



**OSI**soft®

VIRTUAL REGIONAL SEMINAR

# Seminario Regional Virtual Austral 2020

Infraestructura de datos integrada con  
valor para el negocio

Comenzaremos a las 9:30 AM Santiago | 10:30 AM Buenos Aires



VIRTUAL REGIONAL SEMINAR

# Seminario Regional Virtual Austral 2020

Infraestructura de datos integrada con  
valor para el negocio

Comenzaremos en algunos minutos



**OSI**soft®

VIRTUAL REGIONAL SEMINAR

# BIENVENIDOS

Paula Reichert, Regional Sales Manager, OSIsoft

# OSISOFT

## Remote Operations

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Paula Reichert | Sales Director

June 25th



# WHAT IS REMOTE OPERATIONS

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Ensuring critical business operations continuity while providing workforce flexibility with the ability to securely monitor, visualize and manage assets with real-time data.



# WHAT'S DRIVING REMOTE OPERATIONS

Industries have been doing this for years, but COVID-19 has highlighted and accelerated the need to further leverage technology to address these current challenges.



## Challenges



Cost Analysis

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Managing Cost Pressures

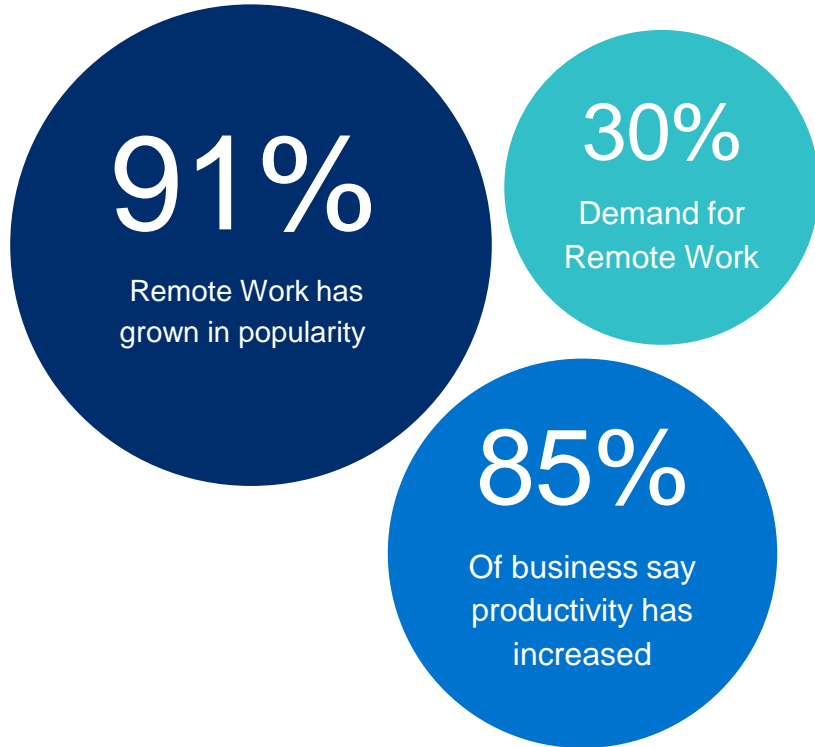


Workforce Safety & Health



Operating with Less People

# REMOTE WORKFORCE TRENDS



- Remote work has **grown in popularity by 91%** over the last 10 years
- By 2030, the demand for remote work **will increase by 30%** as Gen Z fully enters the workforce
- **85% of businesses** say productivity has increased as “a result of greater flexibility”

Source: U.S. Census and Bureau of Labor Statistics data by [Global Workplace Analytics](#)

# REMOTE ASSETS

CONNECTING THE ASSETS WITH THE WORKFORCE



Renewables



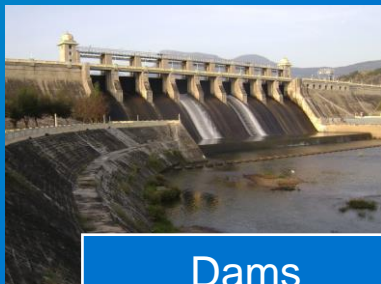
Lines



Mines



Distributed Energy



Dams



Remote Wells



# REMOTE WORKFORCE

## CONNECTING THE WORKFORCE WITH THE ASSETS



Provide Safe and  
Healthy Work  
Environment



Enable Data  
Access to Support  
Quick Decisions



Leverage Asset  
Data to Optimize  
Operations



Engage with Real  
Time Mobile Data  
from Assets

Multiple stakeholders working remotely need various types of data!

# REMOTE OPERATIONS REQUIREMENTS



***Guarantee Operational Consistency***



***Enabled Flexible Workforce***



***Stay Secure & Compliant***



***Protect Personnel Health & Safety***

# THANK YOU

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Paula Reichert

Follow us on LinkedIn



# OSISOFT

## Virtual Regional Seminar - Austral

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David Lazcano | Account Manager

June 25<sup>th</sup> 2020



# Building a strong digital foundation for continuous operational intelligence



David Lazcano



# PPE looks different these days





Some things change...

**Cloud**

\$162b

**IoT**

20b devices

**AI**

\$16T in GDP

**Big data**

600 zettabytes



...while others don't

Productivity

Sustainability

Resiliency

Continuity



# Industry leaders are proactively moving



## OLD WORLD

- Clip board data collection
- Data silos
- Opinionated debates
- ▶ **RISK:** Slow and rigid



## NEW WORLD

- Digital visibility
- Data-driven decisions
- Faster communications
- ▶ **OPPORTUNITY:** Fast and agile

# Continuous data. Continuous intelligence. Continuous improvement.





# ArcelorMittal beats market forces

## FORCES

- Inflation raised costs while market prices dropped
- Global competition from high-quality, low-price imports
- Shareholder value substantially eroded



## RESULTS

- Saved \$1 million per year per furnace
- \$19 million in total projected savings from one use case
- Increased time between furnace re-linings



# Local college ensures power stability and reliability

## FORCES

- Santa Rosa Junior College determined to be resilient to natural disasters
- Operators struggle to overcome grid instability and poor power quality



## RESULTS

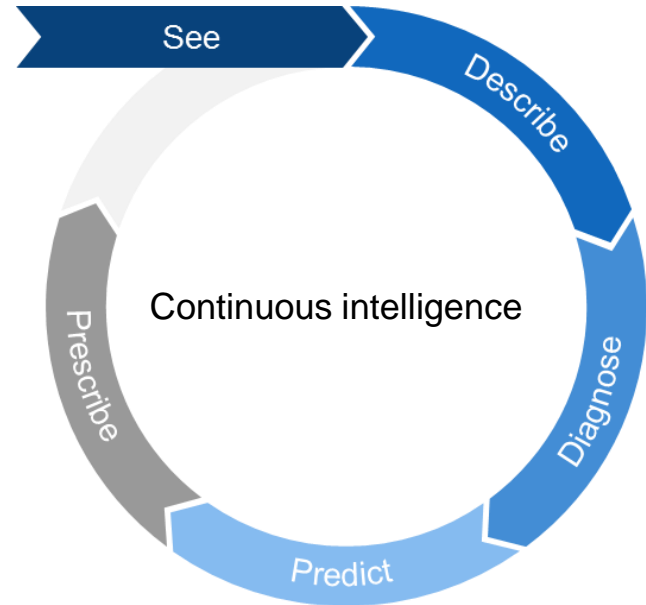
- Enabled campus-wide reliability and improved power quality
- Reduced green house gas emissions
- \$330,000 expected energy savings per year

