

The background of the slide is a dark blue gradient with a faint, stylized image of the San Francisco skyline, including the Golden Gate Bridge and the Transamerica Pyramid. The OSIsoft logo is positioned at the top center.

OSIsoft®

USERS CONFERENCE 2016

April 4-8, 2016 | San Francisco

TRANSFORM
YOURWORLD



Using the PI Integrator for Business Analytics (BA) to Operationalize Predictive Analytics with Cortana Intelligence

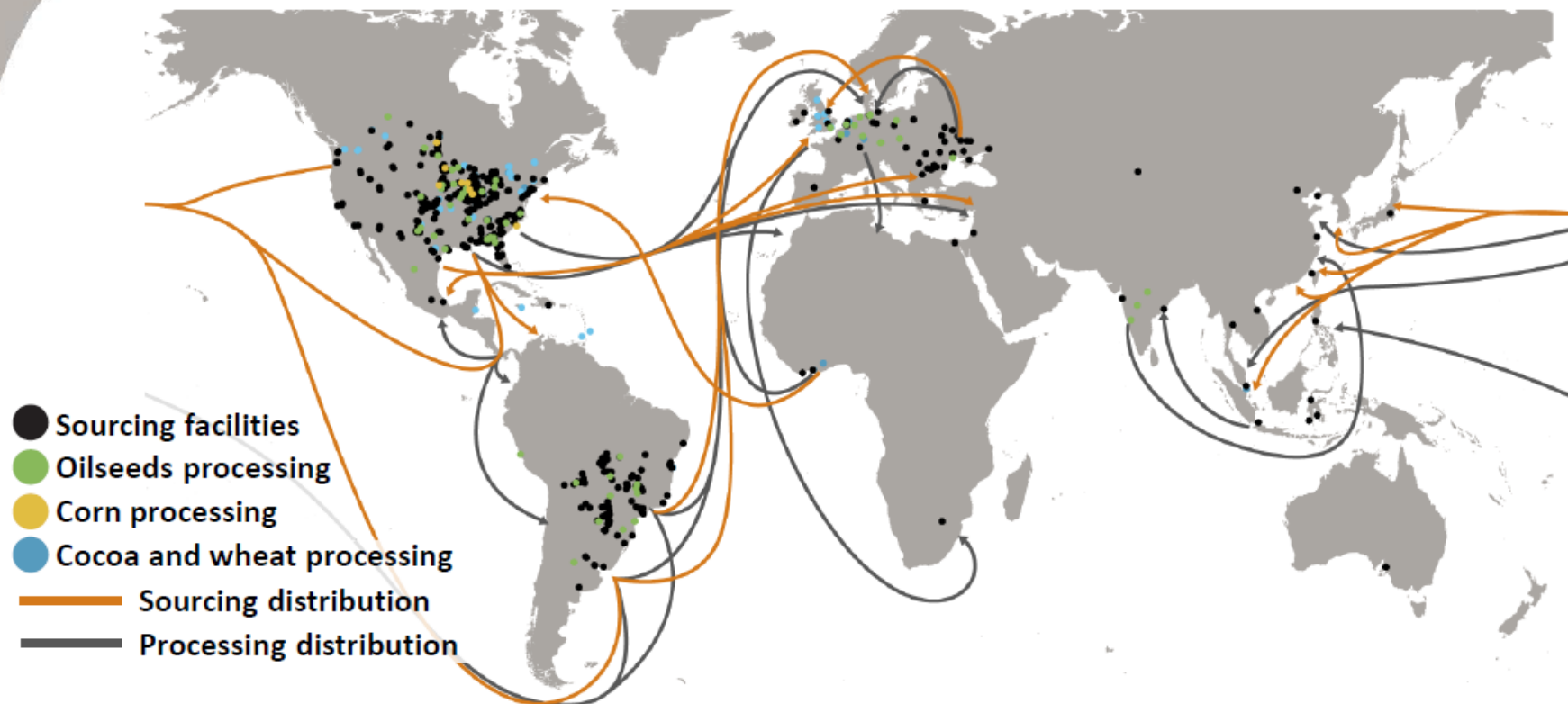
Presented by

Scott Harmeyer – ADM

Priya Sathy – Microsoft

Prabal Acharyya - OSIsoft

