OSIsoft + Microsoft collaborate to rapidly operationalize IoT Analytics initiatives

Presented by
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Microsoft

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Agenda

- Time to start Digital Transformation
- Digital Transformation and IoT Analytics
- Microsoft and OSIsoft introduce RCIP

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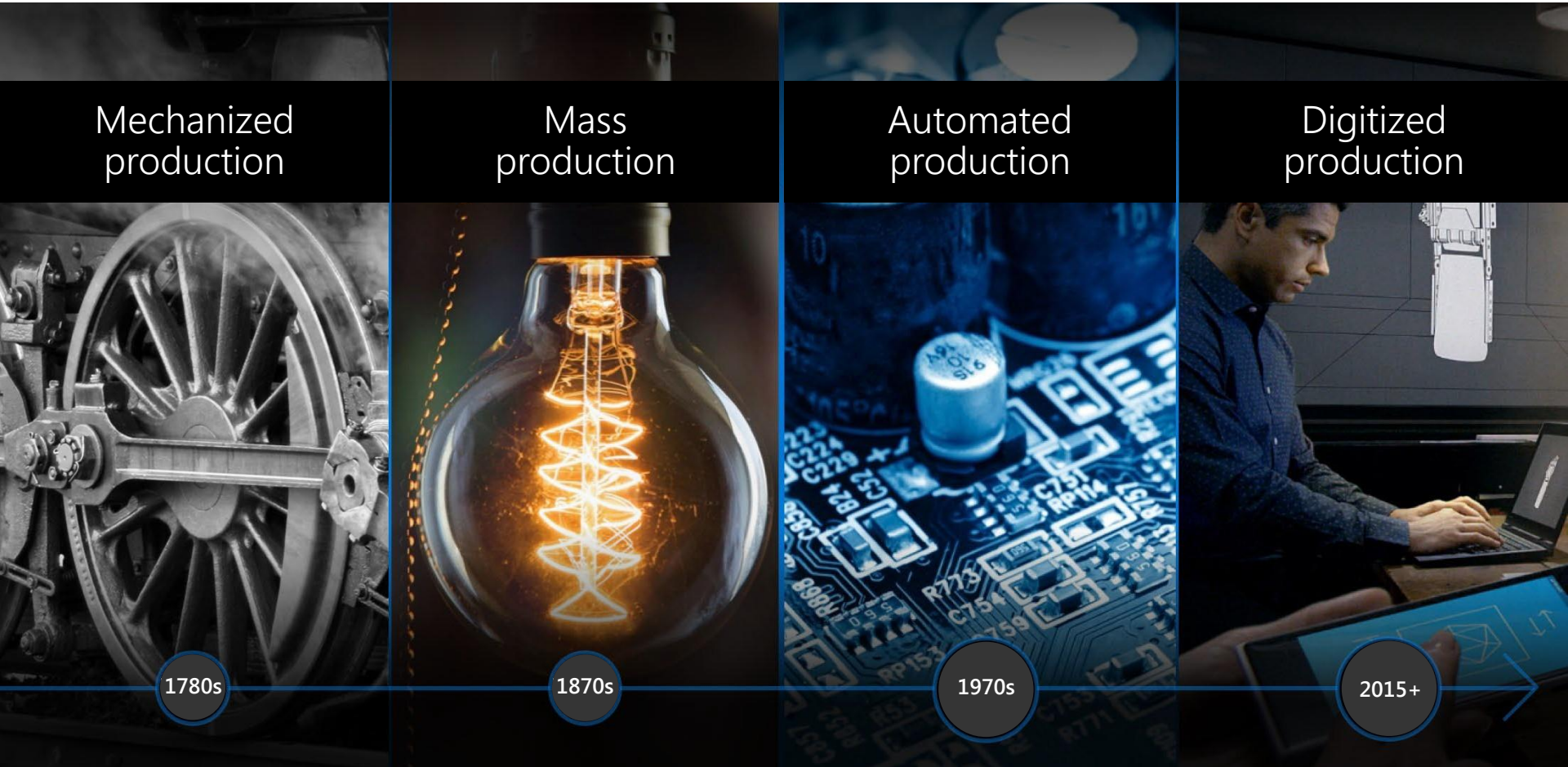
Digital Disruption and the 4th Industrial Revolution