# What do they have in common? They can trust their data.

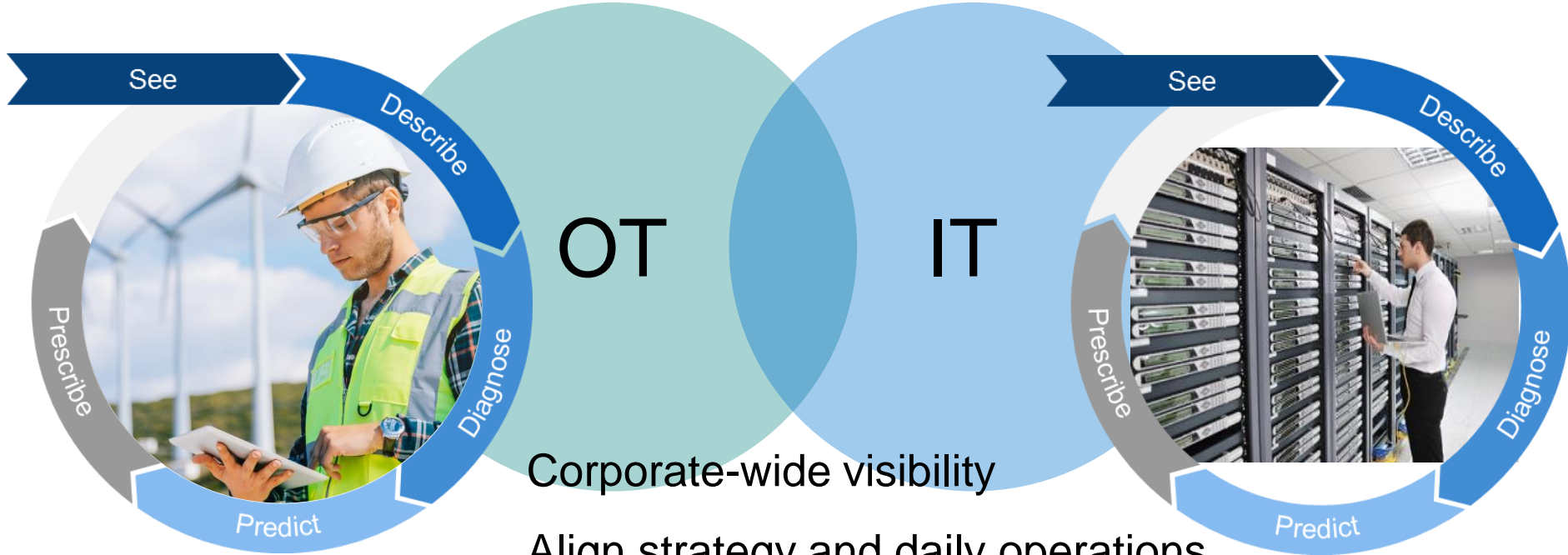
Align daily operations  
with corporate strategy



Make faster, smarter  
decisions. Better  
outcomes



# Different worlds. Different language. Different context.



# Return to first principles

Good data in → Good decisions out



# Return to first principles

**Good data in** →

- ✓ Reliable
- ✓ Real-time
- ✓ In context
- ✓ Validated
- ✓ Secure
- ✓ ...

