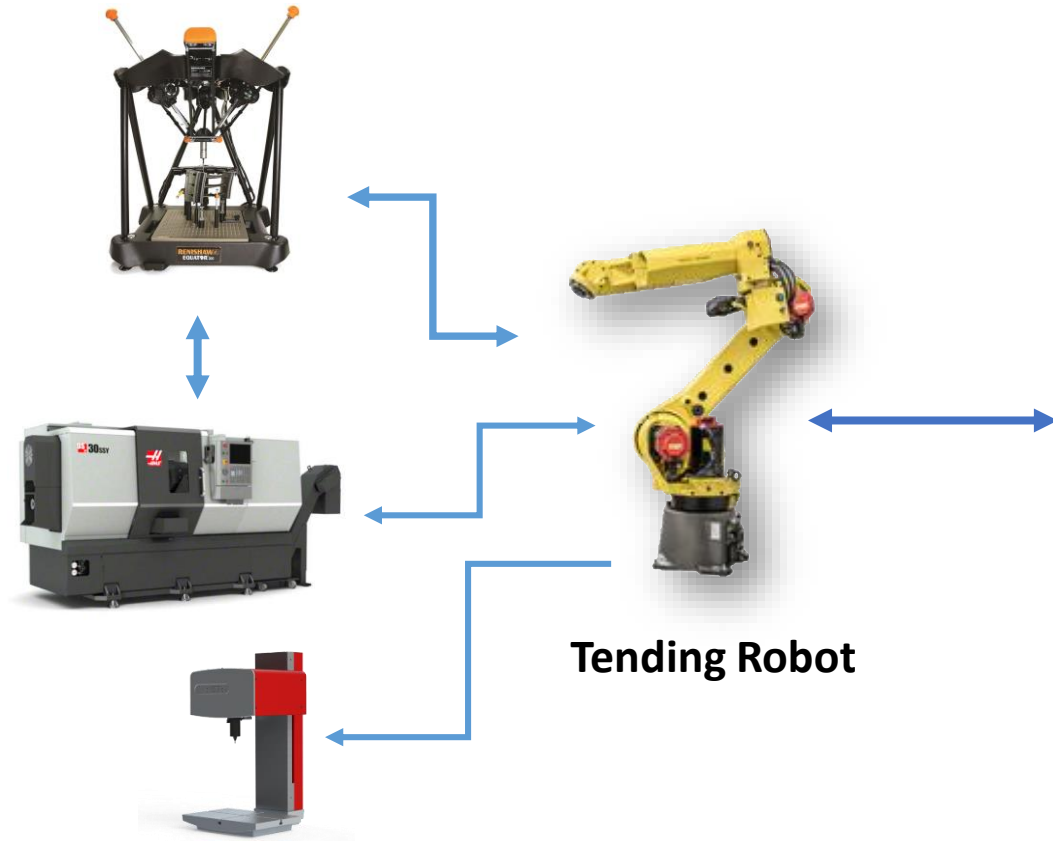


IoT Asset Monitoring Cloud



Cloud Connected

Process Monitoring



ERP/SPC



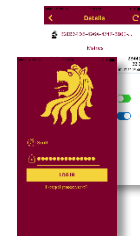
IoT Asset
Monitoring Cloud



Tending Robot

Design & Production

Mobile Cloud Service

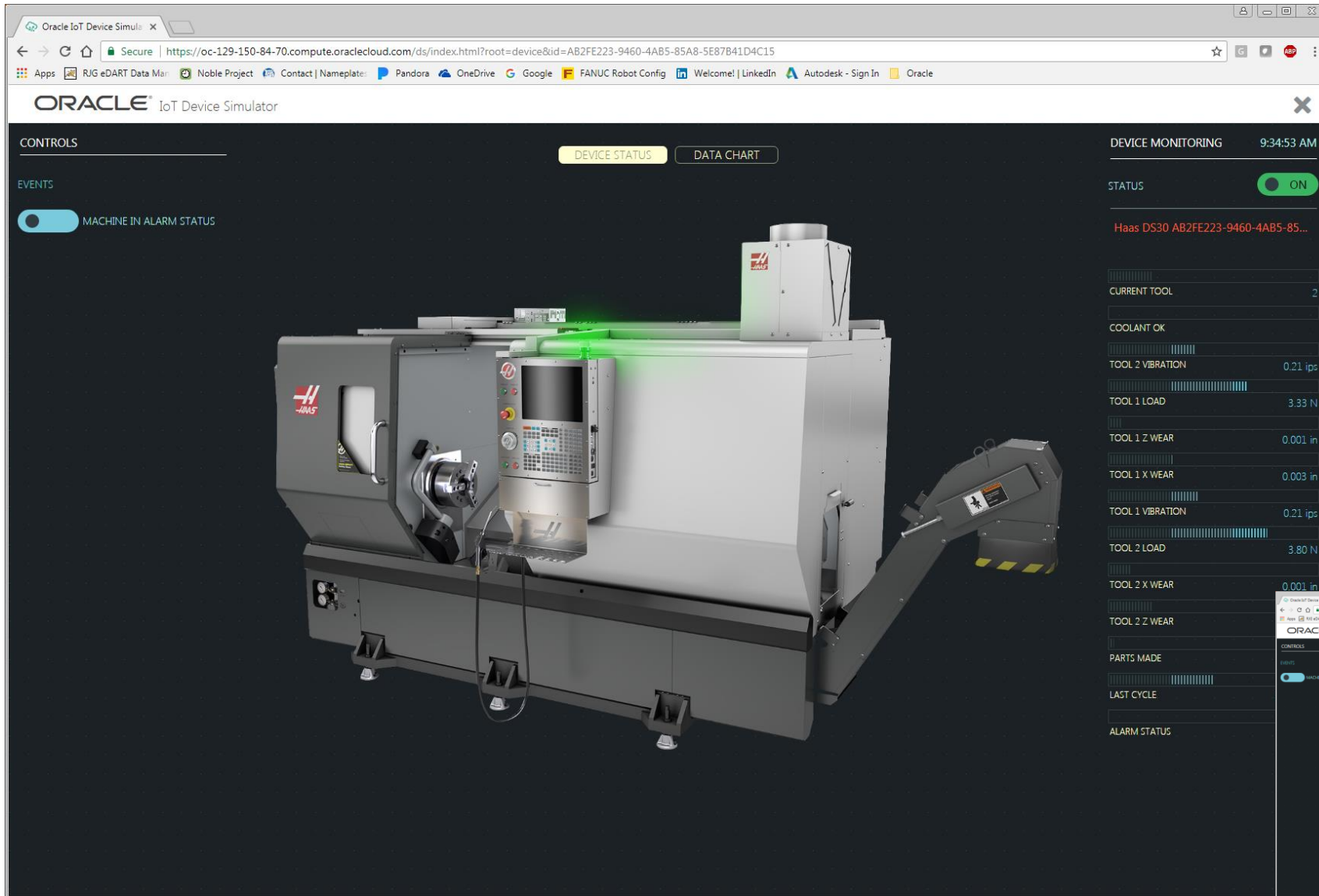


Monitor manufacturing cycle data

Analyze streaming part metrics, error status in real-time

Send **real-time alerts** to appropriate personnel

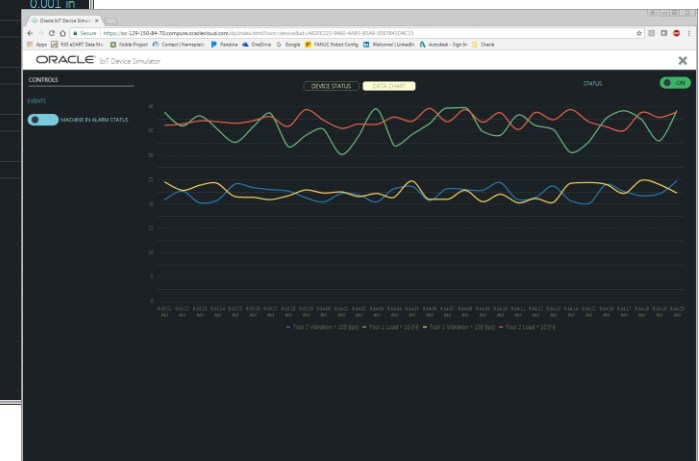
Improve visibility into lights-out shifts. **Enable remote control**



The screenshot displays the Oracle IoT Device Simulator interface. On the left, there is a 3D model of a Haas DS30 machine with a green light on top. The interface includes a 'CONTROLS' section with a 'MACHINE IN ALARM STATUS' toggle. The 'DEVICE MONITORING' section shows the following data:

Metric	Value
STATUS	ON