Unmatched Assets and Global Scale



The Mechanical Reliability of the Equipment

Abnormal High
Frequency of
Equipment Failure

Cost of Rebuilding
Equipment

Objective

Develop advanced analytics to gain insights into the data



Build Machine Learning Model



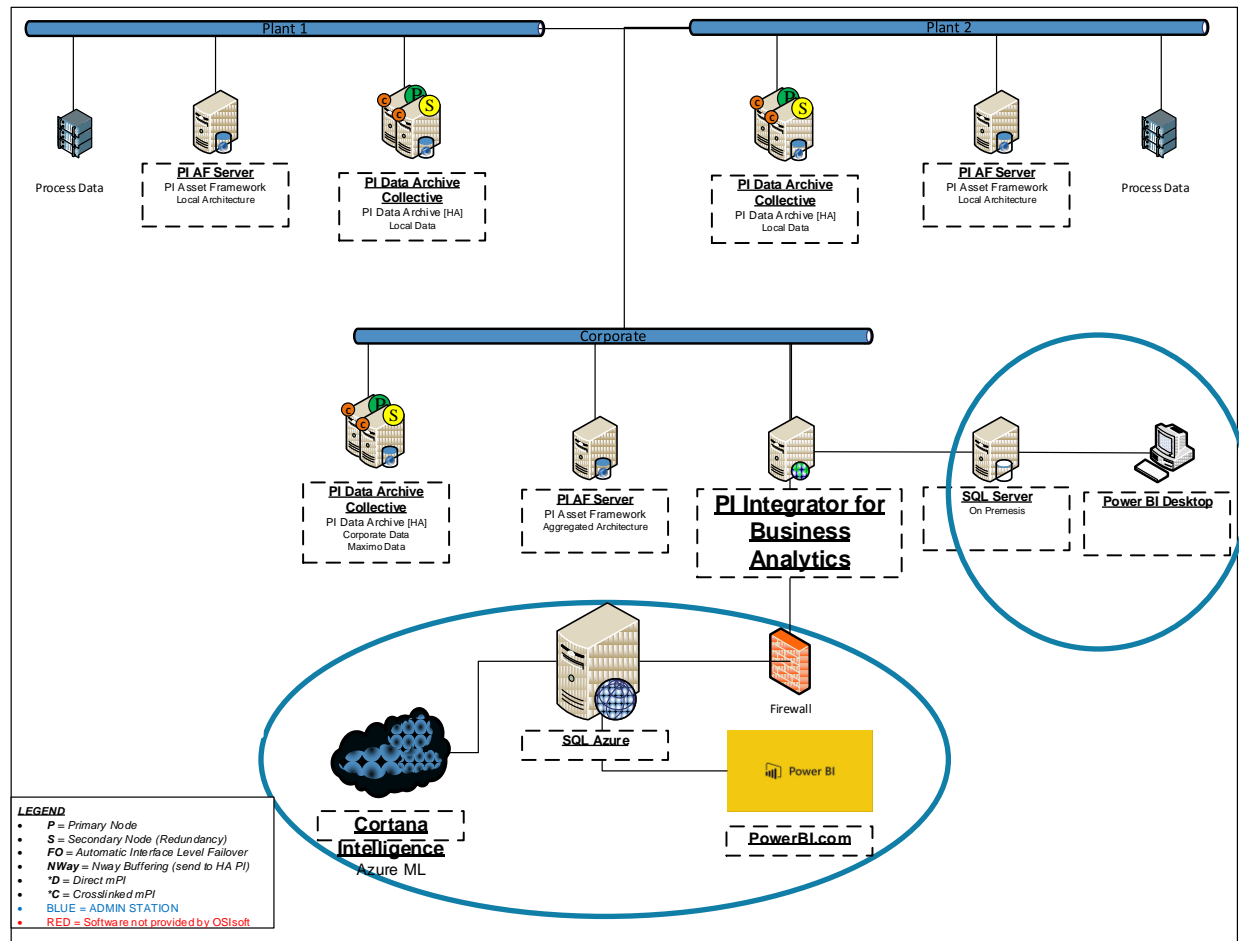
Predict Failures



PI Integrator for BA Decision-Ready Data

Landscape

- Enterprise Agreement
 - Unlimited Tags, CoE and EPM
- Asset Framework
- **OSIsoft Advanced Services**
- PI Integrator for Business Analytics
- Microsoft Power BI
- Cortana Intelligence Azure ML (future)