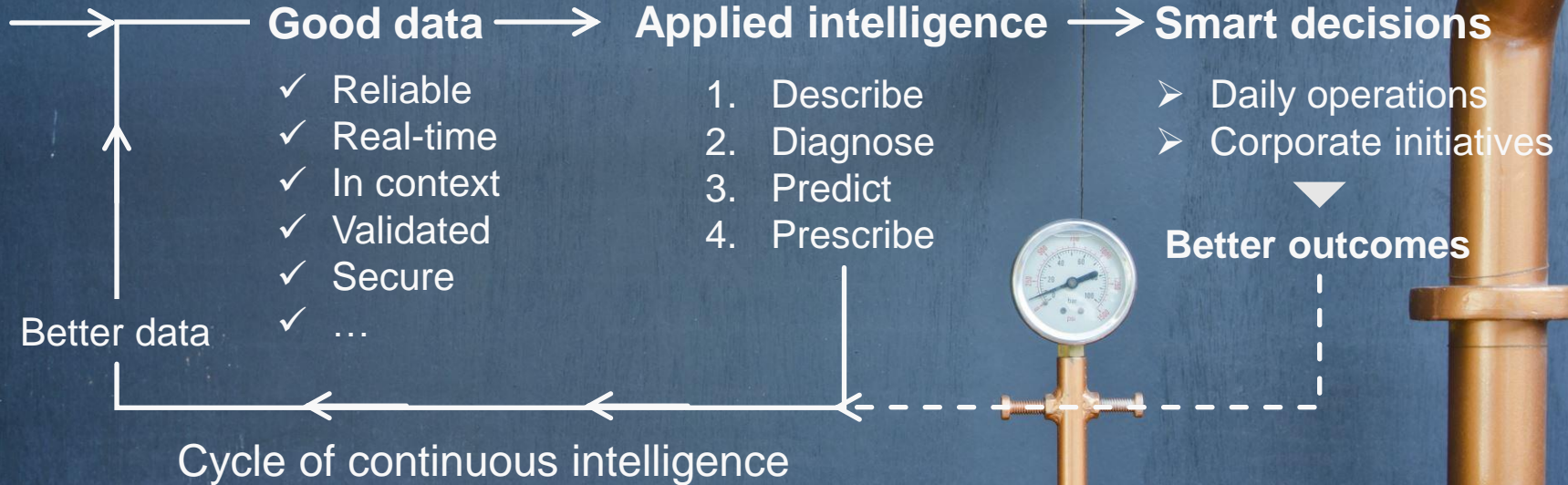
**Good decisions out**

- Daily operations
- Corporate initiatives

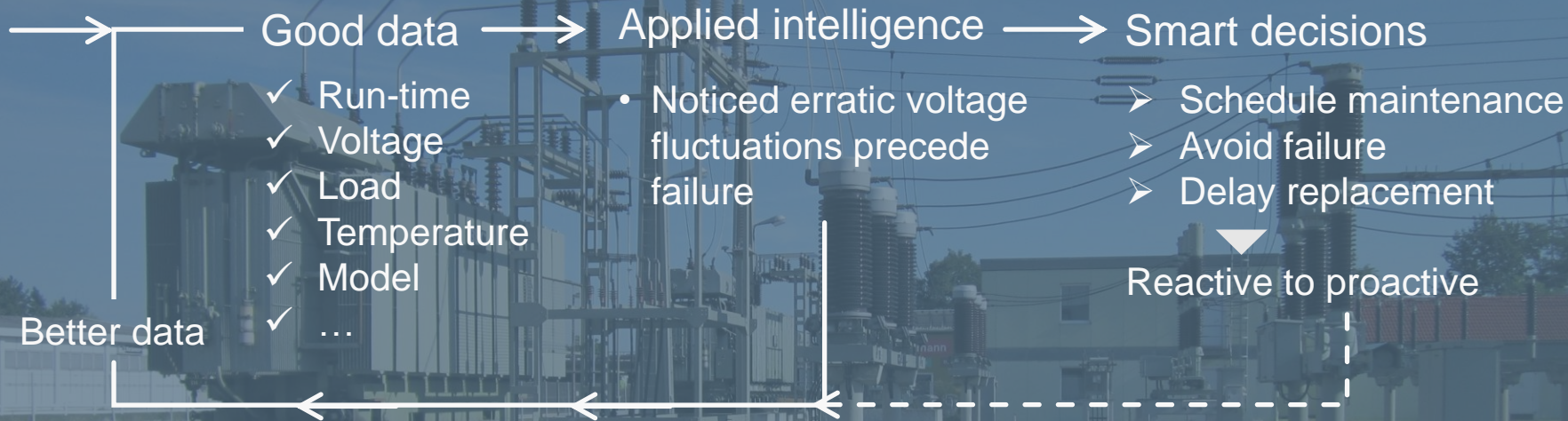




# Better outcomes stem from a cycle of intelligence



# Example: Fundamental shift from reactive to proactive



Cycle of continuous intelligence:  
*Apply streaming calculation for standard deviation of voltage*

# The Analytics Journey

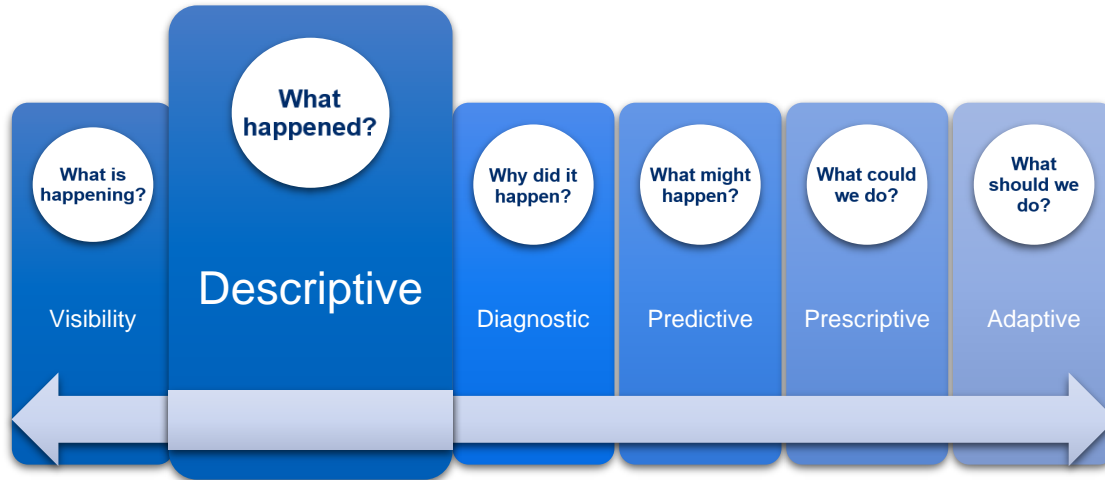


# The Analytics Journey



By looking at raw operational data, what is happening?

# The Analytics Journey



You've seen your raw data and now, looking back, you can see what failures occurred. You better understand your processes via trends, reports, KPIs, dashboards, events, etc.

# The Analytics Journey



Using diagnostic tools and capabilities, investigate why something has happened to evaluate preventive measures such as new calculations and descriptive analytics, alerts, and notifications.

# The Analytics Journey



Based on historical analysis, what predictions can you make? This includes projects like condition-based maintenance and early detection of failures via simple predictive analytics or more advanced predictive analytics like machine learning, statistical analytics, or BI.

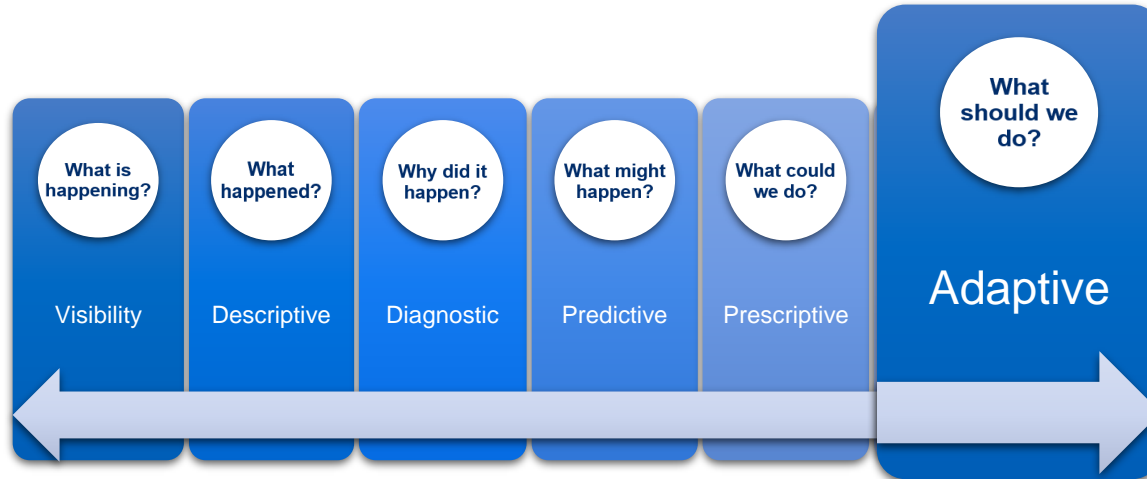
# The Analytics Journey



You understand your data and your process. You start evaluating options of what could you do with different scenarios, select one and then making it operational in the previous analytical levels.