30% simultaneous revenue increase and cost reduction for Industry 4.0 first movers by 2020, compared to only 2.9% p.a. and 3.6% p.a. respectively for the average company.[3]

"Consumers will ultimately choose the winners and losers among the companies and brands vying to deliver convenient, low-cost and customized mobility solutions."[4]

40% of operational processes will be self-healing and self-learning by 2022.[2]

Within 3 to 5 years, hundreds of millions of things will be represented by digital twins.[1]

85% of manufacturing executives expect human-machine-centric environments to be commonplace by 2020.[5]

95% of business leaders expect their company to use the IIoT within the next three years."[8]

$500b potential in savings for manufacturers and equipment makers from virtualization, real-time communication, and cobot technology.[7]

This infographic is based on Microsoft analysis of third-party data. Sources include: 1. http://www.gartner.com/newsroom/id/3482617 2. IDC FutureScape: Worldwide Digital Transformation 2017 Predictions Jan 2017 Doc # US42259317 Web Conference By: Michael Versace. 3 PWC 2016 Global Industry 4.0 Survey; Dr. Reinhard Geissbauer, Jesper Vedso and Stefan Schrauf. 4. What's ahead for fully autonomous driving: Consumer opinions on advanced vehicle technology. Deloitte. February 2017. . 5. Eric Schaeffer et al., Machine Dreams: Making the most of the connected industrial workforce. Accenture. February, 2017. 6. Accenture Strategy: Digital Factory, Cracking the code. to success Russ Rasmus and Jason Nichols, 2016. 7. Daniela Costa, Head, European Capital Goods Equity Research, Goldman Sachs Research; Forrester Research. January, 2017. 8. (Connected business transformation: how to unlock value from the Industrial Internet of Things. Accenture. February, 2017.)

Companies start the Digital Transformation now

Companies that are adapting to a digital world are 26% more profitable than their industry peers [1]

What is the problem?

- People / Culture / Collaboration
- Adoption of a proper technology
- Identify and address relevant use cases quickly
- Manage the risk

[1] MIT Sloan research http://www.leadingdigitalbook.com/

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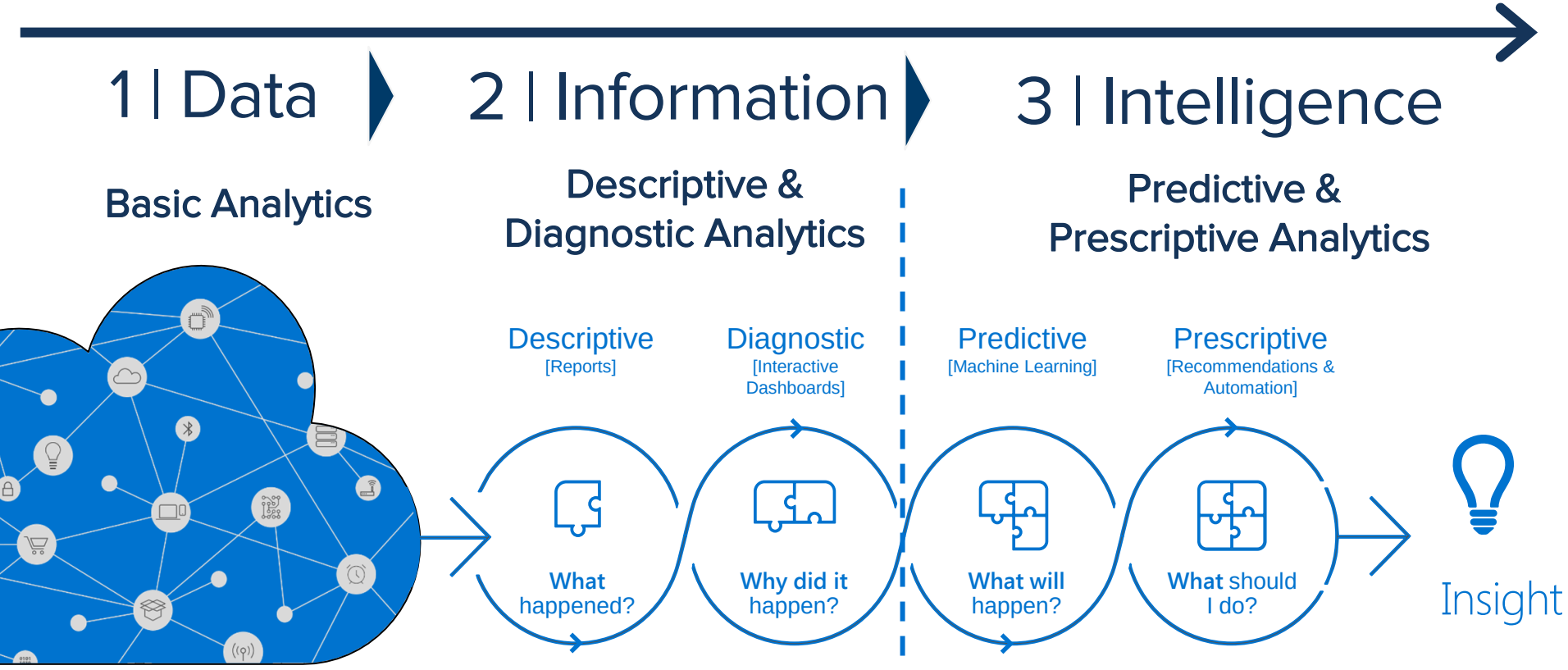
Digital Transformation and IoT Analytics



