Outcomes based Solutions powered by IoT

Nigel Clark
Global Digital Solutions Lead
Emerging Technologies,
Industry Solutions Group
nigel.clark@oracle.com

ORACLE

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. | Confidential – Oracle Internal/Restricted/Highly Restricted

Modern Higher Education Enterprise Cloud

Administration | Student | Research | Information Technology

Adaptive Intelligent Apps | Internet of Things | Chatbots | Blockchain

Student Lifecycle Management | Human Capital Management | ERP and Planning & Budgeting

Secure, Connected Cloud Platform and Infrastructure

Storage & Compute | Social, Mobile & Integrations | Analytics & Big Data | Security & Management

ORACLE

Copyright © 2017, Oracle and/or its affiliates. All rights reserved.

Internet of Things Applications

50
Billion devices by 2018

8
Zeta bytes of data today

$3
Trillion market by 2020

IoT is at the top of the Hype Cycle

Yet, IoT is hard
1. Lack of clarity
2. Where do I start?
3. Ambiguous ROI

Our Goal: Make IoT Easy to Drive Business Outcomes

Business Outcomes
(Impact business processes through IoT data from connected assets)

1 – 2 – 3
(Get there with simple steps)

Get Smart
(Predictive, machine learning algorithms)

Automate
(Integrate with business applications)

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

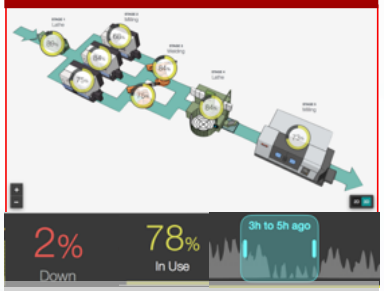
Oracle IoT Cloud Applications & Industry Solutions

Monitor assets, their health, utilization & availability

Asset Monitoring

Manufacturing equipment & production line monitoring & prognostics

Production Monitoring

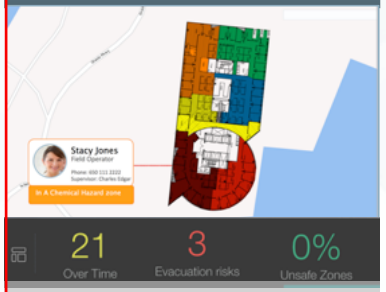


Monitor shipments, fleet vehicles, driver behavior and costs

Fleet Monitoring

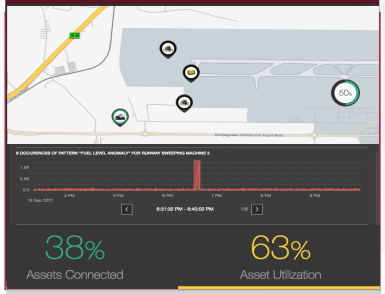
Enhance worker safety through monitoring of workers and environment

Connected Worker



Automate asset monitoring and customer service to enhance customer experience

Service Monitoring for Connected Assets



Internet of Things Cloud Enterprise (Platform)

Connect | Analyze | Integrate | Learn

Available

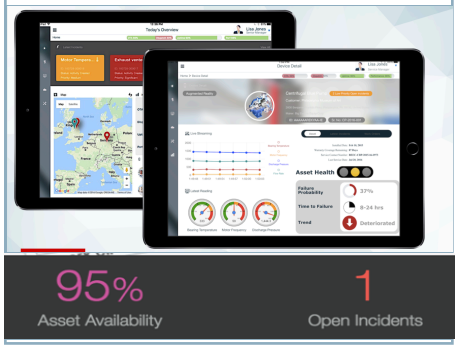
ORACLE

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

How do we extend Customer Experience applications to deliver a new value driven solution for our customers?