Why PI Business Integrator for Business Analytics?

- Asset Framework (AF) provides context
 - Data is coming from multiple sources
 - Extremely important
- Data Scientists do not know PI Client tools
- CAST – Cleanse – Augment – Shape - Transmit
- Produces BI and advanced analytics ready data

[Select Data](#) > [Modify View](#) > [Publish](#)

PI Integrator for Business Analytics

[Next](#)

Source Assets

Server

Database

Assets

- GasTran
 - Brownsville
 - Compressor-023
 - Compressor-304
 - Compressor-340
 - Compressor-356
 - Compressor-432

Attributes ☐ Select All

- ☐ Differential Pressure
- ☐ Gas Flow
- ☐ Model
- ☐ Station

Asset Shape

Shapes

- Compressor
 - Differential Pressure
 - Gas Flow
 - Model
 - Station

Matches

Found 29 Matches

- Compressor-023
- Compressor-304
- Compressor-340
- Compressor-356
- Compressor-432
- Compressor-567
- Unit01
- Unit01
- Unit02
- Unit02
- Unit03
- Unit03
- Unit04
- Unit04
- Unit05
- Unit05
- Unit06
- Unit06
- Unit07
- Unit07
- Unit07

Asset
Framework (AF)AF Templates
(OSIsoft Advanced
Services)

PI Integrator for Business Analytics

Select Data

Compressor Analysis				
+ Add Column 6 Columns		▼ Edit Row Filters 0 Row Filters		≡ Edit Value Mode Interpolated Values Every 1 minutes
			Start Time	Saturday, October 1, 2011
Compressor	LocalTime	Differential Pressure	Gas Flow	
Unit01	2011-10-01 00:00:00	93.3822	100.6735	Model A
Unit01	2011-10-01 00:01:00	93.36484	100.6739	Model A
Unit01	2011-10-01 00:02:00	93.34747	100.6742	Model A
Unit01	2011-10-01 00:03:00	93.33011	100.6746	Model A
Unit01	2011-10-01 00:04:00	93.31274	100.675	Model A
Unit01	2011-10-01 00:05:00	93.29539	100.6754	Model A
Unit01	2011-10-01 00:06:00	93.27802	100.6758	Model A
Unit01	2011-10-01 00:07:00	93.26066	100.6761	Model A
Unit01	2011-10-01 00:08:00	93.24329	100.6765	Model A
Unit01	2011-10-01 00:09:00	93.22593	100.6769	Model A
Unit01	2011-10-01 00:10:00	93.20856	100.6772	Model A
Unit01	2011-10-01 00:11:00	93.1912	100.6776	Model A
Unit01	2011-10-01 00:12:00	93.17384	100.678	Model A
Unit01	2011-10-01 00:13:00	93.15647	100.6784	Model A
Unit01	2011-10-01 00:14:00	93.13911	100.6787	Model A

Column Details

Name

Gas Flow

[Reset Name to Default](#)

Data Content ?

Value

Name

Value

Last Recorded Value

Total

Average

Minimum

Maximum

Range

Standard Deviation

Population Standard Deviation

Count

Percent Good

Select Data > Modify View > **Publish**

Target Configuration

PI View

- ☐ Run Once
- ☒ Run on a Schedule

First Run

•

Re

Nov 2015

Su	Mo	Tu	We	Th	Fr	Sa
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

Hour: 00 Minute: 00 Second: 00

Summary

Shape and Matches

- There are **29 Matching Instances**.