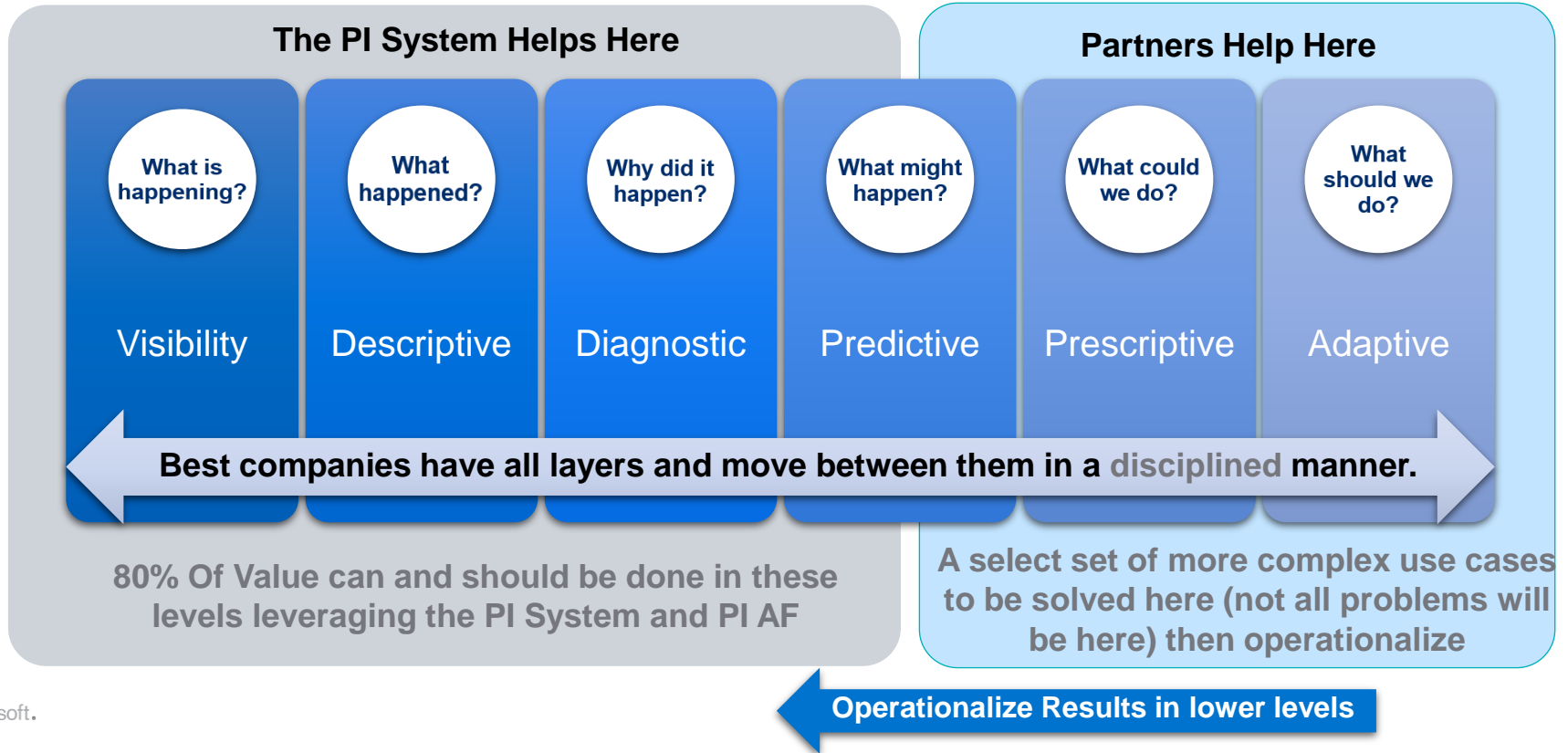


# The Analytics Journey



From several options of what could you do (prescriptive analytics), what should you do with continuous learning and auto selection of an option, then operationalizing it to create a closed loop

# The Analytics Journey



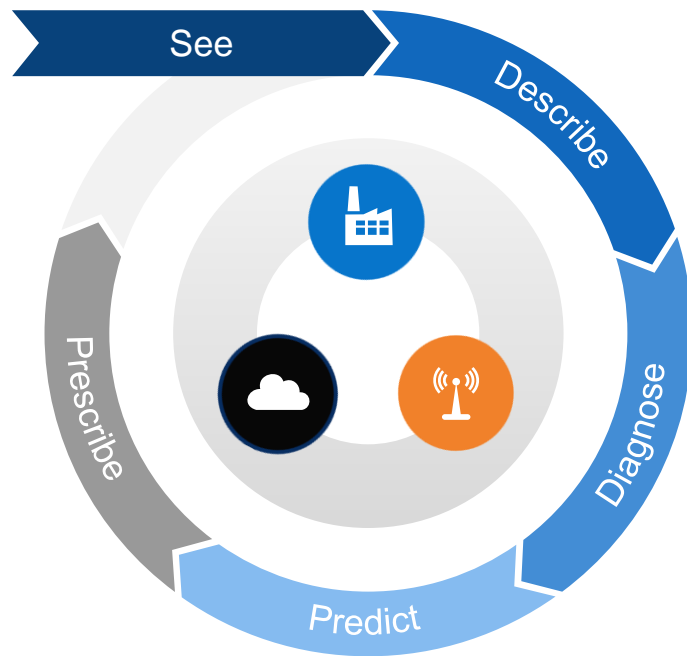
# Invest in a digital foundation for continuous intelligence

“a design pattern in which **real-time analytics** are integrated into **business operations**, processing current and historical data to **prescribe actions**.”

By 2022,

**>50%** of major new business systems will incorporate **continuous intelligence**

Source: Gartner, 2020

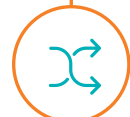




## PI System is the trusted digital foundation for continuous intelligence



Implemented in 21,000+ sites internationally



Over 2 billion streams



Delivering consistent value for over 40 years



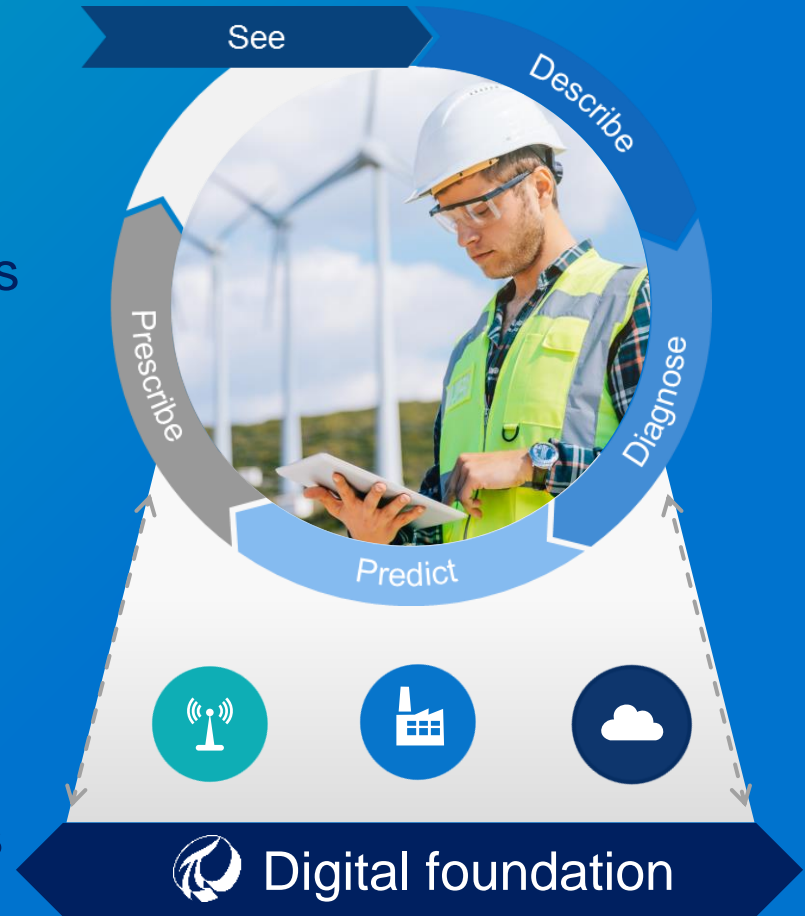
Continually innovating to bring new technology to operations

# Today's seminar

- Building a digital foundation
- Speaking the language of analytics and continuous intelligence to bridge IT/OT divide
- Advocate a system of record that can serve the needs of plant and enterprise

Corporate-wide visibility

Align strategy and daily operations



# Your digital foundation drives continuous intelligence

- Accelerating your analytics journey
- Bridging the IT/OT divide
- Aligning corporate strategy with daily operations
- Providing digital agility to thrive in a dynamic environment



What value will you create today?