X-Industry

Digital Field Service B2C & B2B



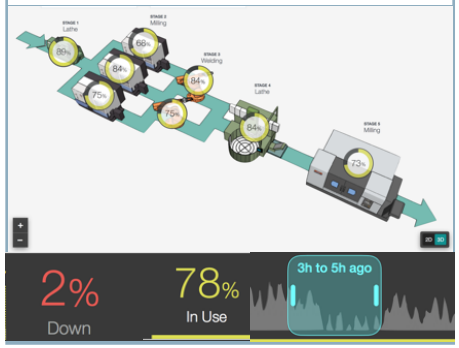
B2C: Service Cloud
Field Service Cloud

B2B: Engagement Cloud
Field Service Cloud

IoT Asset Monitoring

Industry X.0

Smart Connected Factory

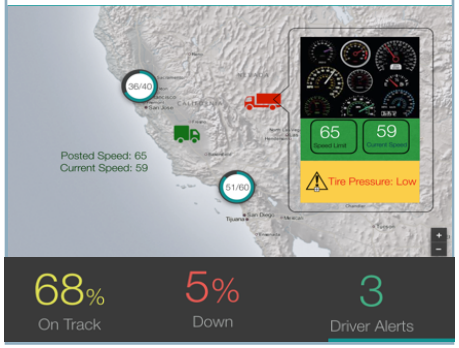


Supply Chain Mgmt Cloud
ERP Cloud

IoT Product Monitoring

X-Industry

Digital Fleet Management



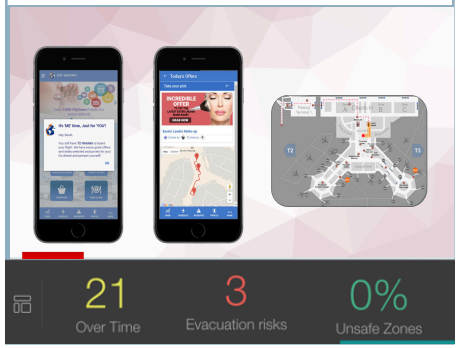
Logistics: Logistics Cloud

Fleets: Service Cloud
Field Service Cloud

IoT Fleet Monitoring

X-Industry

Digital Spaces Monetization

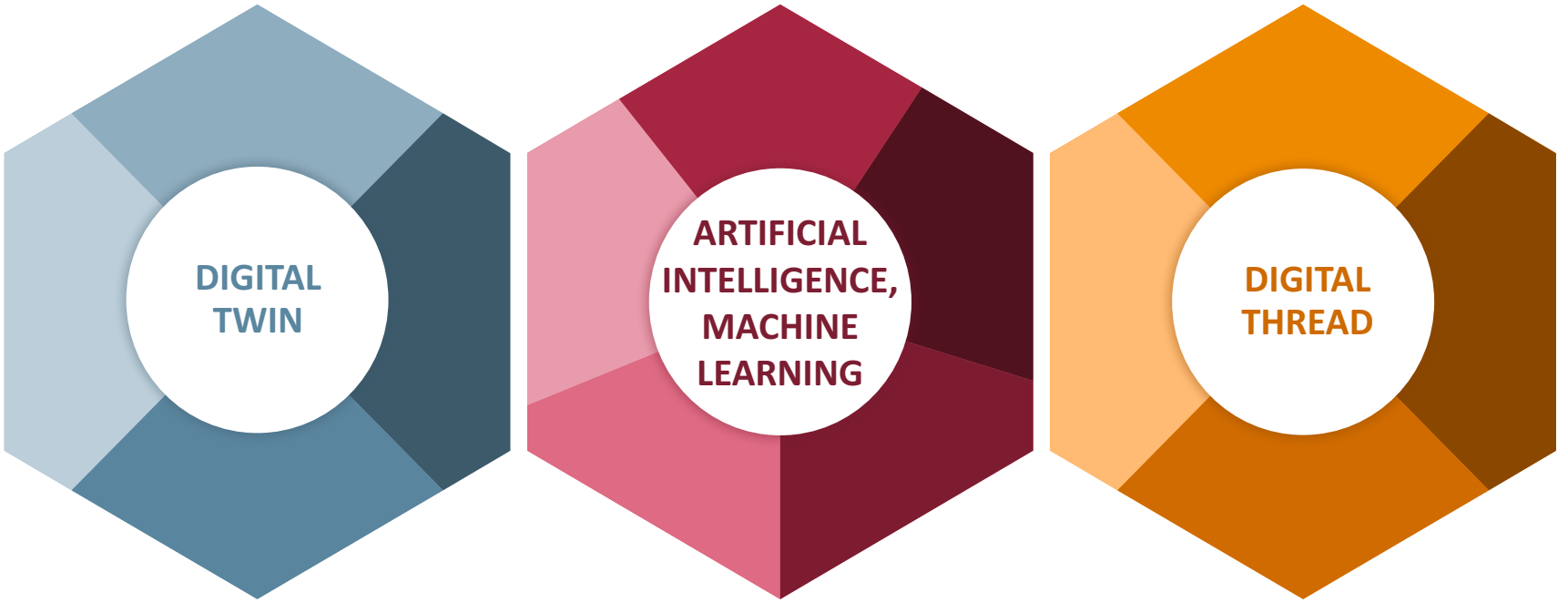


Marketing Cloud

IoT Cloud
Mobility Cloud

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

The Future of Applied IoT for Manufacturing

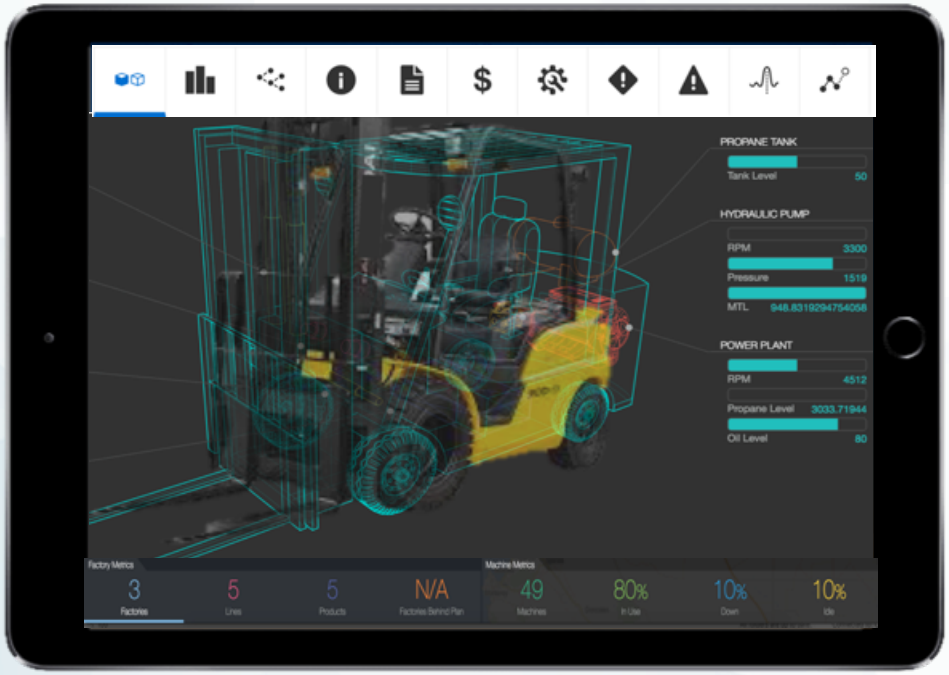


Copyright © 2017, Oracle and/or its affiliates. All rights reserved. | Confidential – Oracle Internal/Restricted/Highly Restricted