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Adoption of proper technology

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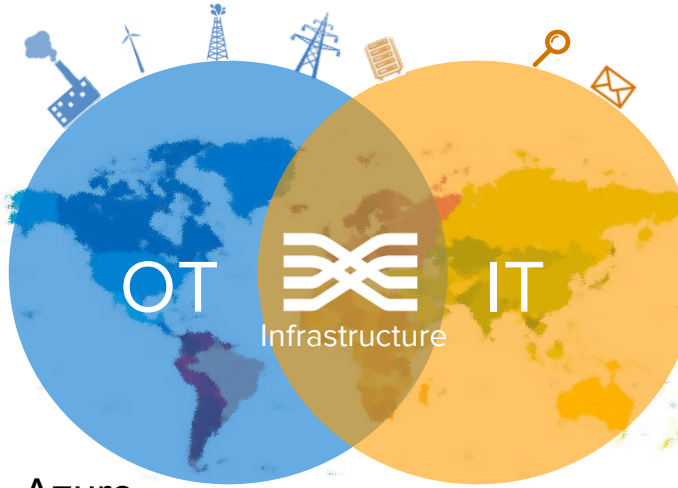
OSIsoft and Microsoft created RCIP to address IoT Analytics

OSIsoft

delivers an **open enterprise infrastructure**, to connect **sensor-based data**, **systems and people** for operational real-time insights that empower companies to optimize and transform their business.



Microsoft

Microsoft's Cloud Platform, which includes Cortana Intelligence, Azure IoT, Power BI and the PI Integrator for Microsoft Azure, is a **recognized premier platform for Cloud AI and Big Data analytics**.

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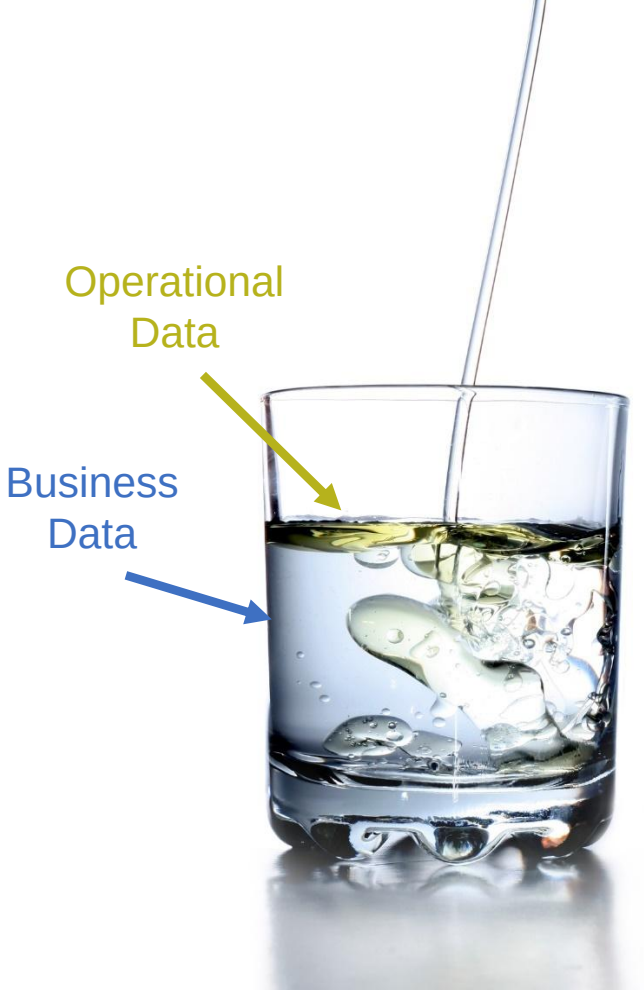
Red Carpet Incubation Program (RCIP)