Timeframe and Interval

- Your Start Time is **Saturday, October 1, 2011 12:00:00 AM**
- Your End Time is **Tuesday, November 1, 2011 12:00:00 AM**
- Your Time Interval gets an interpolated measurement every **1 minutes**

Publish

**Ad-hoc or
Scheduled
(Streaming)**

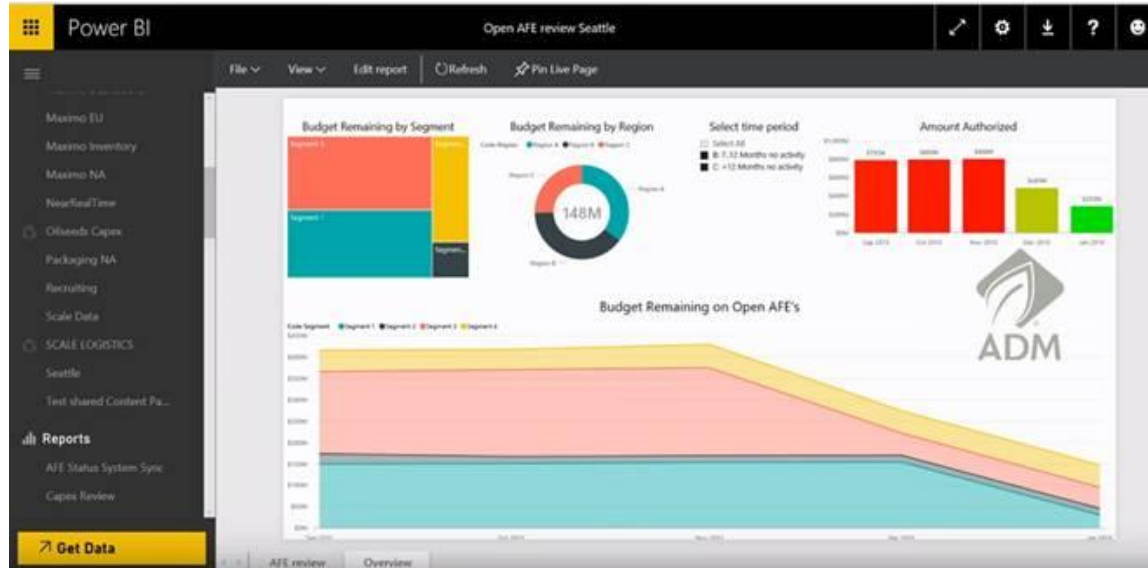


Microsoft®
SQL Server®



Azure
SQL Data Warehouse

Feedback



“We have had more progress in the past 6 months at ADM with operational data via PI System than we have had in past 14 years.”

