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Digital et 4ième révolution industrielle

Eric Prevost
Vice President, Industry 4.0 & Emerging Technologies

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Enjeux

Society & economy Changes

- L'institut Montaigne indique qu'en Europe, une voiture reste garée 90% de son temps et 31% des produits agricoles sont perdu avant consommation, par ailleurs, un récent sondage international de Zuora montre que 70% des adultes sont d'accord que le paiement a l'usage de produits et services libère les personnes de la charge financière de la possession

Climate Changes

- 40 % des acheteurs de technologies industrielles préfèrent acheter via des distributeurs car les commerciaux des manufacturiers sont trop long à leur répondre. Et 42%, ne sont pas en mesure d'avoir une réponse rapide en cas de problèmes après ventes.
  86% des clients B2B sont prêt à payer plus pour un meilleur service

- D'après les nations unies et le GIEC, pour atteindre les objectifs de réduction d'émission de Gas à effet de serre, notre activité industrielle et de consommation doit être 55% plus faible qu'aujourd'hui d'ici 2030, et 78% de la hausse des émissions totales de gaz à effet de serre peut être attribuée à l'usage de combustibles fossiles et aux procédés industriels

Technology changes

- D'après Gartner 50 Milliards d'objets seront connectés d'ici 2020

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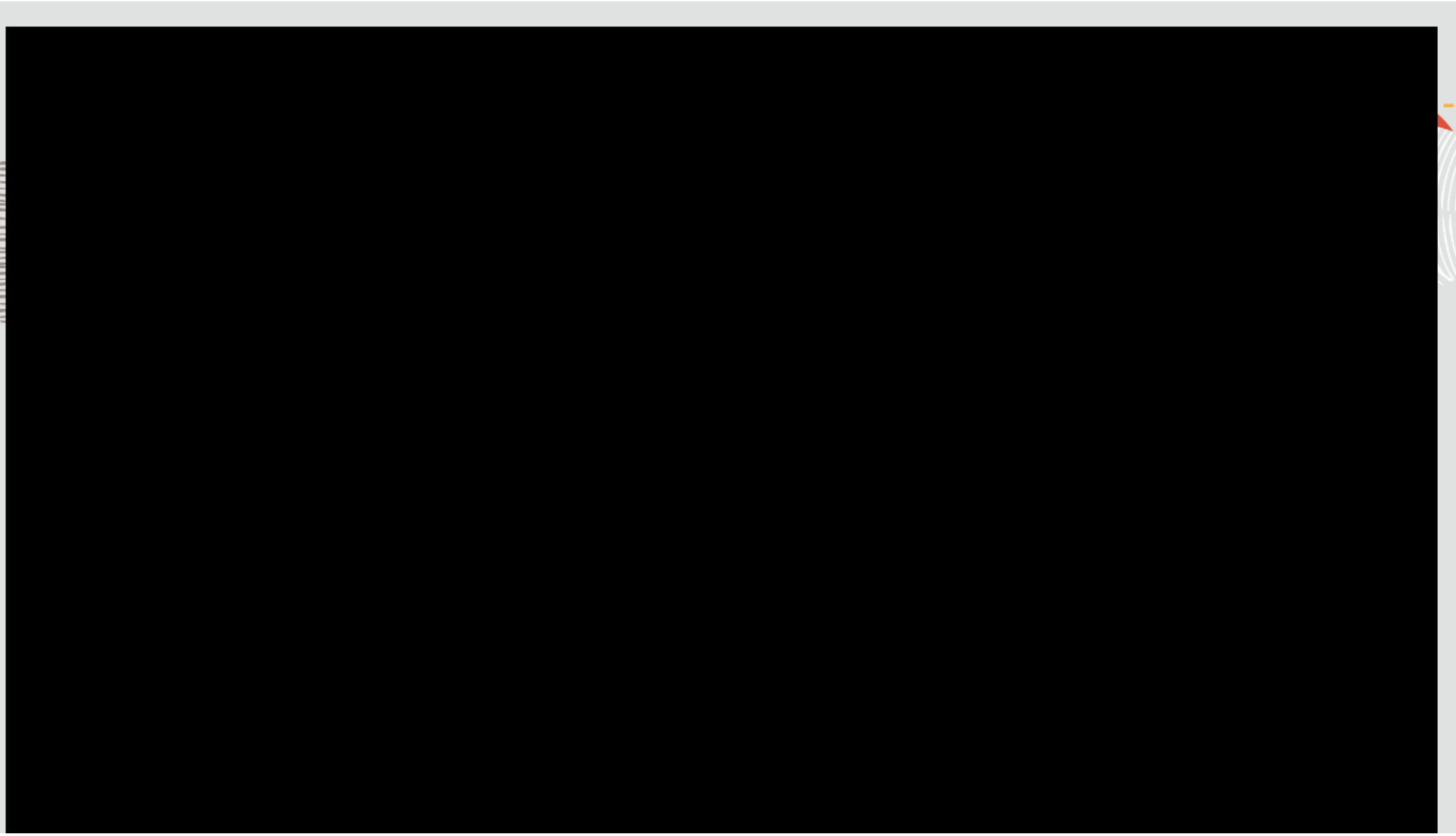
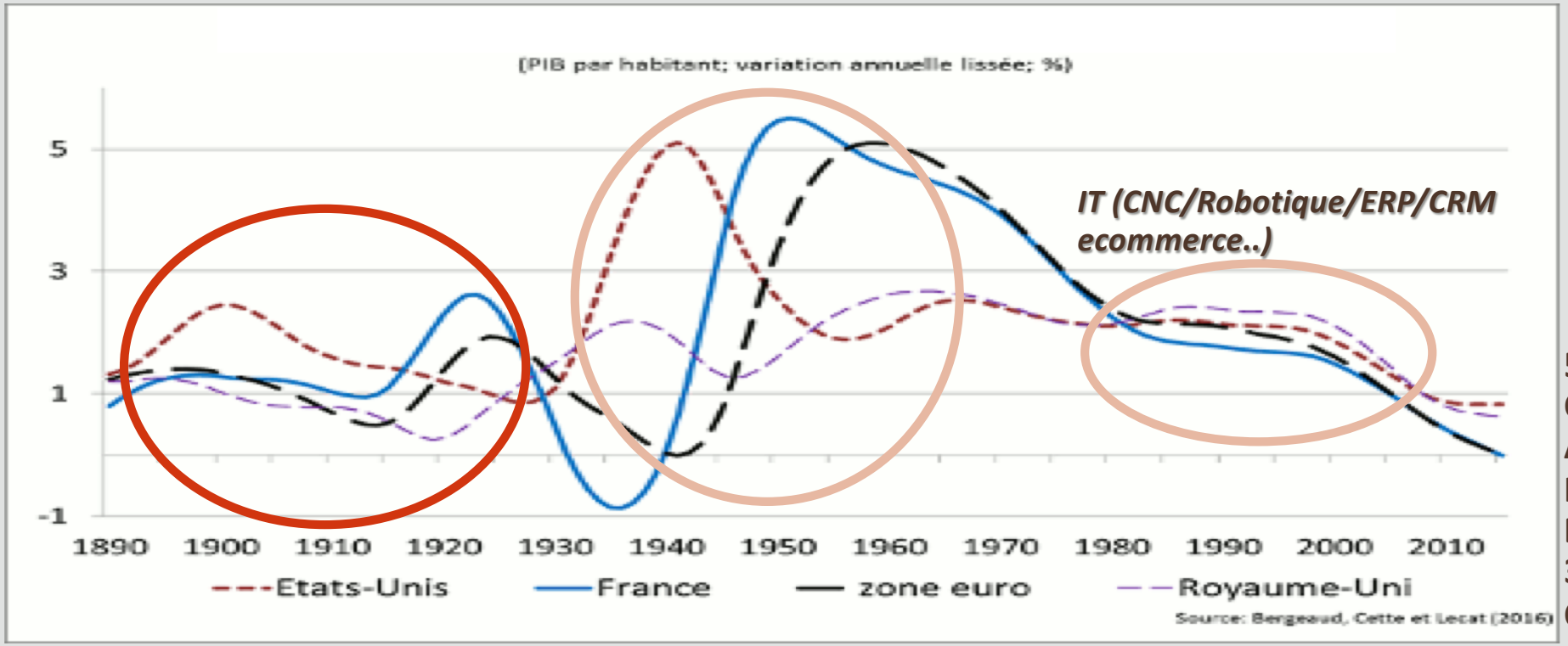


Manufacturer Industrials are Experiencing Considerable Disruption

- **Consumer demand variability** is changing manufacturing processes (Compact & Multipurposes plants, Full kitting,…)
- **Market competition** is forcing to operational performance & diversification.
- **New digital business models** are disrupting manufacturing companies.
- **We are only at the beginning** of the 4th industrial revolution.

Why the 4th Industrial revolution is different
Cloud/5G/IOT/Blockchain/Cloud data/AI are the new steam power revolution!



5G
Cloud
AI
IOT
Blockchain
3D
Cobot

DISRUPTION IN MANUFACTURING, DISTRIBUTION and SERVICES ARE **ACCELERATING**

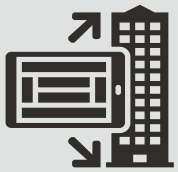
COMPANIES MUST MOVE FAST TO THRIVE

SMART MANUFACTURING

Hyper connectivity is improving quality, efficiencies, and opening up new opportunities

PACE OF INNOVATION

More than ever it is challenging to keep up with rapid innovations in products, services, capabilities, and processes



NEW BUSINESS MODELS

New digital capabilities are enabling creative service and business models for increasing revenue and customer satisfaction

GLOBALIZATION

Companies must adapt to increasing and diverse compliance, accounting, sustainability, and competitive pressures

NEW TECHNOLOGIES ARE SERVING AS BOTH DISRUPTORS AND CATALYSTS FOR SIGNIFICANT INDUSTRY CHANGE

What is urgent to change to be an Industry 4.0 company?