The Red Carpet Incubation Program (RCIP) is a comprehensive collaboration between OSIsoft and Microsoft to accelerate *operationalization* of IoT analytics using a business-oriented agile incubation process.



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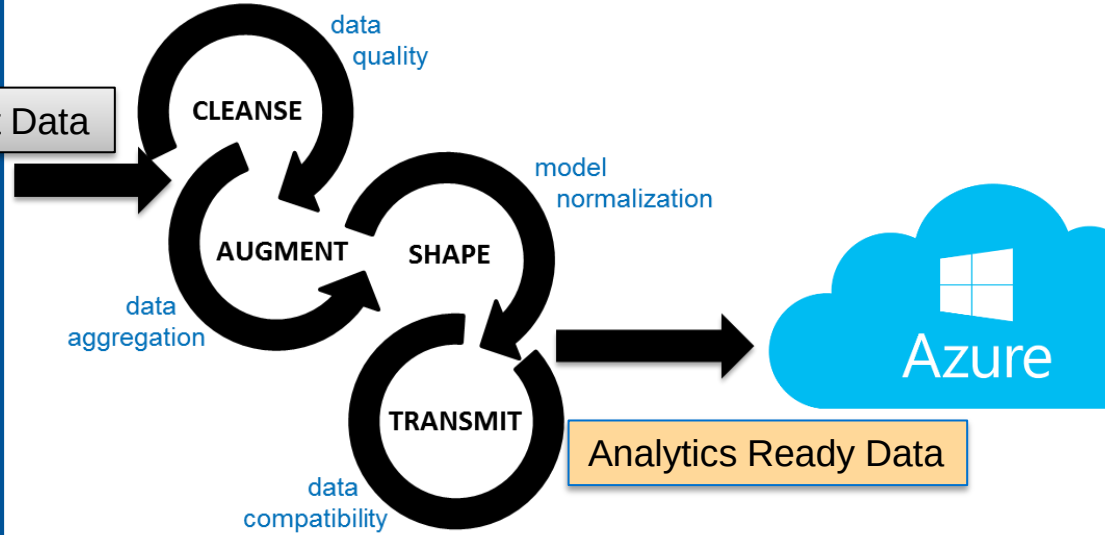
"Data scientists spend up to 80 percent of their time wrestling with the data rather than generating new business insights."

—NEW YORK TIMES

PI Integrator for MS Azure provides Analytics-Ready

Data | Context | Events via C-A-S-T



80% WASTED TIME

Analysts spend vast majority of time preparing data, not analyzing data.

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Identify relevant use cases

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Leveraging the PI System and Cortana Intelligence to Increase Process Efficiency

COMPANY and GOAL

Deschutes Brewery is the 7th largest craft brewery in US, and wanted to maximize production with its existing infrastructure to fund construction of a third brewery in Roanoke, VA

CHALLENGE

Batch's phase transition happens between manual density measurements occurring every 8-10h

- Impact: Losing up to 72H in production time

SOLUTION

Use data science to achieve accurate predictive analytics for determining a batch's density measurements

- PI System
- PI Integrator for Microsoft Azure
- SQL Data Warehouse
- Azure Machine Learning
- Azure Data Factory

RESULTS

Ability to eliminate production time losses and increase production capacity

- Accurate predictions of when a batch's phase transitions from fermentation to free rise