- Erik Roukens, Manager Operational Excellence, ADM

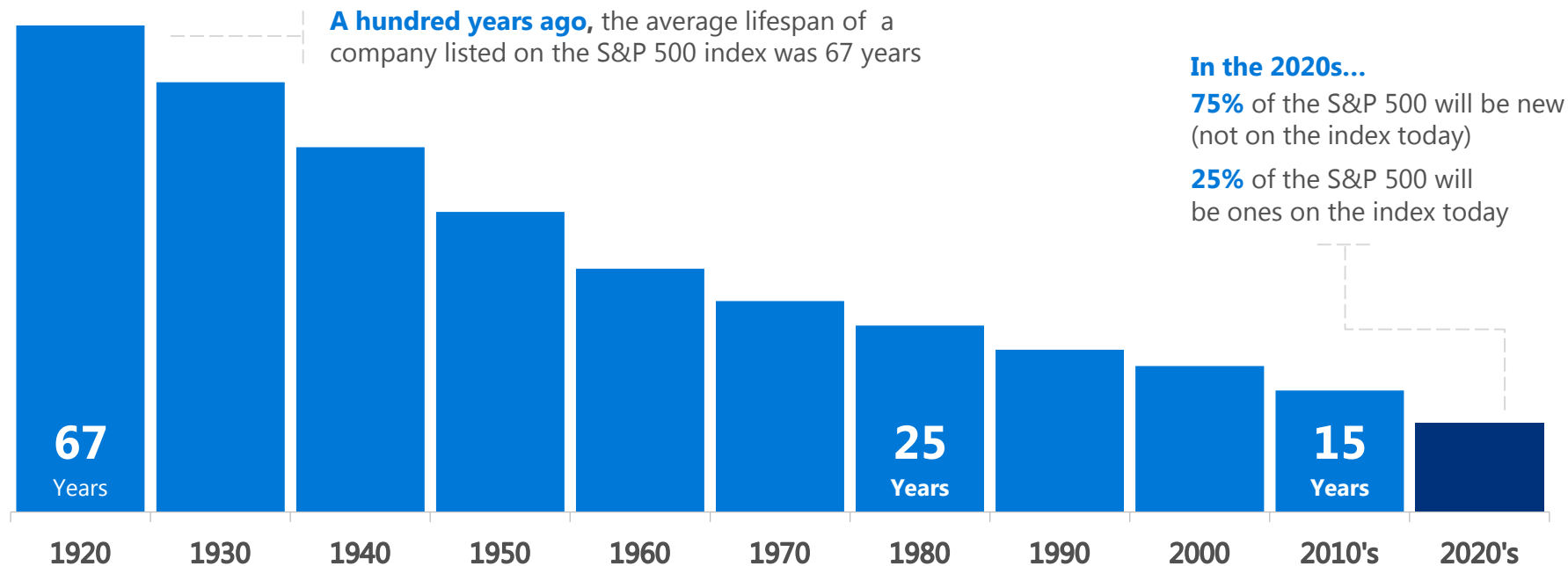


Microsoft

Cortana Intelligence

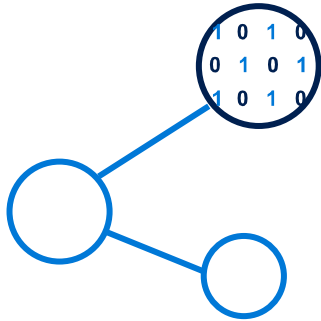
Priya Sathy, Principal Program Manager

The time to adapt to disruptions is shrinking



Source: BBC

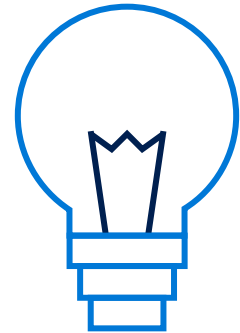
We now face the next disruption –



Big Data