1. Be an intelligent, accurate and realtime data driven company
2. Breaking company silos
3. Design and Do scalable projects
4. Be agile (start, stop, remove, create, change..)
5. Go fast and cheap
6. Think and act global & local at the same time
7. Work with an ecosystem as a open platform
8. Helping people to take decisions in a complex world
9. Make it modern and collaborative for people
10. Move from supplier mindset to connected partner with your customers

Democratizing advanced technologies for data capture, storage and usage

Data as a Service

- DaaS for Marketing
- DaaS for Social

Software as a Service

- Sales
- Service
- Commerce
- Configure, Price & Quote
- Global Human Resources
- Talent Mgmt
- Financials
- Project Portfolio Mgmt
- Procurement
- Value Chain Execution
- Product Value Chain

BlockChain

Platform as a Service

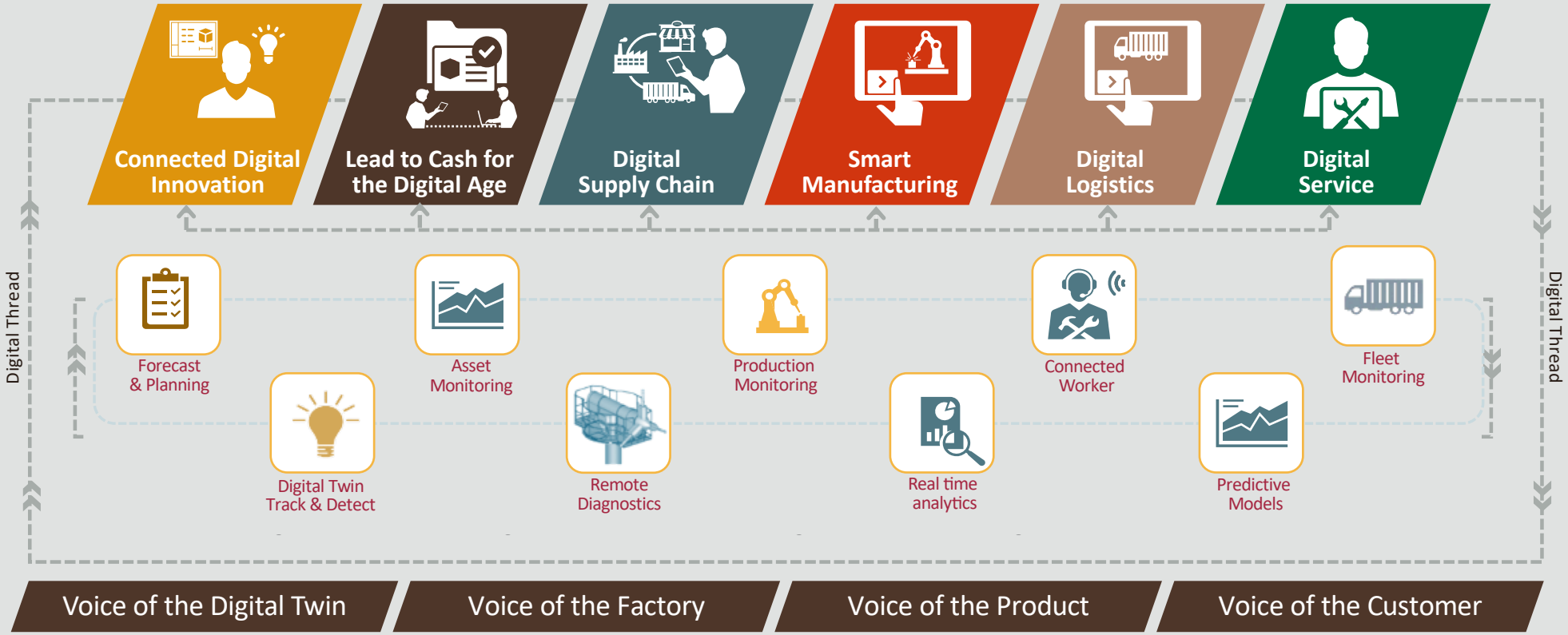
- Documents
- Social Network
- Business Process Mgmt
- Integration
- Cloud Marketplace
- IOT
- Dev Ops
- Mobile
- Big Data
- Business Intelligence
- Blockchain
- IT Analytics

Infrastructure as a Service

- Storage
- Compute
- Messaging
- Identity
- Deep learning

Digital Thread – End to End Business Application from CX/ERP/SCM/Service

Leveraging Technology to Improve Enterprise Visibility, Speed, and Agility



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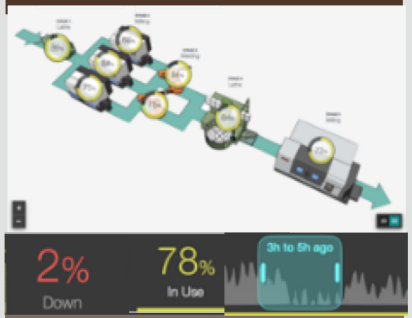
Digital Twin - PURPOSE BUILT IOT APPLICATIONS

FASTER ADOPTION, LOWER RISK, LESS INVESTMENT, BETTER OUTCOMES

Asset Monitoring

Monitor assets, their health, utilization and availability

Production Monitoring

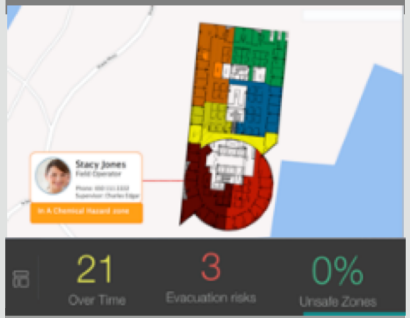


Manufacturing equipment and production line monitoring and prognostics

Fleet Monitoring

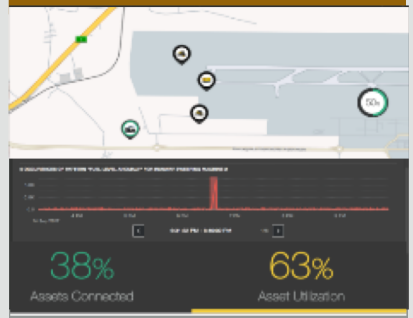
Monitor shipments, fleet vehicles, driver behavior and costs

Connected Worker



Enhance worker safety through monitoring of workers and environment

Service Monitoring for Connected Assets



Automate asset monitoring and Customer Service to enhance customer experience

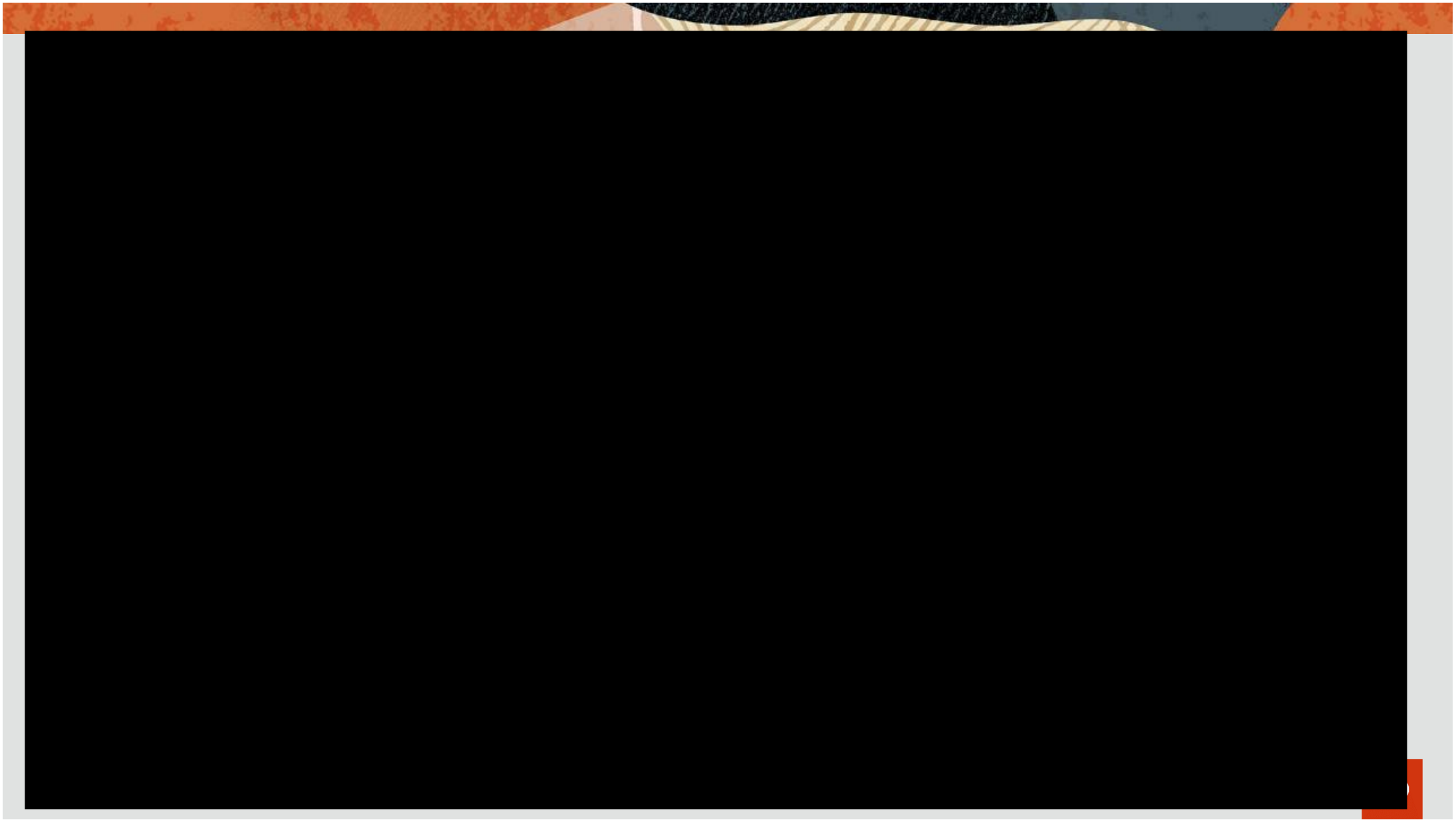
Internet of Things Cloud Enterprise (Platform)