Digital Twin

Simplify Interaction with Physical Assets

Digital Twin: IoT made Simple



Visibility & Digital Interaction model

Single pane of glass – 360 degree view of assets

- KPIs
- Incidents
- Maintenance
- Financials

Business Context, Hierarchical, Relationships

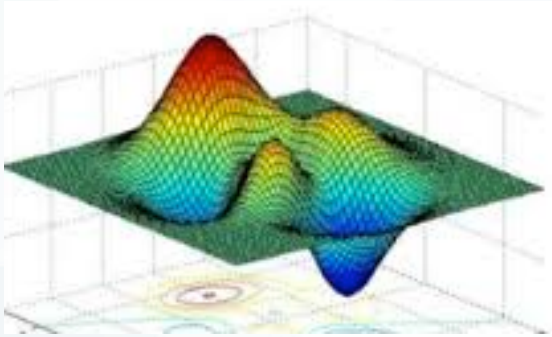
- View the asset in the context of the business processes, and relate it to other assets and hierarchies

ORACLE

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

AI & Machine Learning

Applied ML and Specialized Time-series Algorithms



Analytics models
Predictions
Logistic regression
Symbolic Aggregate approXimation
Support Vector Machine
Random Forest
BAYESIAN NETWORK
Correlation Analysis
Decision Tree
Linear regression
Grubb's test
Kernel Density Estimation

Operational Analytics
- Detect anomalies
- Predict failures

Specialized time series algorithms to analyze IoT data.