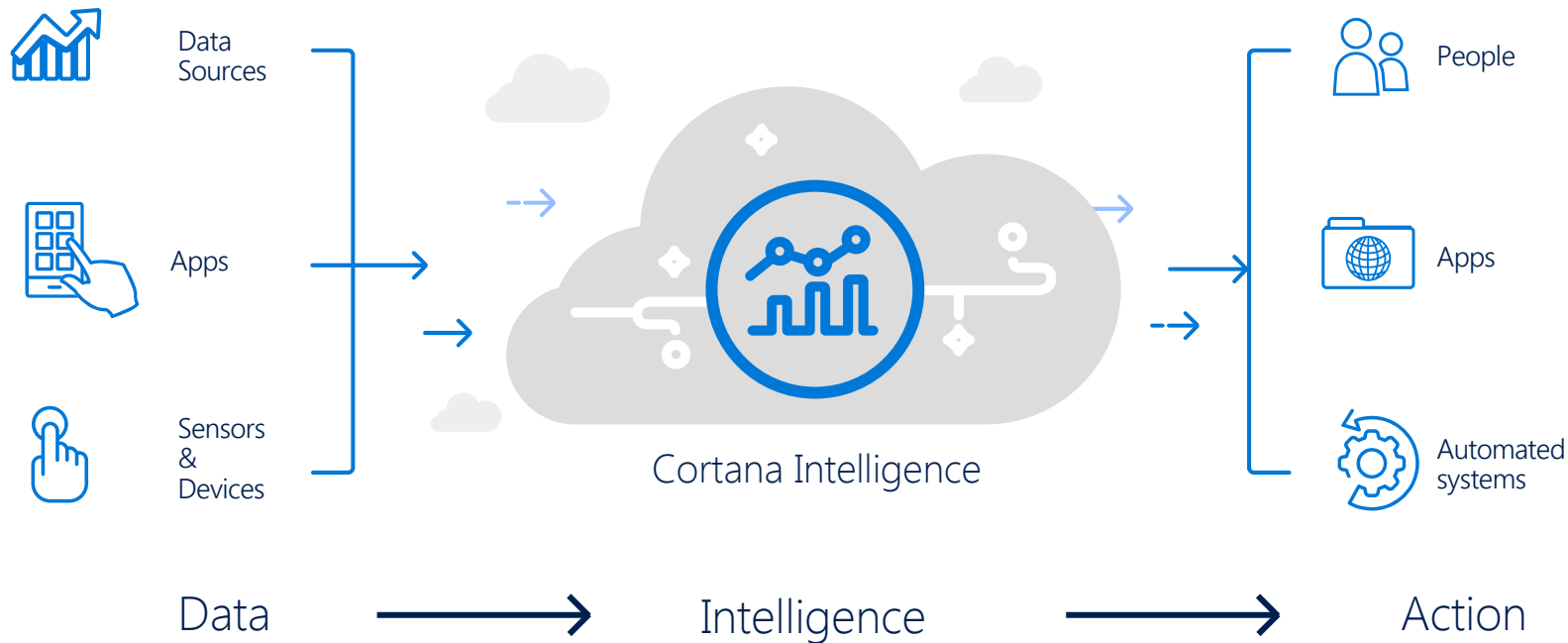


Cloud

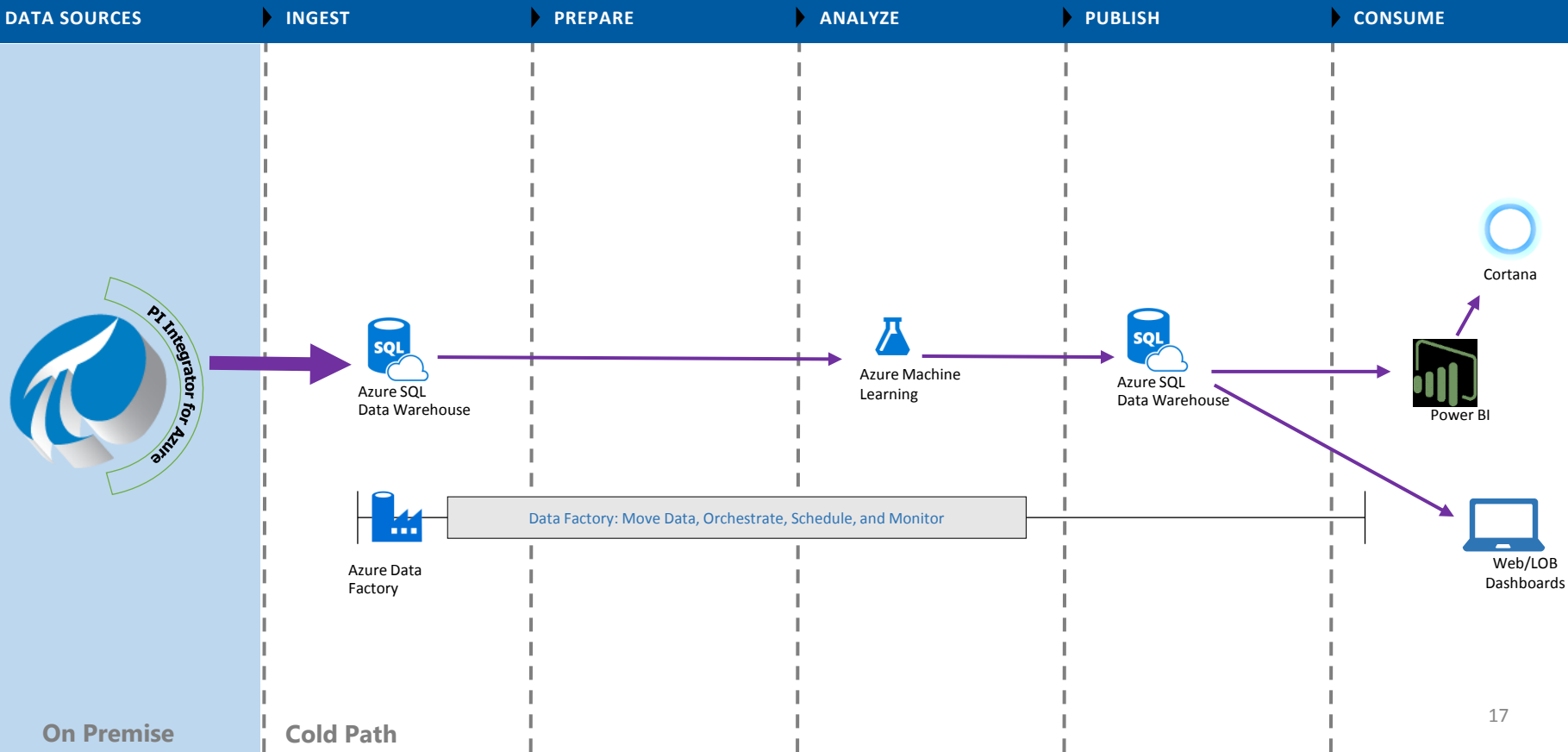


Intelligence

Transform data into intelligent action with Cortana Intelligence



ADM's Architecture for Predictive Maintenance



Azure Machine Learning

Microsoft Azure Machine Learning

Luis Cabrera-Cordon-Free... ?

Experiment created on 2/13/2016

Finished running ✓
Draft saved at 4:02:16 PM

Search experiment items

- Saved Datasets
- Trained Models
- Data Format Conversions
- Data Input and Output
- Data Transformation
- Feature Selection
- Machine Learning
- OpenCV Library Modules
- Python Language Modules
- R Language Modules
- Statistical Functions
- Text Analytics
- Web Service
- Deprecated

Two-Class Neural Network ✓

Adult Census Income Binary...