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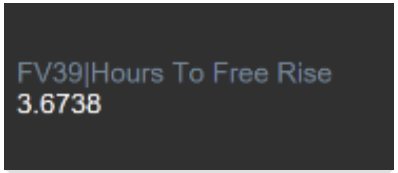
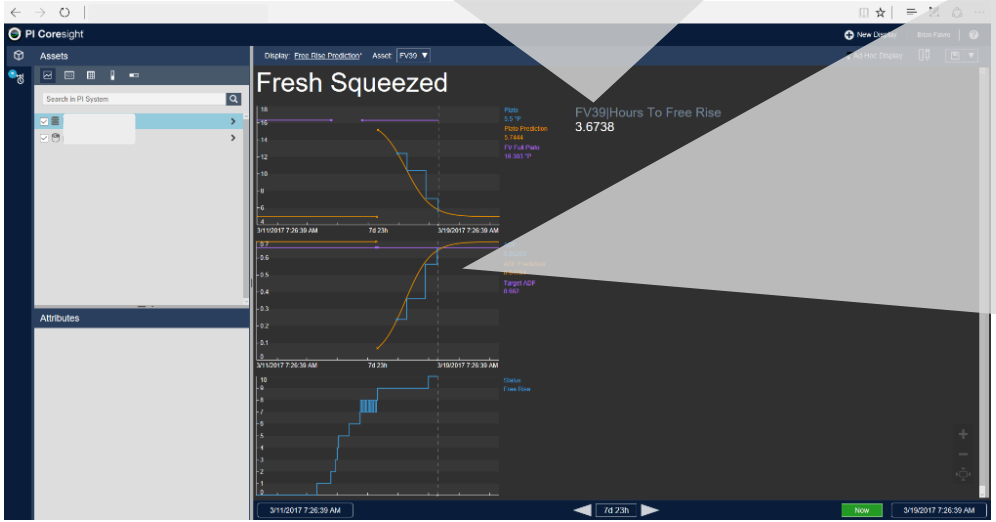
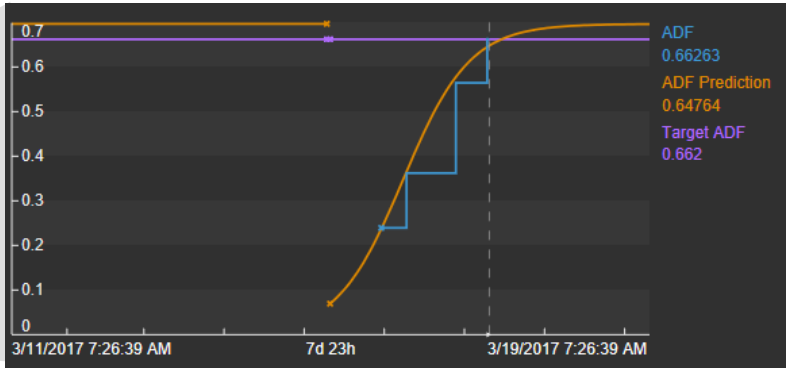
Predicting the transition is a low-cost, accurate option



Indicate when transition happens





Use experience & predictions to ensure high quality beer

https://enterprise.microsoft.com/en-us/customer-story/industries/hospitality-and-transportation/osisoft-deschutes-brewery-used-project-springfield/