Automatic model creation and tuning

Predictive models using IoT data + Business data (Manufacturing, Maintenance, Service, Logistics, Warehouse, Financial, ERP data)

ORACLE

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

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

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

Digital Field Service
Leveraging IoT Asset Monitoring

ORACLE

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. | Confidential – Oracle Internal/Restricted/Highly Restricted

DID YOU KNOW?

Power By The Hour

Rolls-Royce paid for “continuous uptime,” rather than revenue from turning wrenches during aircraft downtime

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

Inefficiencies Plague Current Approaches

Manual

70%

Businesses rely on **manual techniques to locate & track** assets

#1

Reason for unplanned asset write-offs is **inability to locate them**

Reactive

25%

Of service calls require **repeat visits**

30%

Of customers demand **more predictive and proactive services**

Costly

76%

Of Field Service Orgs are **struggling to achieve profitability**

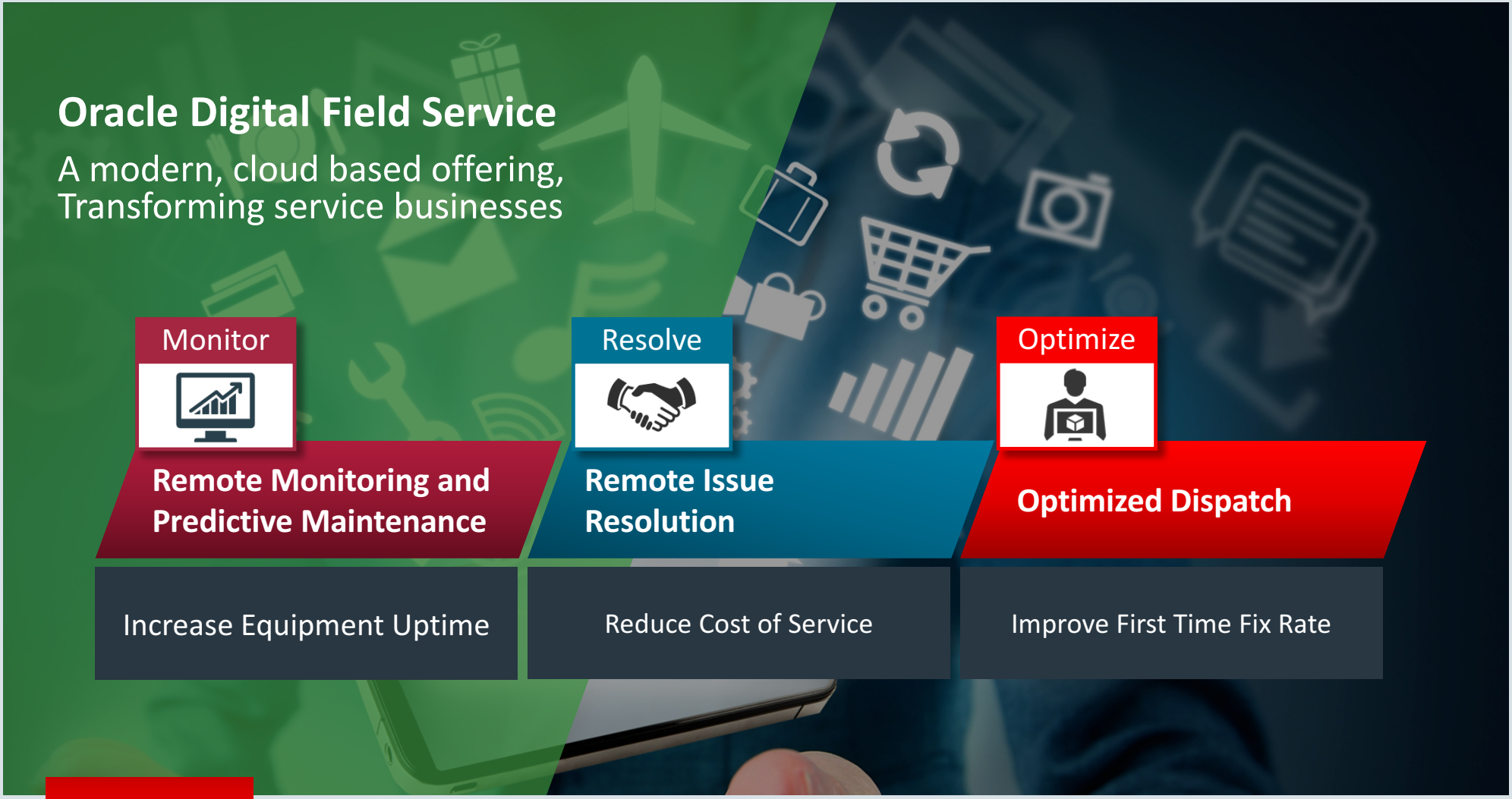
25%

Of total operating costs of a typical mfg company is for **asset maintenance**