# THANK YOU

---

David Lazcano  
Account Manager  
dlazcano@OSIsoft.com  
Follow us on LinkedIn





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VIRTUAL REGIONAL SEMINAR

# Monitoreo basado en condiciones: Monitoreo de ensuciamiento de intercambiadores de calor

**YPF**

**Pablo Matiasich, Electronic Engineer**



# Agenda

- YPF Introduction
- Business Challenge
- Fouling Monitoring
- Conclusion



**LA EMPRESA  
DE ENERGÍA  
LÍDER EN  
ARGENTINA**

**El mayor productor**  
de hidrocarburos  
del país

Productor de  
no convencional  
de clase  
mundial,  
**el mayor fuera  
de EE.UU.**

**Cotiza en  
las Bolsas**  
de NY y BA  
desde 1993

**El mayor player**  
de Downstream

**#5 generador**  
eléctrico

YPF LUZ

La empresa  
que **más invierte**  
en el país

**Y-TEC**

Centro de I+D de clase mundial,  
proyectos energéticos.

**Exportadores**  
de gas natural

# Downstream Industrial Installations

Gerencias Downstream	Complejos/Sitios					
Refino	CILP	Refinería La Plata	CILC	Refinería Luján de Cuyo	CIPH	Refinería Plaza Huincul
Química		Petroquímica La Plata				Metanol
Logística	Terminales	Ductos	Puertos	Aeroplantas	Plantas de GLP	
Comercial	CILE	Lubricantes, Asfaltos, Parafinas				

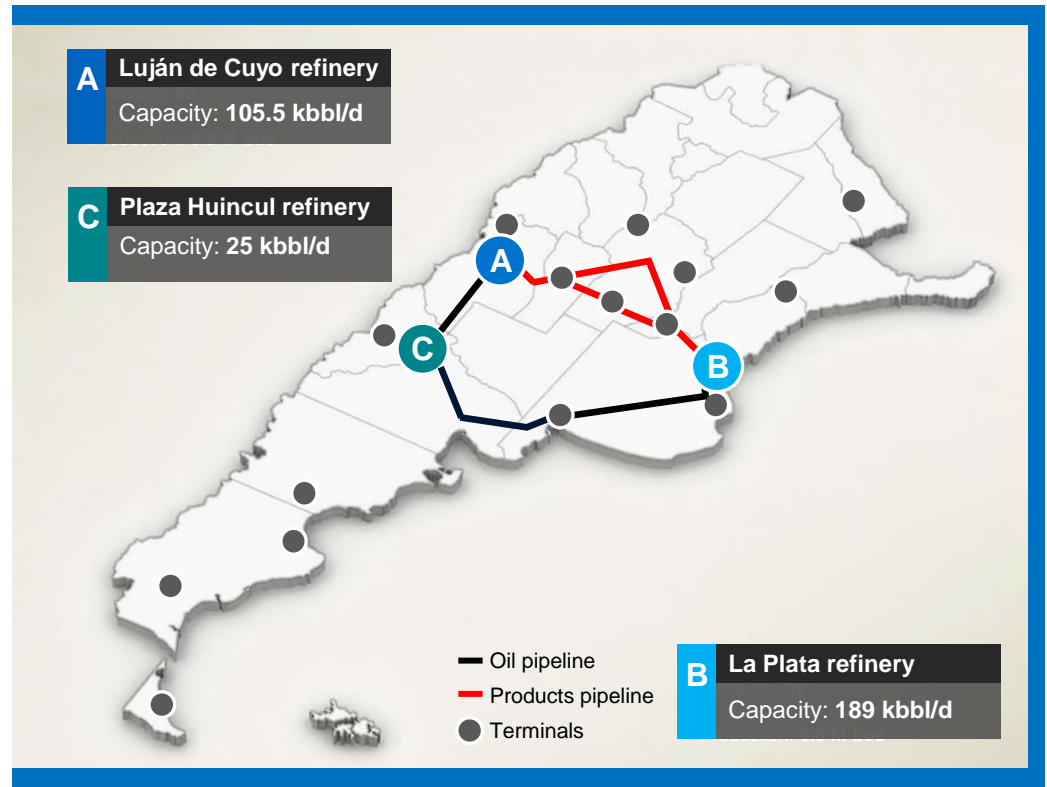
# Downstream Industrial Installations

Negocio	U. Proceso	Serv. Aux	Tks/Esf.
Refino	64	28	302
Química	32	7	226
<b>Total</b>	<b>96</b>	<b>35</b>	<b>528</b>

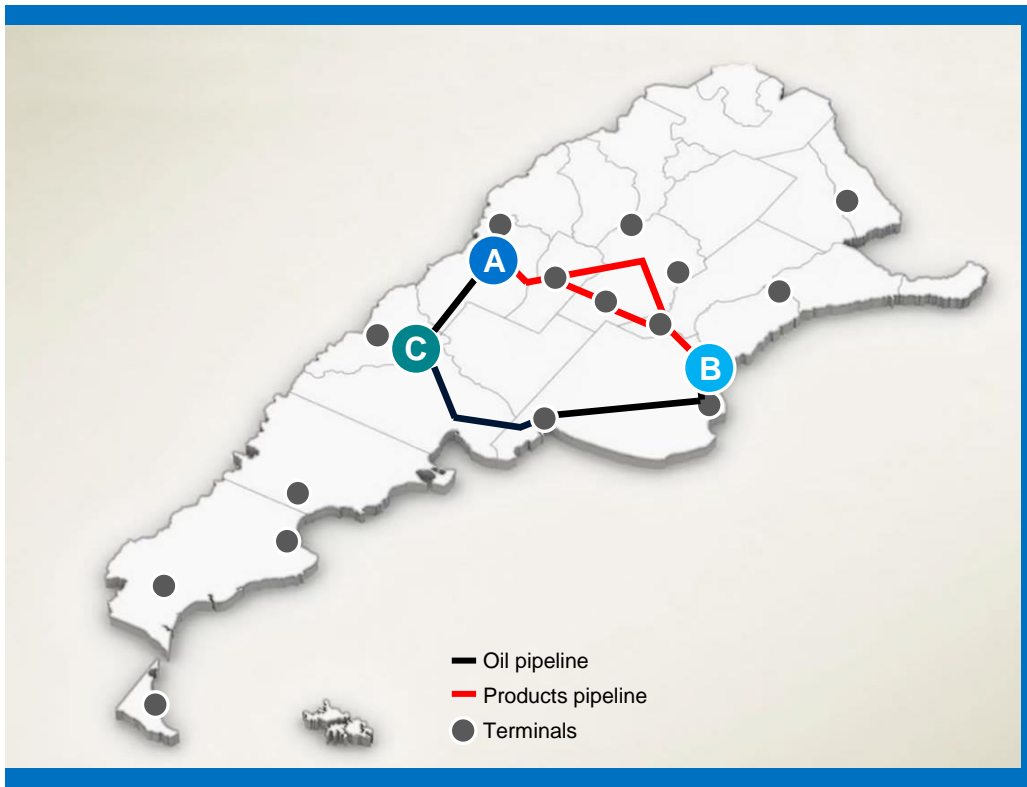
CILC	U. Proceso	Serv. Aux	Tks/Esf.
Refino	28	9	85