Connect 

Analyze 

Integrate 

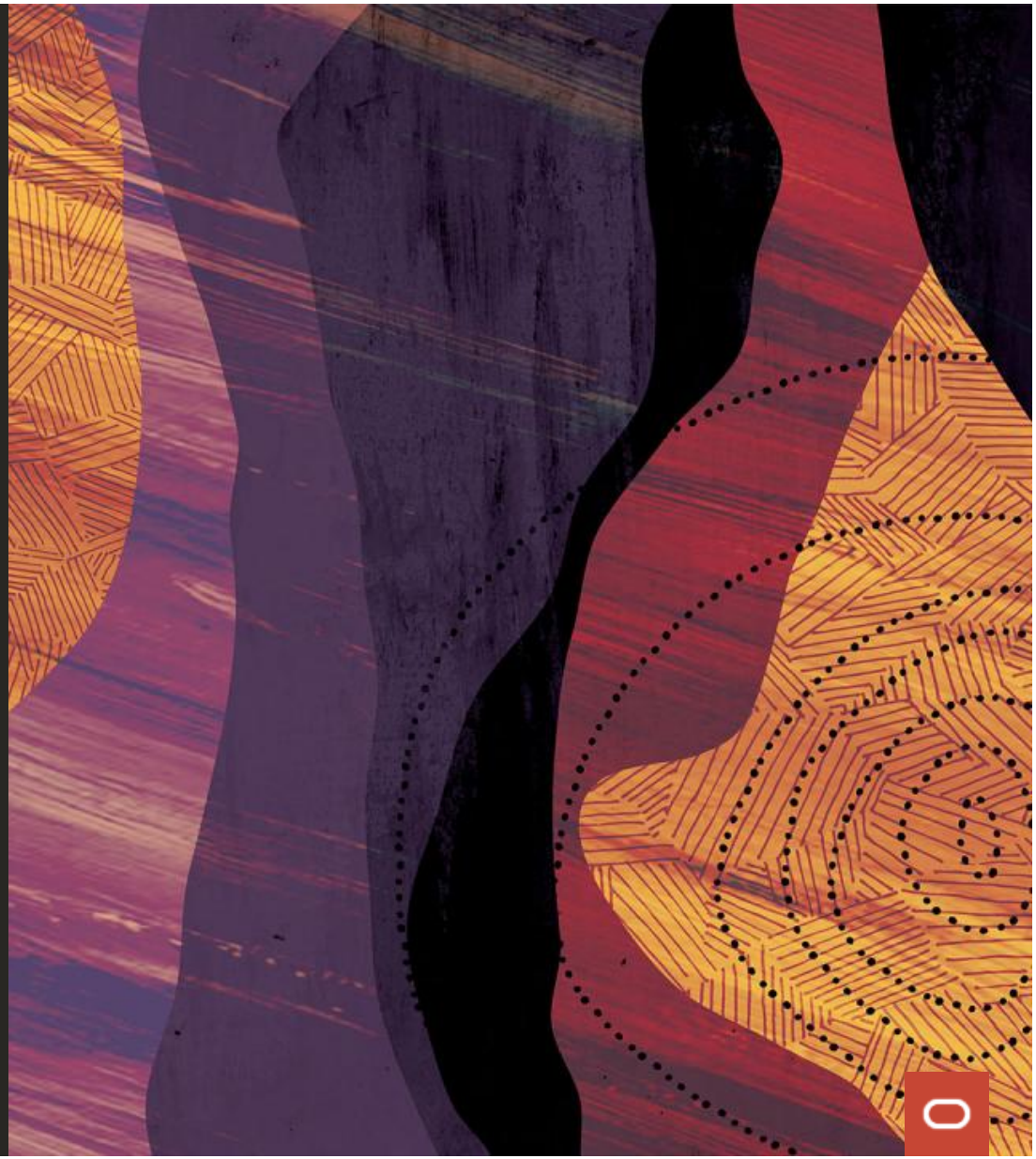
Learn 



Merci

Eric Prevost

Vice President Industry 4.0
Oracle Industry Solution Group



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Integrated Cloud

Applications & Platform Services

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CUSTOMER PERSPECTIVE

If we can reduce our manufacturing cycle time, it's a huge deal for our customers—and for us.

Scott Rogers
Technical Director, Noble Plastics

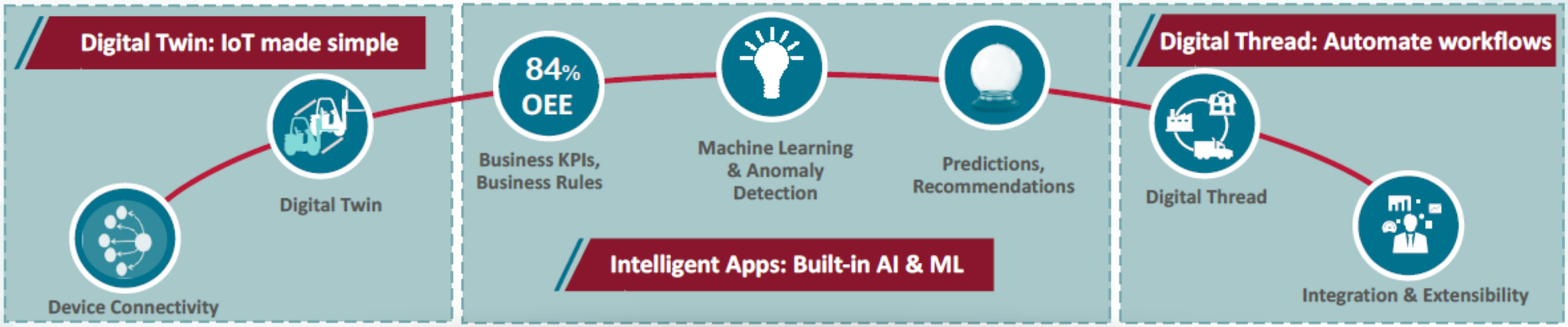
Improve Customer Satisfaction

Innovative Plastics Manufacturer servicing energy, consumer, veterinary and military sectors

Changing the Way….

- Highly automated manufacturing facility
- Lights-out third shift
- Leverages Oracle IoT to:
  - Reduce cycle time
  - Improve manufacturing process
  - Enhance product quality

IoTify your Business Applications



Connect | **Analyze** | **Integrate** | **Learn**

- Asset Monitoring
- Production Monitoring
- Fleet Monitoring
- Connected Worker
- Service Monitoring for Connected Assets

Real-time Visibility & Monitoring | Out-of-the box Analytics for business user | Integrated with SCM, CX apps

FOCUS ON BUSINESS OUTCOMES

Detect

- Track movement
- Read temperature
- Gauge humidity
- Sense vibration

Device Signals

Analyze

- Visualize status
- Contextualize events
- Predict failures
- Trigger alerts
- Update device parameters

Business Events

Act

- Dispatch service
- Reroute shipments
- Substitute materials
- Replan supply
- Initiate billing events