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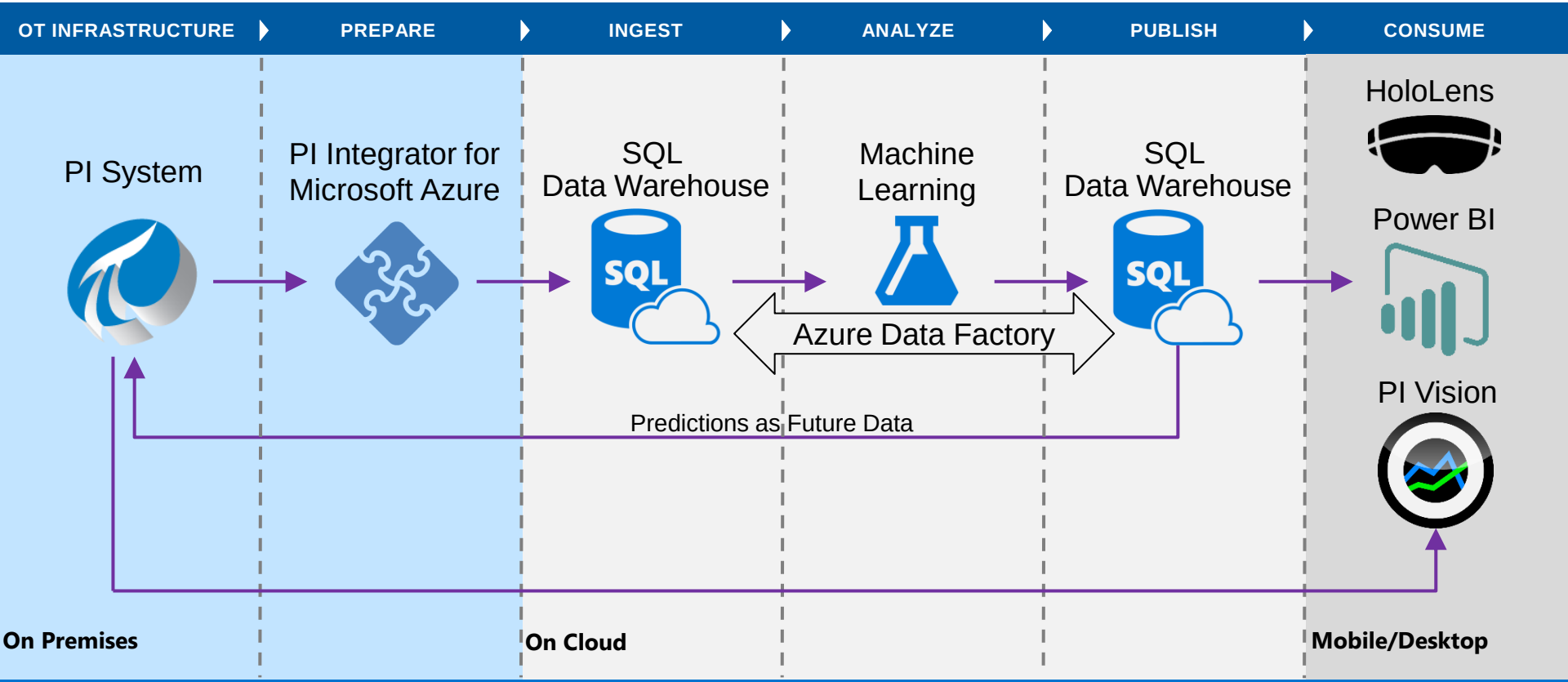
OSIsoft PI System and Microsoft Azure Integration



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Mining Fleet Predictive Maintenance

Barrick Gold

RCIP engagement provided the site with access to vehicle data like never before. Site was totally dependent on the vendor information, but now has access to data in a useful, meaningful manner. The site is now in the cutting edge of maintenance with Predictive models that detect engine failures before they occur.

David Luque, Control Engineer

CHALLENGES

Maintain large fleet of mining trucks with limited access to data

Site dependent on vendor to provide truck information

SOLUTION

RCIP team provided PI System connectivity to ingest VIMS data, develop PI AF models, and create analytics to detect over 60 different type of events

PII4MA published Asset and EF views, which are integrated with ERP, Dispatch, and maintenance data

Barrick and McKinsey developed PowerBI reports and Predictive models for inclusion in Barrick's newly-developed asset health software application

RESULTS

PowerBI reports providing detailed information on fleet performance, maintenance, and reliability

Predictive models to detect probability of engine component failure in the next 5 days