CURRENT TOOL	2
COOLANT OK	
TOOL 2 VIBRATION	0.21 ips
TOOL 1 LOAD	3.33 N
TOOL 1 Z WEAR	0.001 in
TOOL 1 X WEAR	0.003 in
TOOL 1 VIBRATION	0.21 ips
TOOL 2 LOAD	3.80 N
TOOL 2 X WEAR	0.001 in
TOOL 2 Z WEAR	0.001 in
PARTS MADE	
LAST CYCLE	
ALARM STATUS	

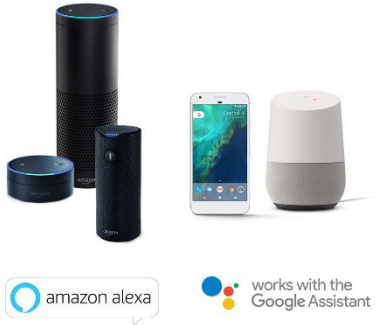
- Monitor
- Alert
- Predict



Value Proposition 4.0

Waste Reduction
Utility Improvement
Customer Experience

Supply Chain Focus



Digital Thread with Supply Chain Management



Interconnected supply chain with real time visibility

- Design → Manufacturing → Logistics → Transportation → Service



Integrate Organization Silos

- IT and OT, Logistics and Finance, Production and Design



Transformative Business Models

- Product as a Service, Dynamic planning based on demand signals

Opportunity for Disruption





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