CILP	U. Proceso	Serv. Aux	Tks/Esf.
Refino	31	15	168
Química	30	5	215
<b>Total</b>	<b>61</b>	<b>20</b>	<b>383</b>

CIPH	U. Proceso	Serv. Aux	Tks/Esf.
Refino	5	4	49
Química	2	2	11
<b>Total</b>	<b>7</b>	<b>6</b>	<b>60</b>



# Downstream Industrial Installations



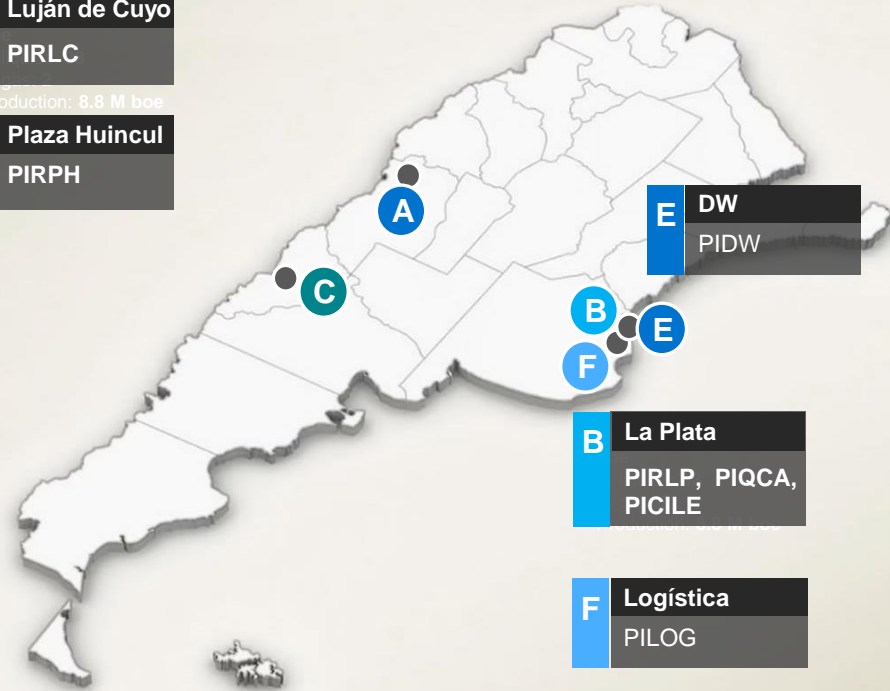
CILE	U. Proceso	Líneas Envasado	Cargaderos Recep/Disp	Almac.
Comercial	2 (Bld L, Asf.)	5 Lub 2 Paraf.	2	138 Tk 1 Silo Aut. 2 Galpones 1 Picking

Logística				
Inst. Transporte	Crudos		Productos	
	Ductos	EEB B	Ductos	EEBB
	3 (total: 1218km)	14	2 Polid (total: 1774 km) 2 Propano (total: 125 km) 1 JP (11 km)	11

Logística				
Inst. Recepción y Despacho	Terminales	Aeropantallas	Puertos	Plantas de GLP
	16	52	9	7
Almacenamiento	286 Tk			