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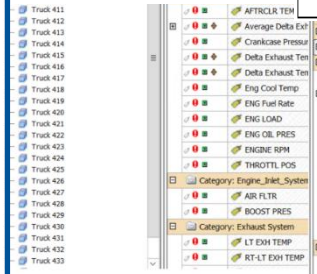
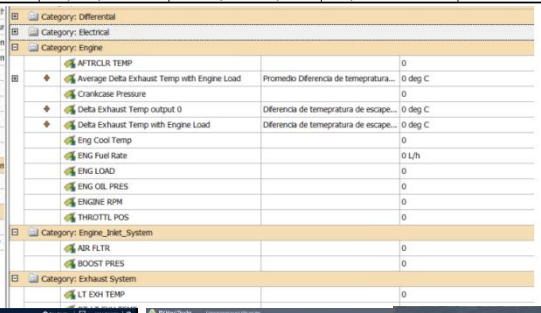
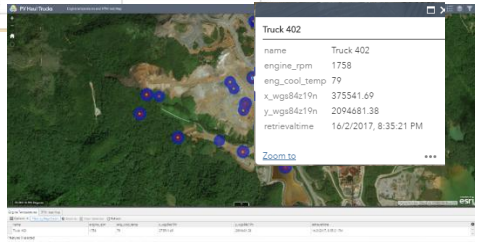
System	Description	Condition	Expected Values	Trigger Action 1	Trigger Action 2
Engine	Delta (RT-LT) Exhaust Temperature	Engine Load >95%			
	Trend Engine Coolant Temperature	Engine RPM > 700			
	After Cooler Temperature	Engine RPM > 700			
	Trend Engine Oil Temperature	Engine RPM > 700			
	Crank Case Pressure	Engine RPM > 700			
	Trend Engine Oil Pressure	Engine at High Idle (1750 RPM			
	Trend Engine Oil Pressure	Engine at Low Idle (700 RPM)			
	Trend Boost Pressure	Engine Load >95%			

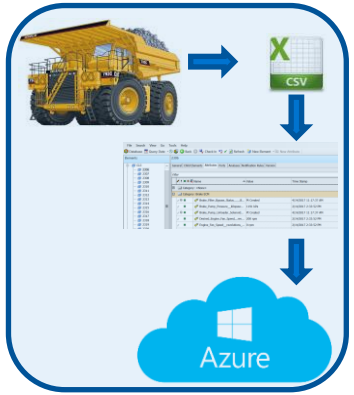
System	Description	Condition	Expected Values	Trigger Action 1
Suspension System	Left Front Suspension Cylinder Pressure	Traveling Empty; Payload < 30 Tn; & Ground Speed > 15 km/h	2820 < Pressure < 3100 kPa	Pressure Trending at ± 20% of limits for more than 7 dayas
	Right Front Suspension Cylinder Pressure	Traveling Empty; Payload < 30 Tn; & Ground Speed > 15 km/h	2820 < Pressure < 3100 kPa	Pressure Trending at ± 20% of limits for more than 7 dayas
	Front Suspension Cylinder Delta (RT - LT)	Traveling Empty; Payload < 30 Tn; & Ground Speed > 15 km/h	ΔP stays within ± 375 kPa	ΔP > ± 375 kPa in the last 14 days
	Left Rear Suspension Cylinder Pressure	Traveling Empty; Payload < 30 Tn; & Ground Speed > 15 km/h	1710 < Pressure < 1990 kPa	Pressure Trending at ± 20% of limits for more than 7 dayas
	Right Rear Suspension Cylinder Pressure	Traveling Empty; Payload < 30 Tn; & Ground Speed > 15 km/h	1710 < Pressure < 1990 kPa	Pressure Trending at ± 20% of limits for more than 7 dayas
	Rear Suspension Cylinder Delta (RT - LT)	Traveling Empty; Payload < 30 Tn; & Ground Speed > 15 km/h	ΔP stays within ± 375 kPa	ΔP > ± 375 kPa in the last 14 days