IoT Devices

- Building Sensors
- Equipment
- Logistics
- Mobile Devices

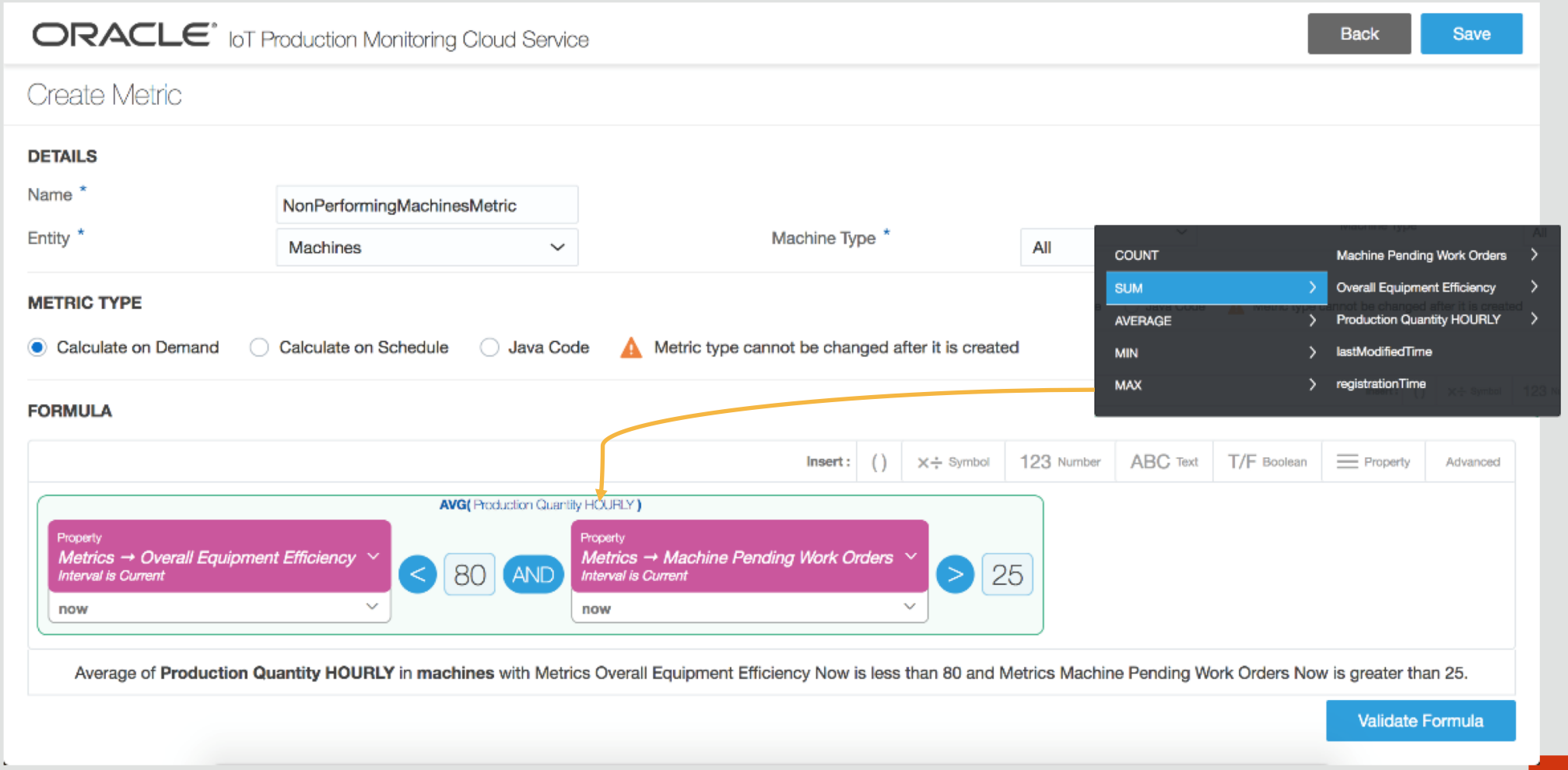
IoT Cloud Applications

- Asset Monitoring
- Production Monitoring
- Fleet Monitoring
- Connected Worker

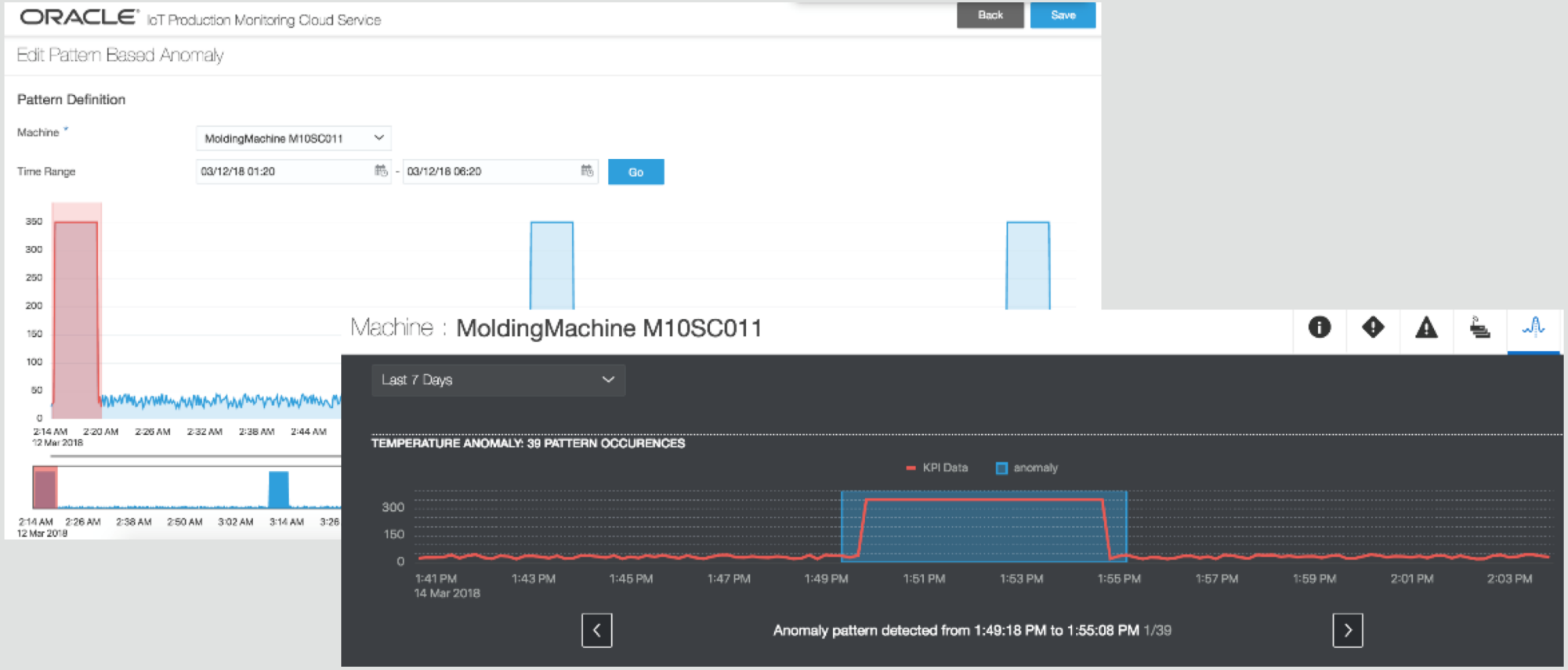
Application Clouds

- Revenue and Billing
- Manufacturing
- Logistics
- Service

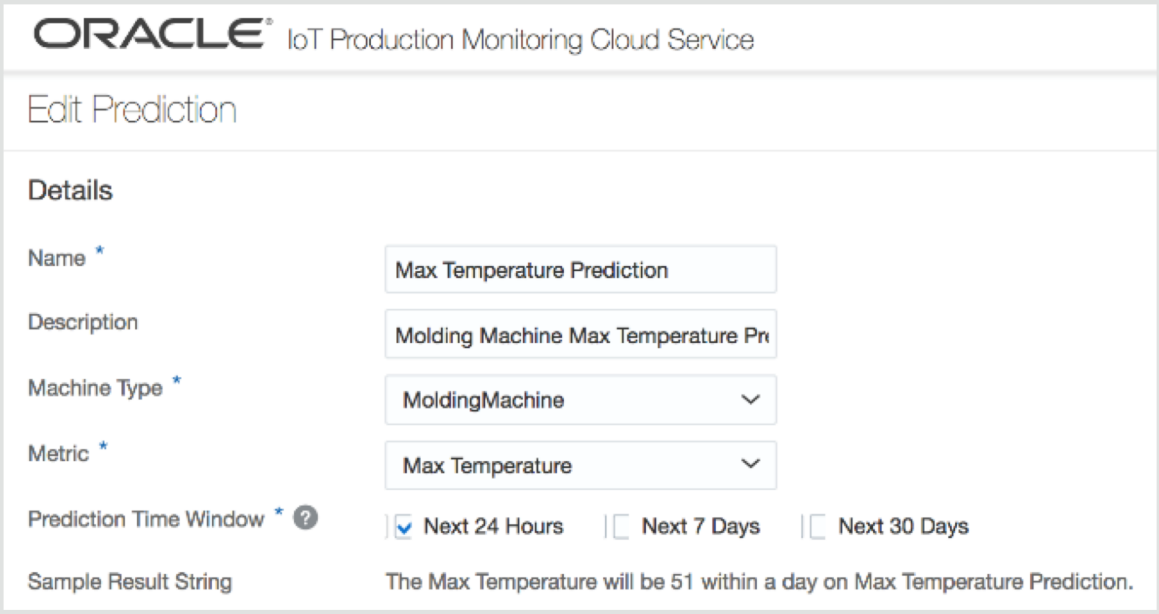
KPI editor for business user



Anomaly detection for business user

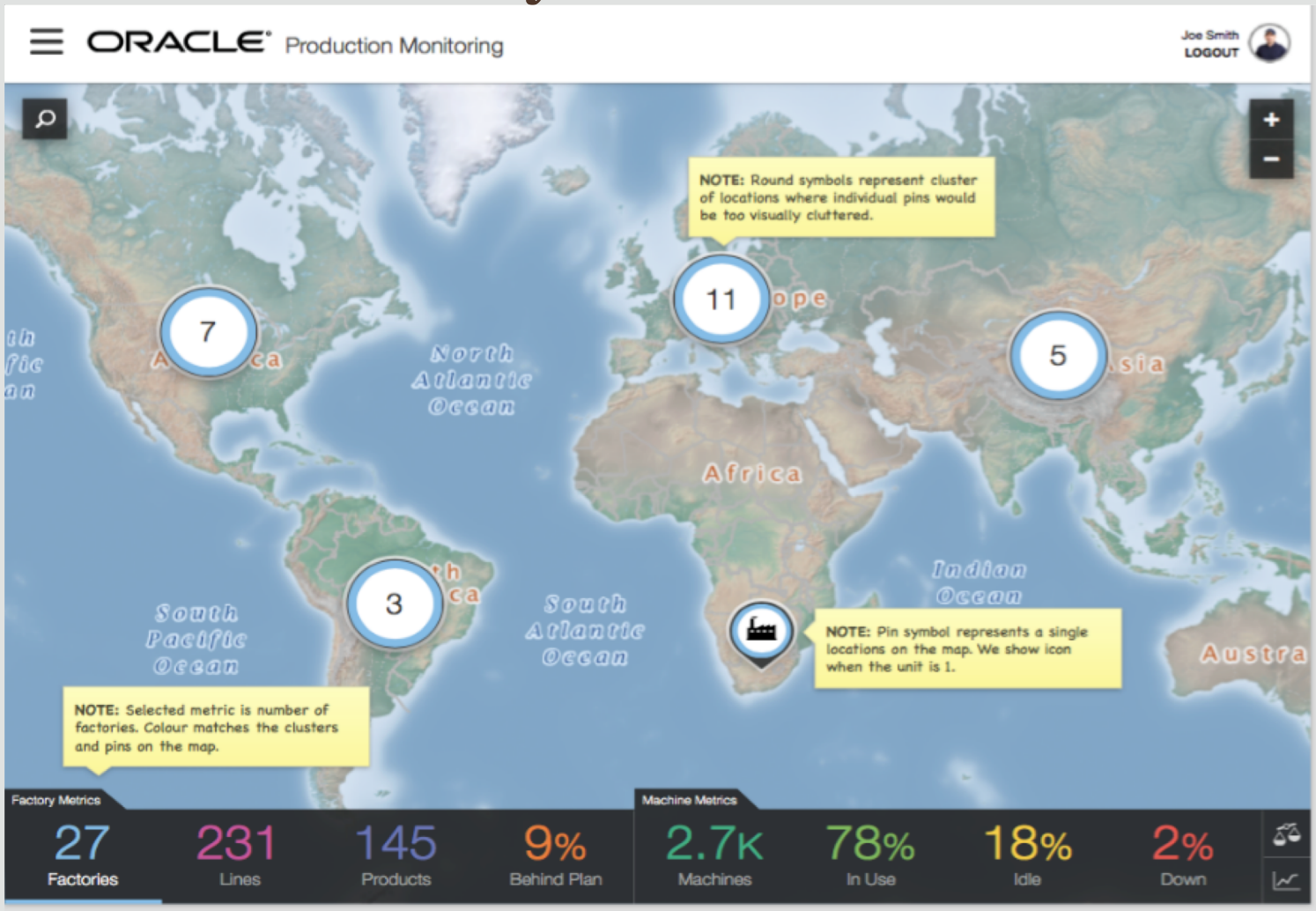


Predictions for business user



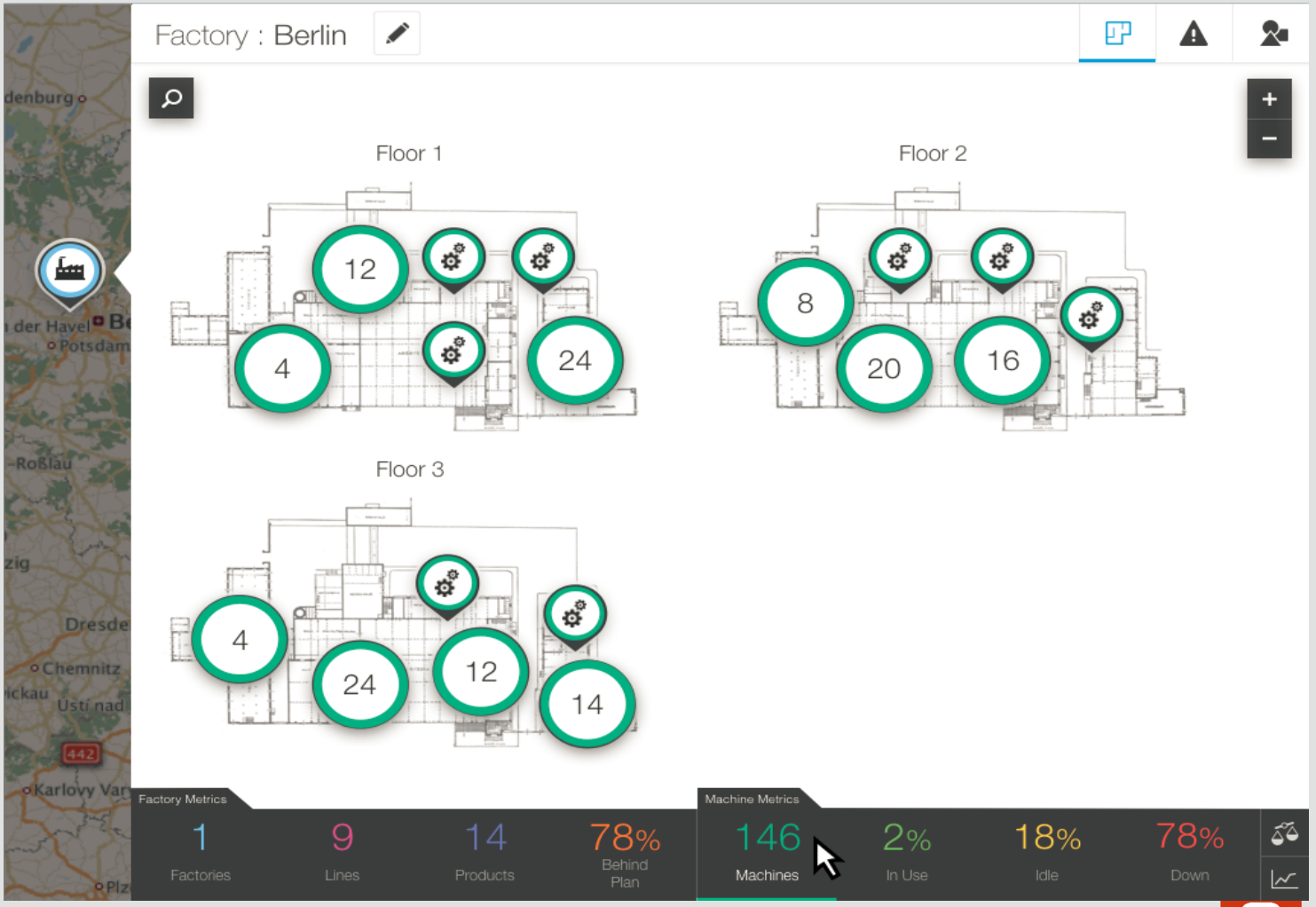
Real Time Operational Visibility

1. Monitor real time performance of factory, product and machines.
2. Derive and track performance KPIs from sensor and integrated manufacturing systems data.



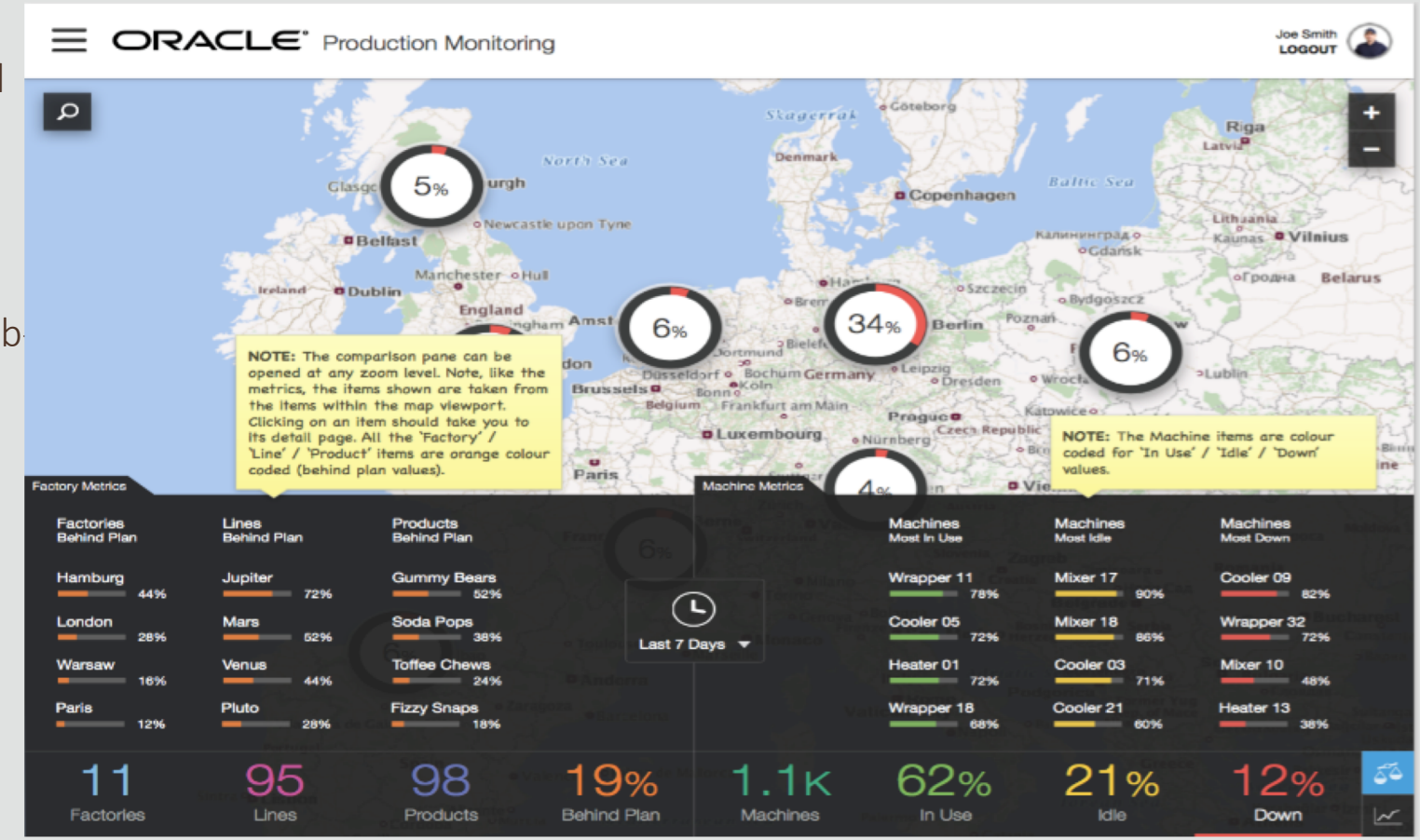
Real Time Operational Visibility