# PI System in Downstream

<b>A</b>	Luján de Cuyo PIRLC
Production: 8.8 M boe	
<b>C</b>	Plaza Huincul PIRPH



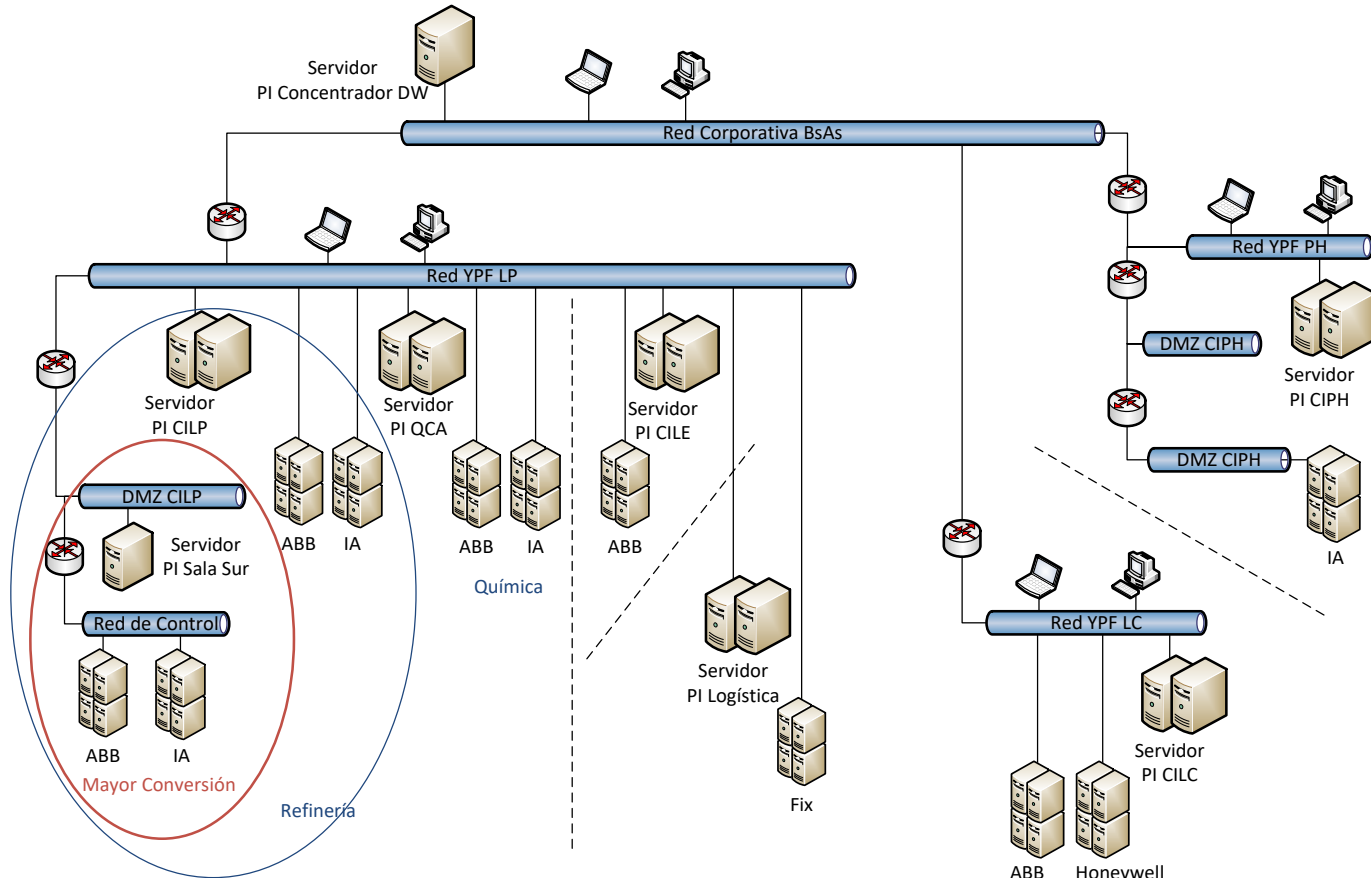
<b>E</b>	DW PIDW
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<b>B</b>	La Plata PIRLP, PIQCA, PICILE
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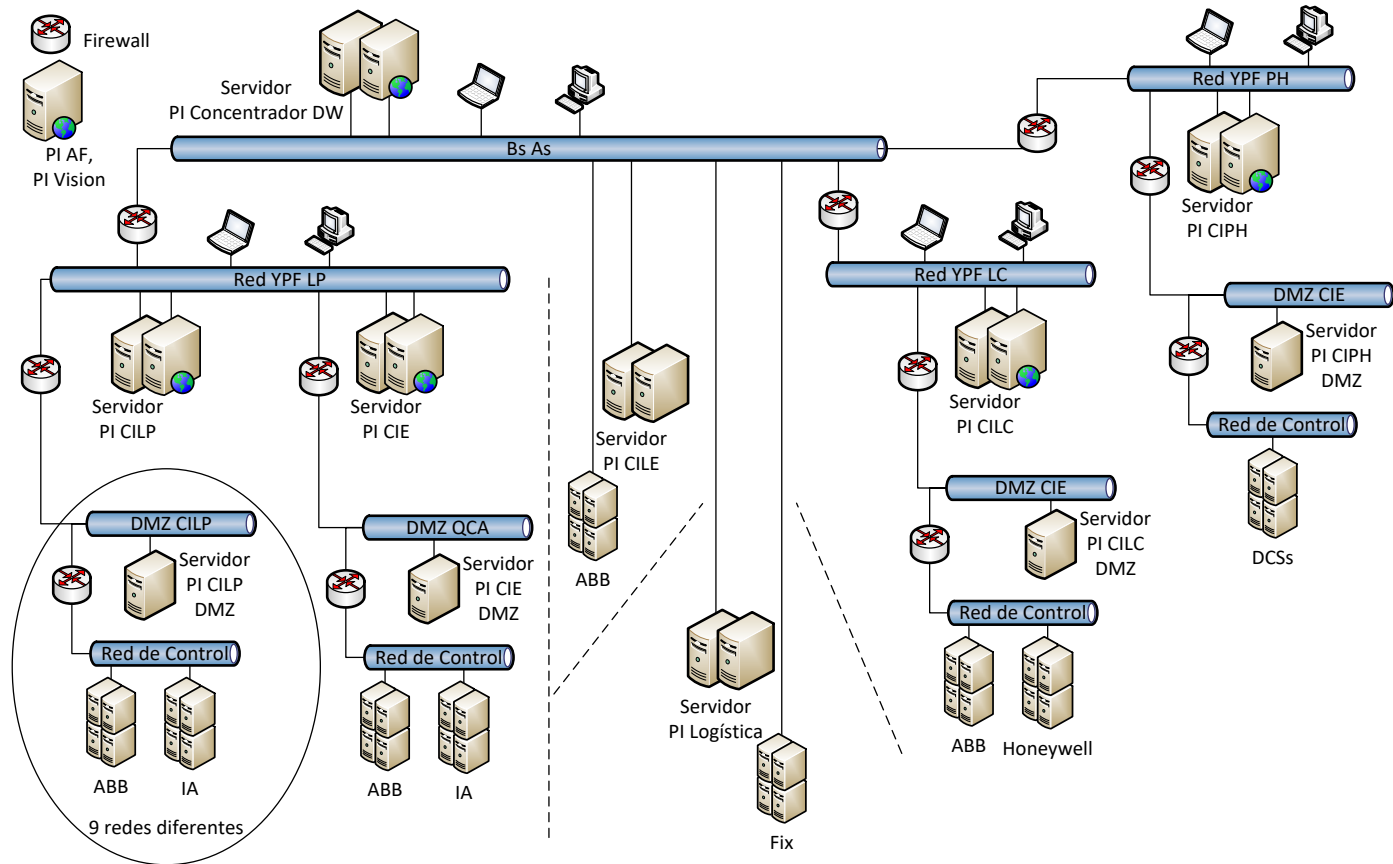
<b>F</b>	Logística PILOG
----------	--------------------

- First installation in 1995, 3 sites
- 20 years of data history online
- PI AF since 2010, 3 more sites, PIQCA, PICILE, PILOG
- +350000 points in Downstream
- EA since 2018
- 2019, 1 more site PIDW

# Current PI System Architecture in Downstream



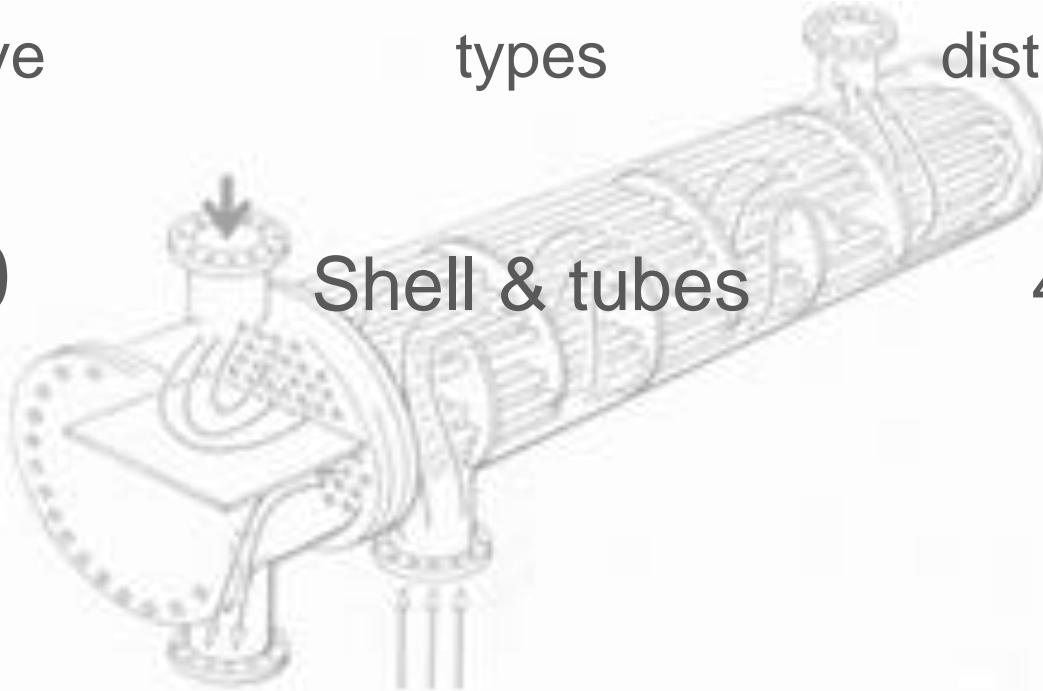
# Future PI System Architecture in Downstream





# Exchangers in Refineries

- We have types distributed in
- +200 Shell & tubes 4 sites



# Before

- Process Simulators with PI System data
- Each exchanger needed its own simulation
- Each simulation needed time to analyze and prepare operational data
- Process engineers needed time to do their job
- A spreadsheet for the cleaning priority

# Present

- PI System Implementation
- Online
- Stream properties calculated in each iteration
- Allow to generate Event, alarms and sending e-mails
- Exchangers comparison based on fouling or achievable economic benefit