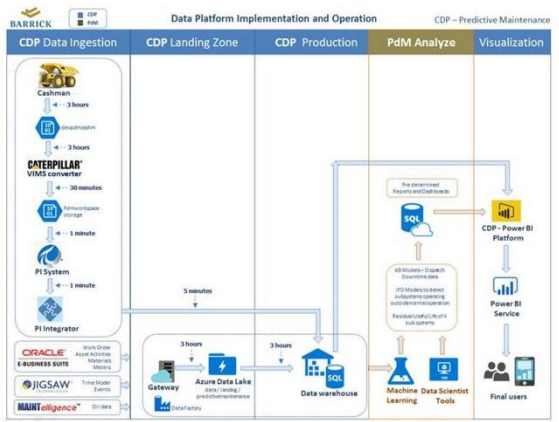


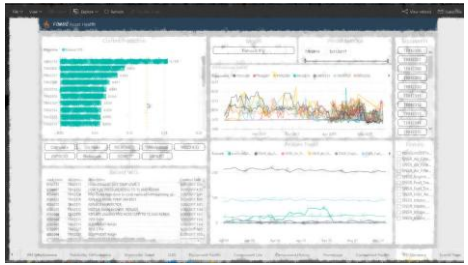


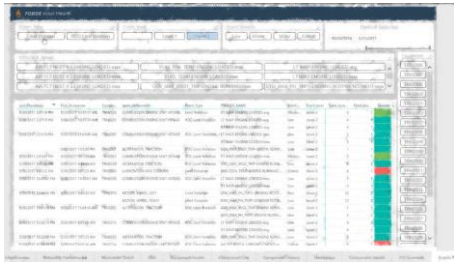


- AF Workshop focused on Exhaust and Suspension Systems
- Project grew to include all truck Systems
- integration with CMMS for automated WO generation
- Integration with ESRI
- Presented at SF UC 2017









- Worked with large Barrick-sponsored team involving Microsoft, McKinsey, OSIsoft
- RCIP participation to create ML models based on VIMS data
- Event and time-series data fed to DW via PII4MA
- Focused on detecting probability of major component failures

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Use case determines the type of engagement

Microsoft Azure is the cloud technology of choice

RCIP-IoT

- PI System on premise – historical data available
- Utilizing PI Vision and PowerBI for use-cases like Remote Monitoring, Asset Performance Management,...

RCIP-IoT SaaS

- New customer or new site without PI System on premise
- Don’t want to manage / maintain PI System

RCIP-AI

- PI System on premise – 2 years of historical data, with detailed resolution and context available to address e.g. predictive or prescriptive analytics for pump failure predictions

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Manage the risk

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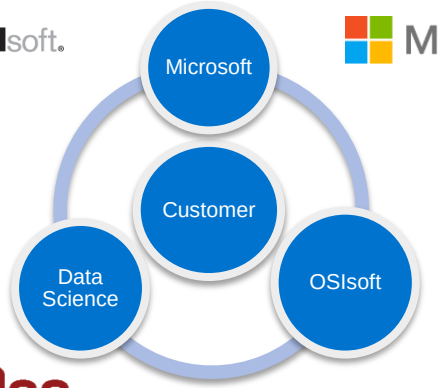
Red Carpet Incubation Program (RCIP)

*"We like the **agile approach of OSIsoft and Microsoft's Red Carpet Incubation Program** for rapid operationalization of advanced analytics, **helping us to harness the potential of digital technology and unlock value across Barrick's business**,"*

said Ed Humphries, Barrick's Head of Digital Transformation.

BARRICK

OSIsoft. Microsoft



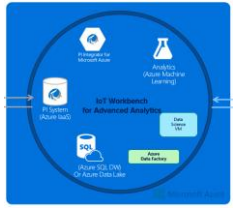
pmOne

NEAL ANALYTICS

FINGER FOOD

PI Integrator for Microsoft Azure (PII4MA)

Red Carpet Incubation Program



IoT Workbench for Advanced Analytics (Azure-based)

Red Carpet Incubation Program Early Adopter Customers

- Craft Brewery (USA)
- Henkel — Chemicals (Germany)
- TOYOTA — Automotive OEM
- MITSUBISHI HITACHI POWER SYSTEMS — Power & Utilities (Japan)
- mpwik WROCŁAW — Water Utilities (Public Sector) - Poland
- BARRICK — Metals & Mining (Canada, USA)

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Key take aways and call to action

RCIP is available today!

OSIsoft and Microsoft together can accelerate your IoT Analytics initiative

Talk to your OSIsoft Account Manager about your digital strategy and IoT Analytics use case

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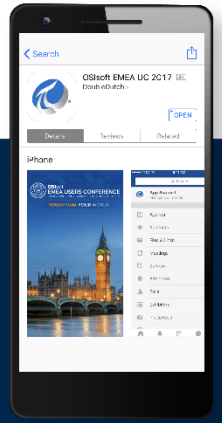
Questions

Please wait for the **microphone** before asking your questions

State your **name & company**

Please remember to…

Complete the Online Survey for this session



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