1. Deep dive using map, factory floor plan and product routing views to gain insights on operational inefficiency.
2. Designed for factory manager and business user with responsive UI and multi dimensional search.



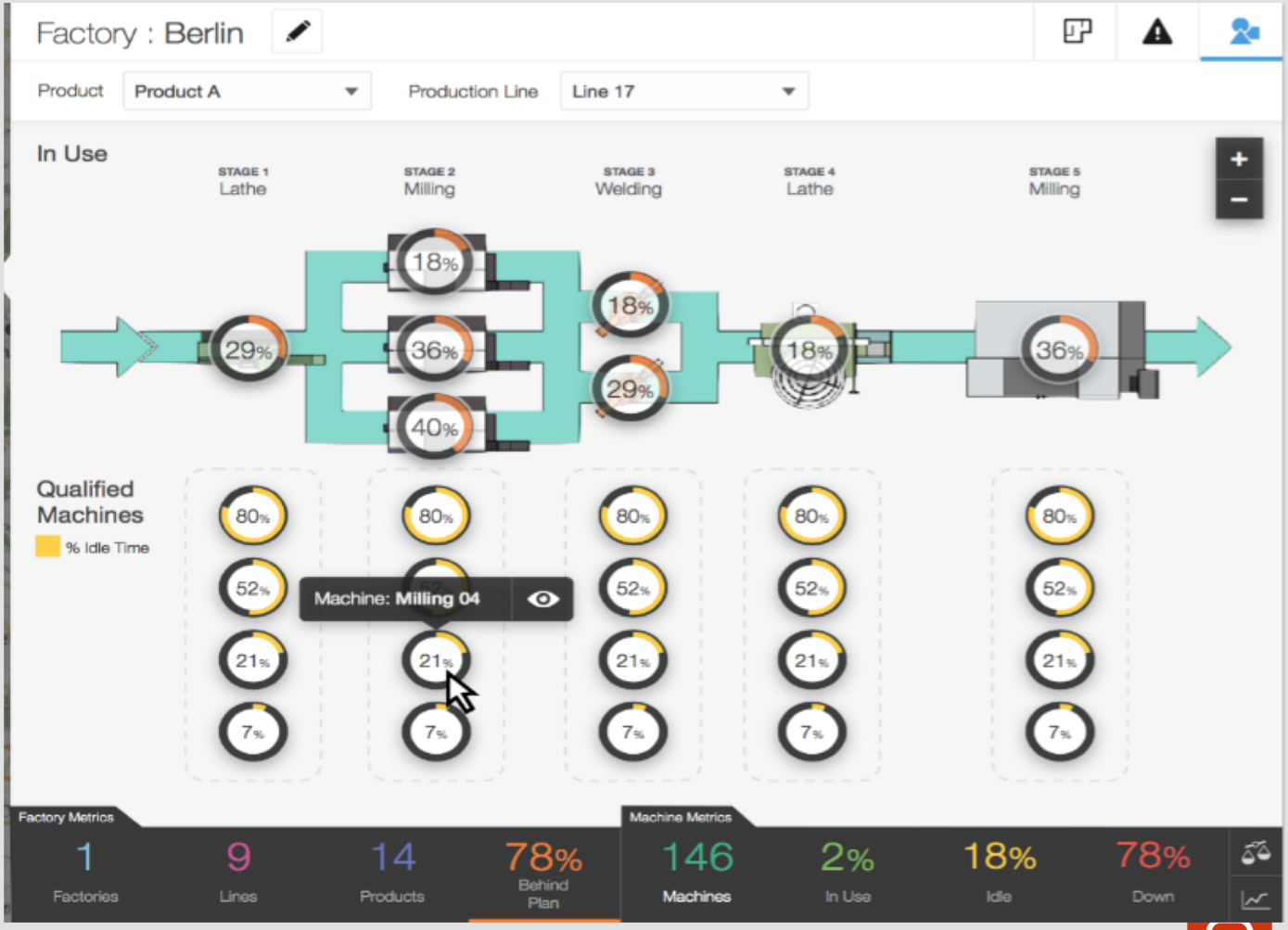
Identify Factory, Product, Machine for Improvement

1. Compare KPIs across factories, products and machines to identify best and worst performers.
2. Analyze KPIs over time to understand if the sub-par performance is enduring.



Identify Factory, Product, Machine for Improvement

1. Compare KPIs across factories, products and machines to identify best and worst performers.
2. Analyze KPIs over time to understand if the sub-par performance is enduring.
3. Identify root cause of sub-par performance using deep dive on specific KPIs and sensor data.
4. Choose machines that should be improved for on time product delivery.