Split Data ✓

Train Model ✓

Score Model ✓

Evaluate Model ✓

SET UP WEB SERVICE

Properties Project

Two-Class Neural Network

Create trainer mode
Single Parameter

Hidden layer specification
Fully-connected case

Number of hidden no...
100

Learning rate
0.1

Number of learning ite...
100

The initial learning wei...
0.1

The momentum
0

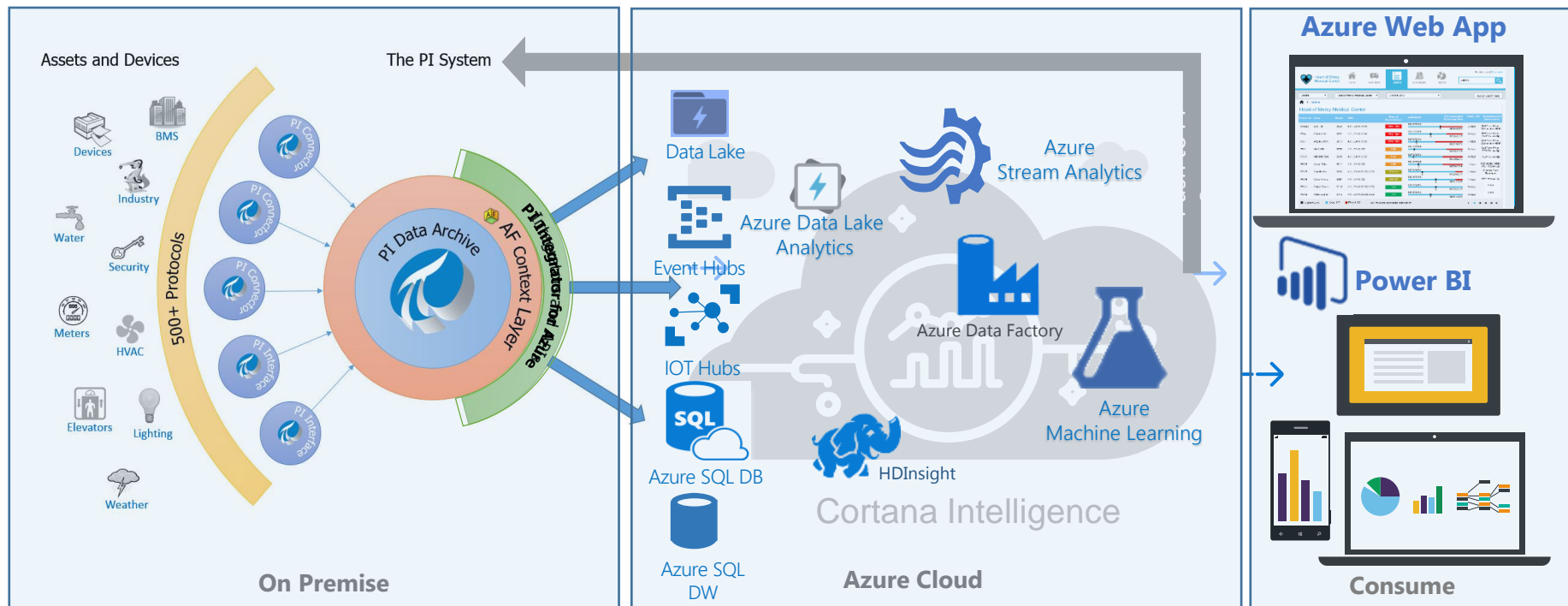
The type of normalizer
Min-Max normalizer

☒ Shuffle examples

Quick Help
Creates a binary classifier using a neural network algorithm
(more help...)

NEW RUN HISTORY SAVE SAVE AS DISCARD CHANGES RUN SET UP WEB SERVICE PUBLISH TO GALLERY

PI Integrator for Azure



EXAMPLE SOLUTIONS



Predictive maintenance



Smart buildings



Operational efficiency



Demand forecasting

Microsoft and OSIsoft – Better Together

MICROSOFT	TOGETHER	OSISOFT
Easy to manage and deploy	Up and running < 2 weeks	Open & compliant platform for Industrial IoT
On-prem, cloud and hybrid options	Leverage your existing investments in People, Skills, Datasets and Systems	Broadest range of connectivity
Pay for what you use	Get more value customized for your business (vs. prepackaged solution)	Complex devices - Asset intensive industries
Use internal/external business impact datasets with ease	Self-service Business	Customer owns the data
		Customer/domain intimacy

Conclusion

- PI Integrator for Business Analytics greatly broadens our ability to solve problems by providing data to Subject Matter Experts unfamiliar with the PI System.
 - Utilize Familiar Tools
 - Collaboration
- Decouples ability to solve a problem from expertise of a single tool or platform

Contact Information

Scott Harmeier

Scott.Harmeier@ADM.com

Process Optimization Manager
Archer Daniels Midland Company



Priya Sathy

priyasa@microsoft.com

Principal Program Manager
Microsoft



Prabal Acharyya

Prabal@OSIsoft.com

WW Director, IoT
OSIsoft



Questions

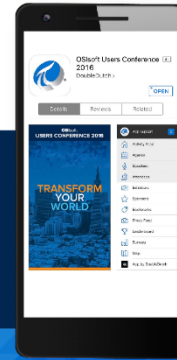
Please wait for the **microphone** before asking your questions



State your **name & company**

Please remember to...

Complete the Online Survey for this session



Download the Conference App for OSISOFT Users Conference 2016

- View the latest agenda and create your own
- Meet and connect with other attendees



search **OSISOFT** in the app store



<http://ddut.ch/osisoft>

감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado

The background of the slide is a dark blue gradient with a faint, stylized image of the San Francisco skyline, including the Golden Gate Bridge and the Transamerica Pyramid. The OSIsoft logo is positioned at the top center.

OSIsoft®

USERS CONFERENCE 2016

April 4-8, 2016 | San Francisco

TRANSFORM
YOURWORLD