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

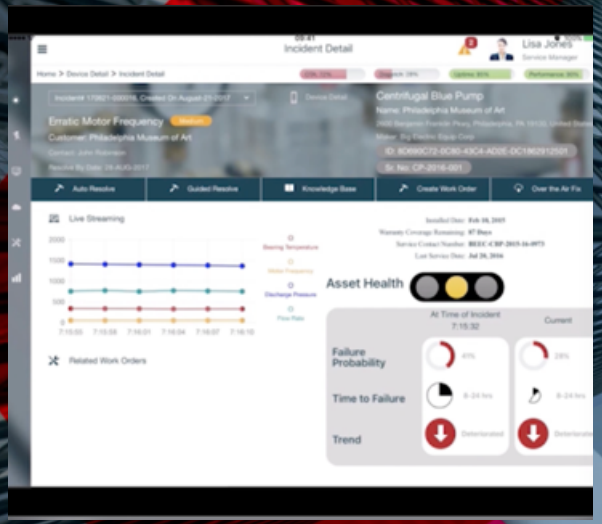
Oracle Digital Field Service

A modern, cloud based offering,
Transforming service businesses



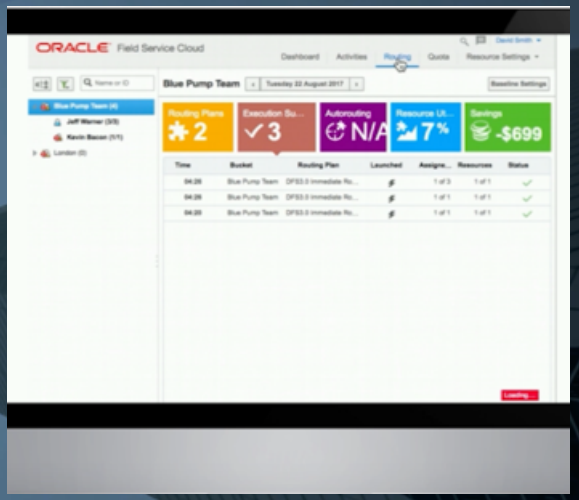
Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

Digital Field Service: Demonstration



Real-Time Predictive Analytics with integration to Service Cloud & IoT Asset Monitoring

Asset Simulator
Digital Twin of Connected Asset



Oracle Field Service Cloud

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. | Confidential – Oracle Internal/Restricted/Highly Restricted

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. | Confidential – Oracle Internal/Restricted/Highly Restricted

Smart Connected Factory (City, Campus…)
Leveraging IoT Production Monitoring

ORACLE

Manufacturing Industries are Experiencing Considerable Disruption

- **Consumer demand volatility** is changing manufacturing processes.
- **Market competition** is constantly putting pressure on Executive decisions.
- **New digital business models** are disrupting manufacturing companies.
- **We are only at the beginning** of the 4th industrial revolution.