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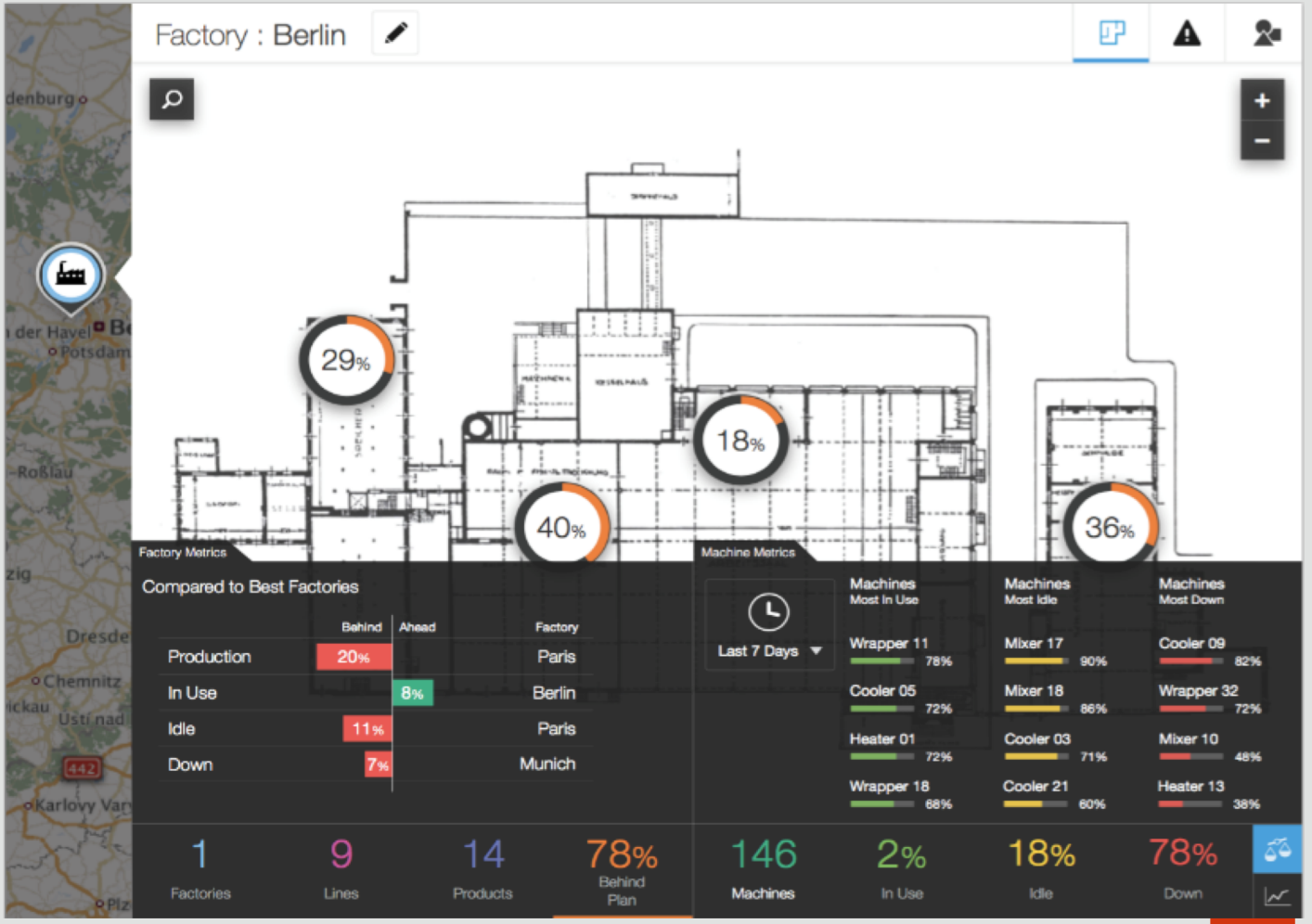
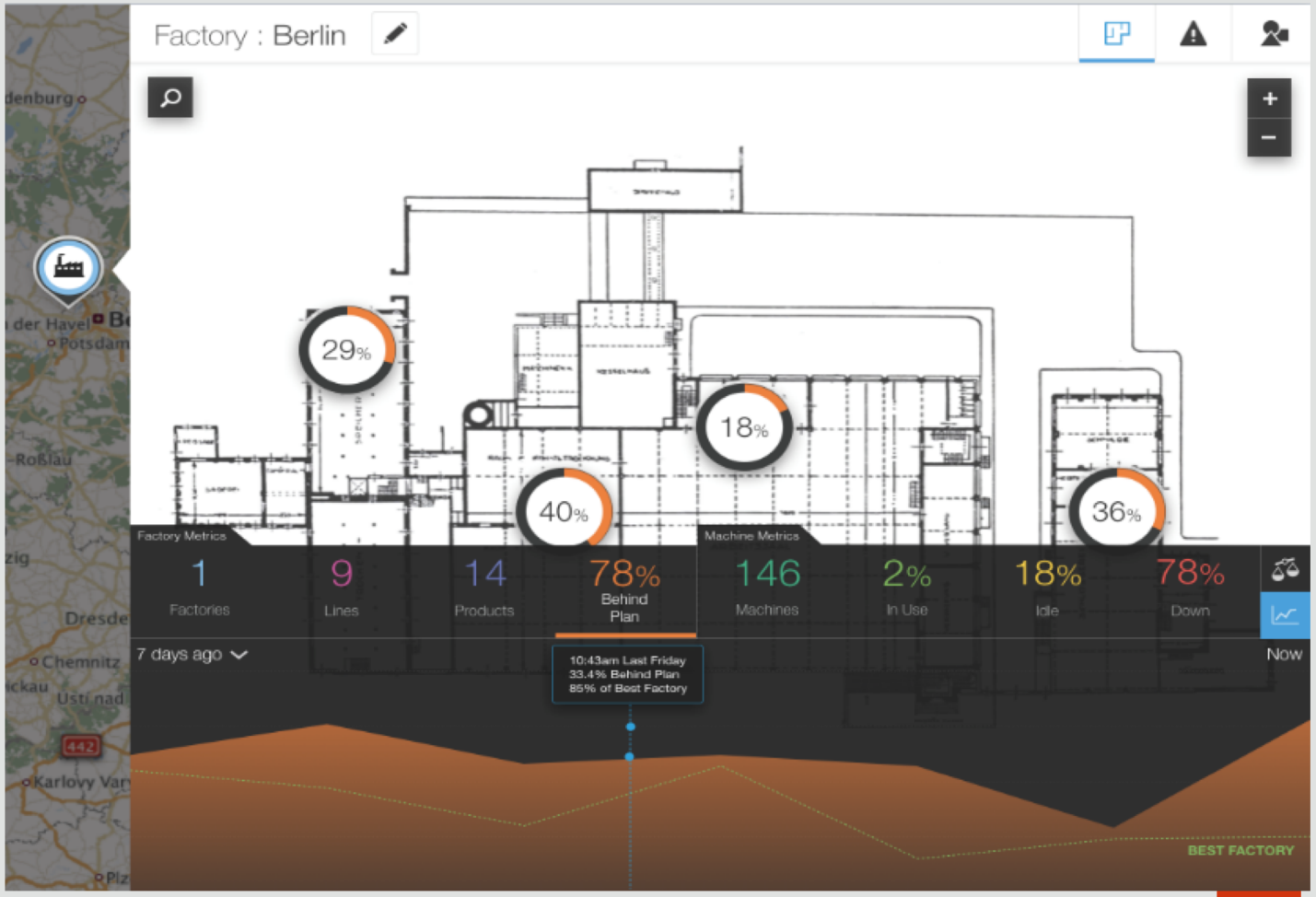


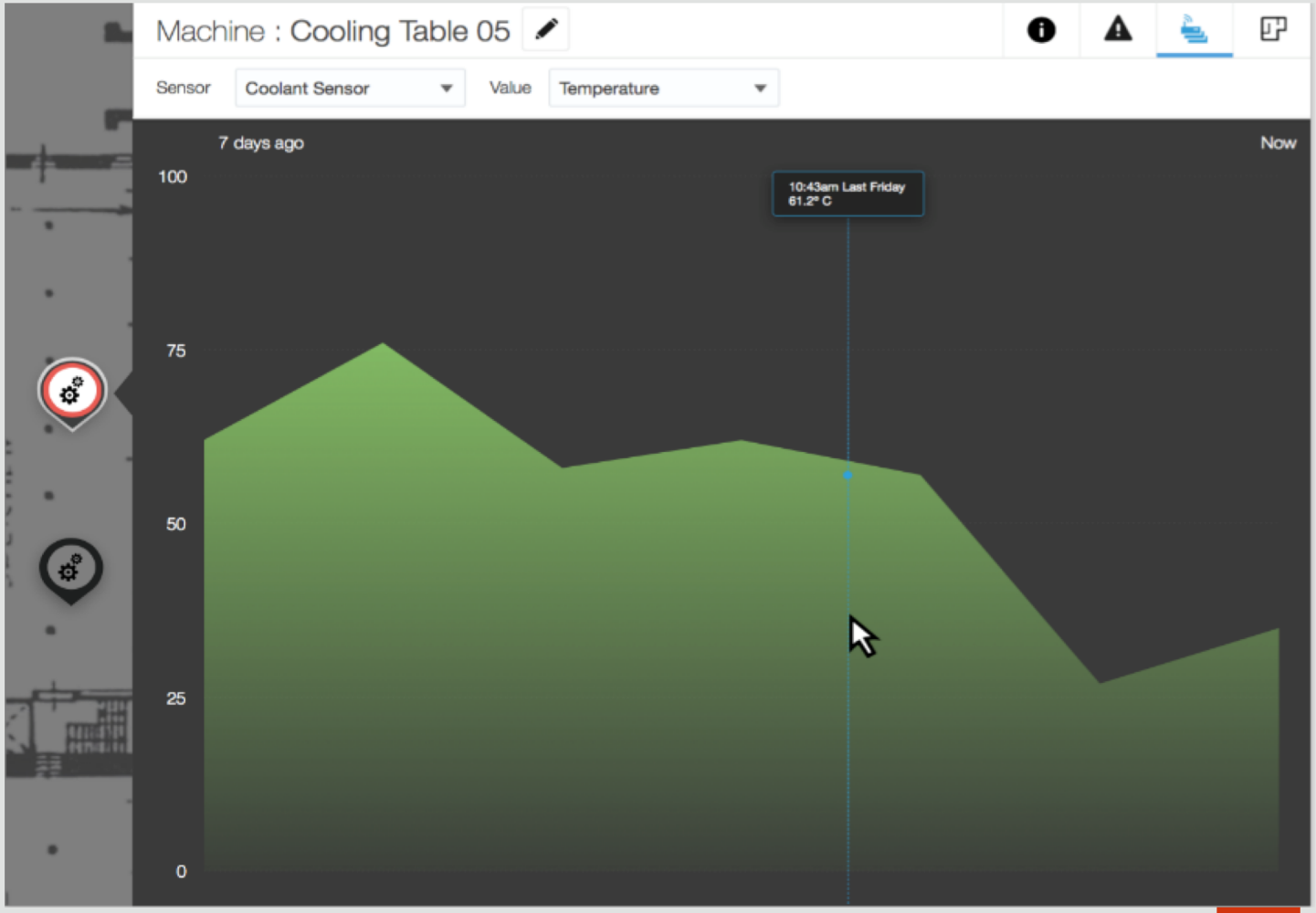
Understand and Improve Machine Uptime

1. Monitor machine performance via real time KPIs.
2. Study real time and historical sensor data and machine KPIs to understand machine health.



Understand and Improve Machine Uptime

1. Identify anomalies in machine performance and its effect on production.
2. Learn and act to improve machine health and factory uptime.



Oracle Smart Connected Factory Solution

OMRON

OSIsoft

MatrikonOPC

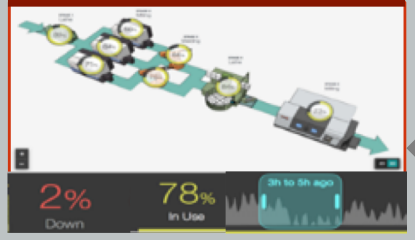
Rexroth Bosch Group

SIEMENS

MITSUBISHI ELECTRIC
Changes for the Better

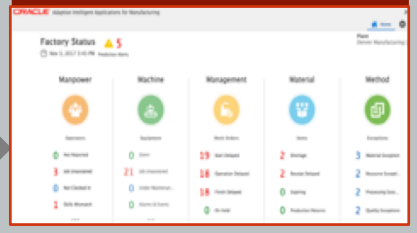
Client Libraries

IoT Production Monitoring



Real-time
Manufacturing equipment & production line monitoring & predictive maintenance

AI App for Manufacturing



Historical
Manufacturing yield & quality insights & root cause analysis. Traceability and impact analysis.

Connect → Analyze → Integrate → Learn

Oracle Manufacturing Cloud

Oracle Maintenance Cloud

ORACLE E-BUSINESS SUITE

NETSUITE

ORACLE JD EDWARDS ENTERPRISEONE

SAP

Data from Machines and Equipment
•Leverage automated and manual upload capabilities to ingest data from sensor-enabled equipment, machines, and facilities on the shop floor.

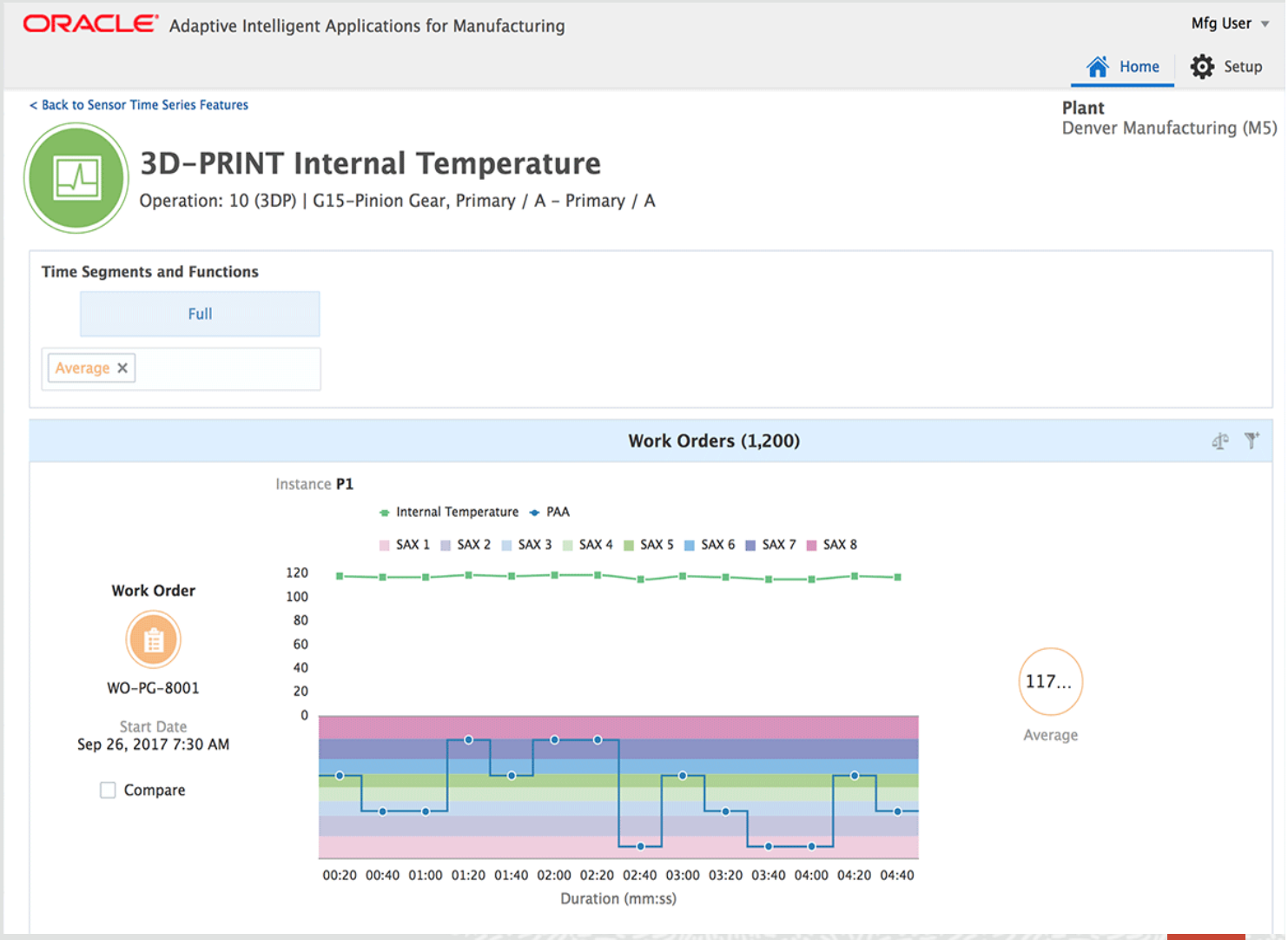
Data from Enterprise Applications
•Ingest data from transactional applications such as MES, Quality Management, LIMS, ERP, SCM, HCM, and CRM.

Embedded Data Management Platform
•**Utilize embedded Oracle PaaS** technologies across database and big data stacks running on Oracle Cloud Infrastructure that support a manufacturing-aware data lake, storing structured, semistructured, and unstructured data from a variety of sources.

Operational Technology (OT) and IT Data Contextualization
•Use inbuilt capabilities to contextualize data coming from sensor-enabled machines and equipment (OT data) with transactional data (IT data) coming from applications such as MES, Quality Management, LIMS, ERP, SCM, HCM, and CRM. Get a comprehensive snapshot of the manufacturing state at any given point in time.

Sensor-Time-Series Data
•Convert continuous streams of sensor-time-series data from machines and equipment into time-window aggregates using Symbolic Aggregate approXimation (SAX) to facilitate machine-learning analysis.

5M Data Preparation
•Organize the massive data present in the data lake into 5M categories (manpower, machine, method, material, and management) with a preseeded library of attributes from Oracle applications (as well as custom attributes) to facilitate comprehensive analysis of the entire manufacturing process.



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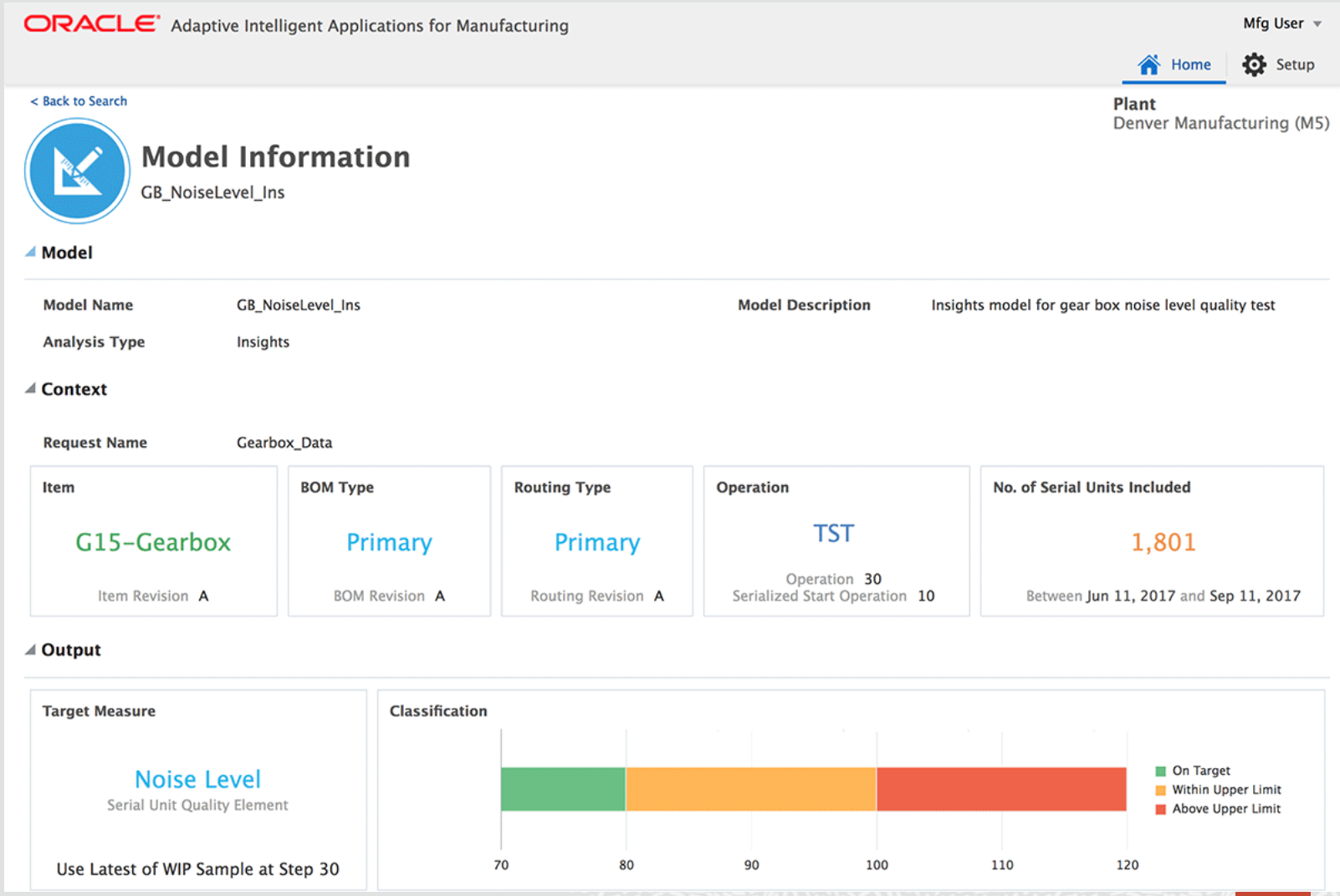
Model Creation
•Leverage simple and intuitive user interfaces to allow data scientists to create an unlimited number of descriptive and predictive models for analyzing key performance indicators (KPIs) such as yield, quality, cycle time, scrap, rework, and cost.