ORACLE

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

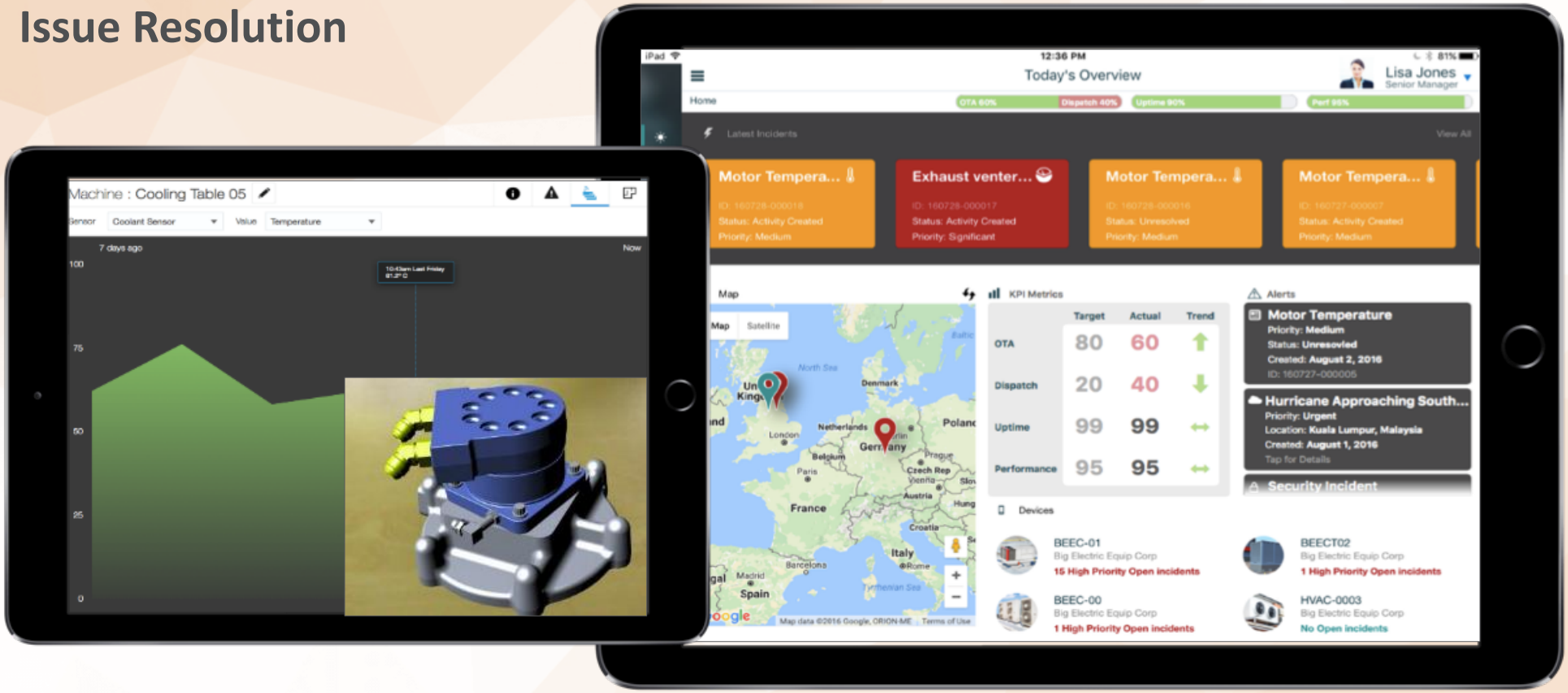
Connected & Disconnected Factories Monitoring

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

Production Monitoring & Predictive Maintenance

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

Asset Monitoring and Predictive Issue Resolution



Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

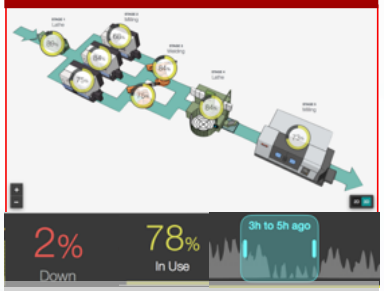
Oracle IoT Cloud Applications & Industry Solutions

Monitor assets, their health, utilization & availability

Asset Monitoring

Manufacturing equipment & production line monitoring & prognostics

Production Monitoring

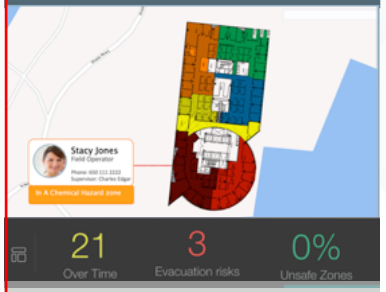


Monitor shipments, fleet vehicles, driver behavior and costs

Fleet Monitoring

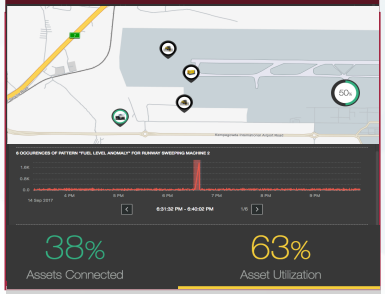
Enhance worker safety through monitoring of workers and environment

Connected Worker



Automate asset monitoring and customer service to enhance customer experience

Service Monitoring for Connected Assets



Internet of Things Cloud Enterprise (Platform)

Connect | Analyze | Integrate | Learn

Available

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

ORACLE®