Model Training and Deployment
•Continuously train models with historical training data sets to attain the required accuracy levels and scores. One-touch deployment allows selected models to be immediately deployed for monitoring ongoing manufacturing processes.

Model Performance Evaluation
•Evaluate accuracy of predictive models using a confusion matrix by comparing predicted values with actuals. Continue to refine the models for improved accuracy.



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5M Input Factors

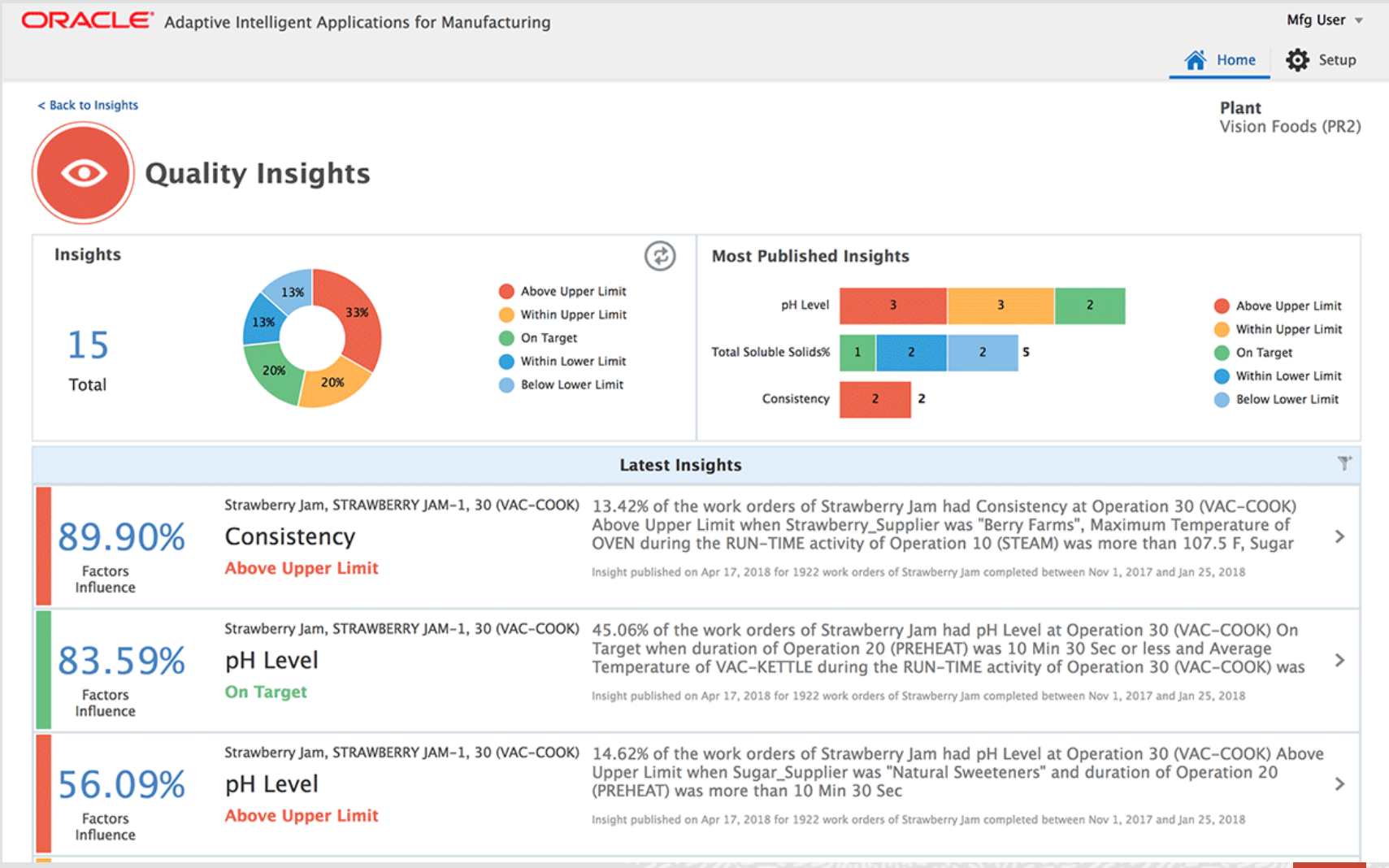
•Analyze 5M-related information from manufacturing operations to understand the impact on key business outcomes.

Top Influencing Factors

•Identify the factors and variables in the manufacturing environment that have the highest influence on key performance metrics.

Patterns and Correlations from Historical Data

•Identify the relationship between a multitude of influencing factors and variables from the manufacturing process that affect KPIs such as yield, quality, cycle time, scrap, rework, and costs.



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Critical Outcomes During Manufacturing

•Compare current manufacturing conditions against suspect patterns from historical data analysis to predict potential yield loss and product defects.

Prediction Alert Rules

•Configure the application to receive alerts for predictions that match specific conditions such as probability and product context.

Downstream Orchestration

•Subscribe to published REST services for predictive alerts (for example, put the job on hold or create quality nonconformance) to create transactions in other applications.

Self-Guided Navigation for Traceability

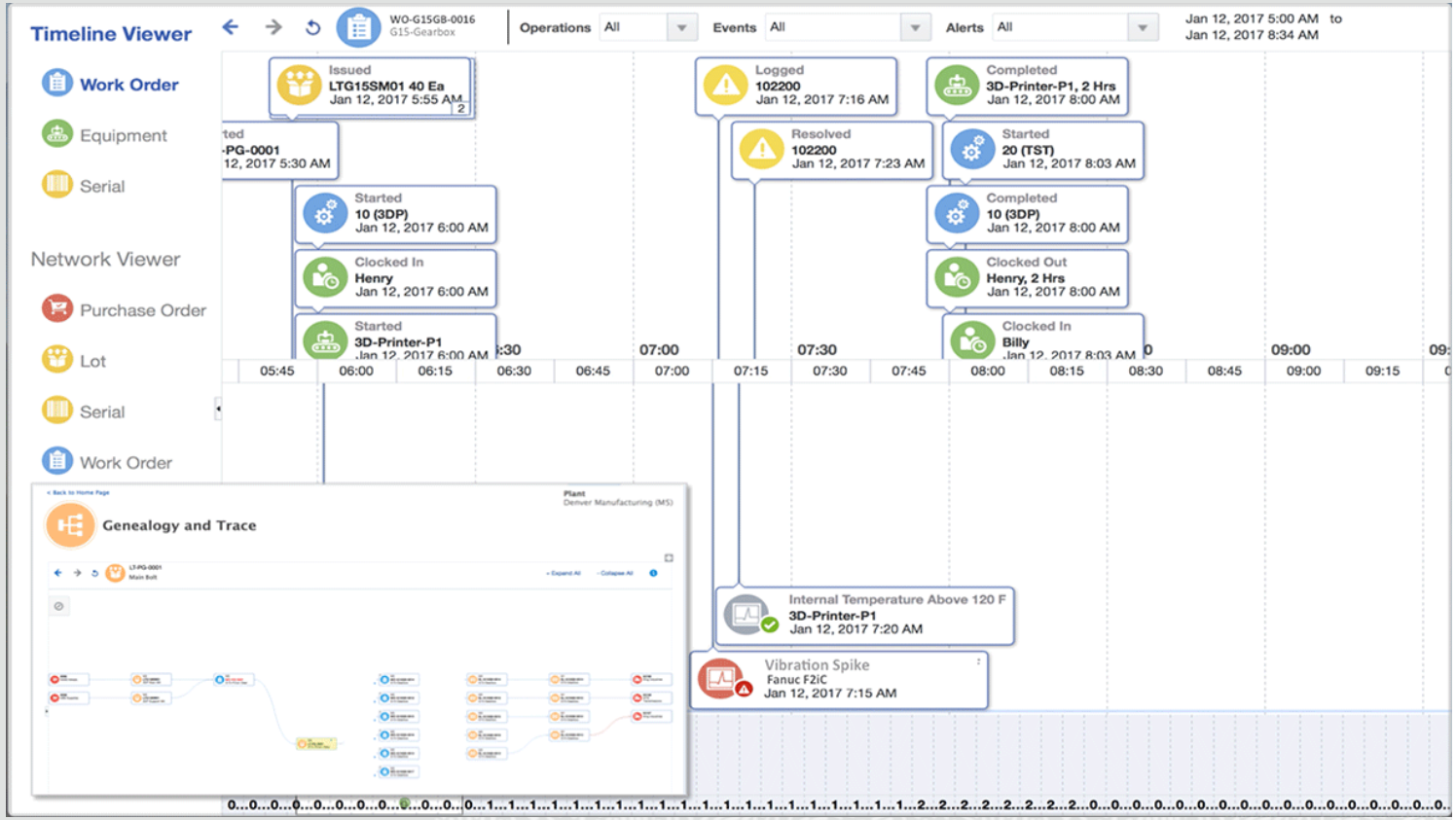
•Using an intuitive, graph-based navigation, traverse back the entire manufacturing process to identify 5M-related information.

Time-Window Traceability

•For any window of time, view all relevant manufacturing events such as machine sensor reading anomalies, alarms/alerts, quality test results, and work order start/stop, as well as status changes such as released and on hold.

Impacted Products and Customers

•Trace forward from any combination of manufacturing factors to identify products made under those conditions and the impacted customers.



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