# PI AF: Implementation and Analysis

- Two PI AF elements
- Two level structure
  - Main level for exchanger
  - Secondary level for the streams
- Each exchanger has a spreadsheet for verification

# Excel Method Validation

Bisección: raíces de m cp ( $\Delta T$ ) = U A LMTD ft				Coeficientes conversión unidades						
Fluido seleccionado 1 FC, 2 FF		1	Pos	198,8262892	1	194,7589207	kg/s - lb/h	0,471196		
Condiciones operativas.		Sgn(QGeom-QTerm)		-1		Btu/lb*R - J/kg *C		4186,8		
Fluido caliente		(QGeom-QTerm)		-1465776,1 W		W - Btu/h		3,4144259		
Variable	Valor	Unidades	Fluido Frio		Calculos Intercambiador		Coraza			
Caudal masico mh	43,20715807	kg/s	Valor	Variable	Fluido Caliente	Fluido Frio	Fluido Caliente	Fluido Frio		
Temp entr	251,1270536	C	78,13671881	78,13671881	*	*	Re <sub>m</sub>	4919,3873	16351,817	
Temp Salida Medida	908,1274259	R	596974,9054	596974,9054	Re	4737,850134	15748,396	G <sub>m</sub>	646,52729	1169,1933
Temp Salida limpio	842,2360573	R	166,2873417	166,2873417	v	0,818797466	1,5855979	Pr	59,189	31,436904
Calor aportado por el fluido caliente			194,76	199,19	Pr	59,18900015	31,436904	N <sub>r</sub>	1095	4
Cp	0,614829944	Btu/lb*R	LMTD		N <sub>p</sub>	4	4	(μ / μ <sub>w</sub> )	0,768521405	1,2318673
Qh Limpio	-21406431,53	Btu/h	Tsi - Tto	51,93723844	Nu	79,60223852	170,35011	Nu	79,60223852	170,35011
Qh Actual	-2197960,084	Btu/h	Tso - Tti	28,471579	hi	511,6026389	1104,4213	hi	511,6026389	1104,4213
Propiedades Fluido			Propiedades Fluido		Propiedades Fluido		Propiedades Fluido		Propiedades Fluido	
Parametro	Valor	Unidades	U*A*LMTD*ft	W	4803632,531	U	W/m2 C	511,872453	ft	0,738513522
Dens Ti	833,57	Kg/m3	U*A*LMTD*ft	W	4803632,531	ft	W/m2 C	511,872453	LMTD	C
a1	0,010396027		A	m2	325,5828639	LMTD	C	39,02905437	A	m2
a2	0,000440492		ft			A	m2	325,5828639	Propiedades Fluido	
a3	-7,61888E-08		ft			U	W/m2 C	511,872453	ft	0,738513522
MeABP	968,1376379	*F	ft			LMTD	C	39,02905437	A	m2
PM	507,9527625		ft			A	m2	325,5828639	Propiedades Fluido	
Temp PsC	704,2722658	C	ft			U	W/m2 C	511,872453	ft	0,738513522
PresPsC	10,85788073	kgf/cm2	ft			LMTD	C	39,02905437	A	m2
Fact ZRA	0,245288387		ft			A	m2	325,5828639	Propiedades Fluido	
Z1	981,37		ft			U	W/m2 C	511,872453	ft	0,738513522
LogLog	0,476017569		ft			LMTD	C	39,02905437	A	m2
Fac B	-3,588392919		ft			A	m2	325,5828639	Propiedades Fluido	
R	10,731	mol/L	ft			U	W/m2 C	511,872453	ft	0,738513522
Temperatura salida fluido no seleccionado			Temperatura salida fluido no seleccionado		Temperatura salida fluido no seleccionado		Temperatura salida fluido no seleccionado		Temperatura salida fluido no seleccionado	
Temperatura salida fluido no seleccionado			Temperatura salida fluido no seleccionado		Temperatura salida fluido no seleccionado		Temperatura salida fluido no seleccionado		Temperatura salida fluido no seleccionado	



# PI AF: Configuration and Analysis Tool

**Elements**

- Intercambiadores:
  - C-E1
  - C-E5A
  - C-E5B
  - C-E5C
  - C-E5D
  - C-E6A
  - C-E6B
  - C-E6C
  - C-E6D
  - C-E6E

**Elements**

**Event Frames**

**Library**

**Unit of Measure**

**Contacts**

**Management**

Complejo

**C-E6C**

General Child Elements Attributes Ports Analyses

Excluded attributes are hidden.

Filter

Name	Value
Gs	106,15
LMTD	14,458 °C
PorcFouling	75,04 %
Qc Actual	298,35 kW
Qc final	1195,4 kW
Qc Inicial	1195,4 kW
Qc no selec	1195,4 kW
Rf	170,35 W/m2 K
Salida Sele...	1
U	227,01 W/m2 K
Category: Cond Operación	
Masa Fluid...	9,5635 kg/s
Masa Fluid...	54,483 kg/s
Temperatu...	308,31 °C

**C-E6C**

General Child Elements Attributes Ports Analyses Notification Rules Version

Name: 3-TemperaturaSeleccionada

Description:

Categories:

Analysis Type:
  Expression
  Rollup
  Event Frame Generation
  SQC

Name	Expression	Output At
QcF	$Convert(Masa * convert(CpF, "J/(kg K)") * (TempCalculada - T$	Map
A3	$if badval('A31') then -((cpa1 * TempEntF) + (cpa2 * (TempEnt$	Map
A31	$-((cpa1 * TempEntF) + (cpa2 * (TempEntF^2)) + ((3/4) * cpa3$	Map
Q	$((-3 * A2) + (A1^2))/9$	Map
R	$((-9 * A1 * A2) + (27 * A3) + (2*(A1^3)))/54$	Map
Q3R2	$(Q^3) - (R^2)$	Map

Scheduling:
  Event-Triggered
  Periodic

Period: 00h 03m 00s, Offset: 00h 00m 37s

Connected to the PI Analysis Service.

ada Modified:23/7/2019 09:48:38 Owner:YPF\Y133534A

# PI Vision: Analysis Tool



# PI Vision: Analysis Tool





# Maximize thermal recovery

Pablo Matiasich, Optimization & Control, YPF SA

CHALLENGES	SOLUTION	BENEFITS
<ul style="list-style-type: none"><li>• Exchanger fouling Monitoring</li></ul>	<ul style="list-style-type: none"><li>• On-line heat exchanger tracking</li><li>• PI AF</li><li>• PI Analytics</li><li>• PI Vision</li></ul>	<ul style="list-style-type: none"><li>• Minimize load losses</li><li>• Analyze exchanger trains</li><li>• Prioritize equipment cleanings</li><li>• Condition based e-mail sending</li></ul>



We focus mainly on crude oil exchange trains, because that's where we can recover the most energy.



# Implementation requirements

- Distillation curves for each stream
- Density
- Exchanger data sheet
- Operational conditions

# THANK YOU

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**Pablo Matiasich, Electronic Engineer**  
**[pablo.matiasich@ypf.com](mailto:pablo.matiasich@ypf.com)**



# OSISOFT

## Seminario Regional Virtual - Austral

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Gonzalo Merciel | Pre-Sales Engineer

June 25<sup>th</sup> 2020



# Gestión Extendida de los Datos Operacionales

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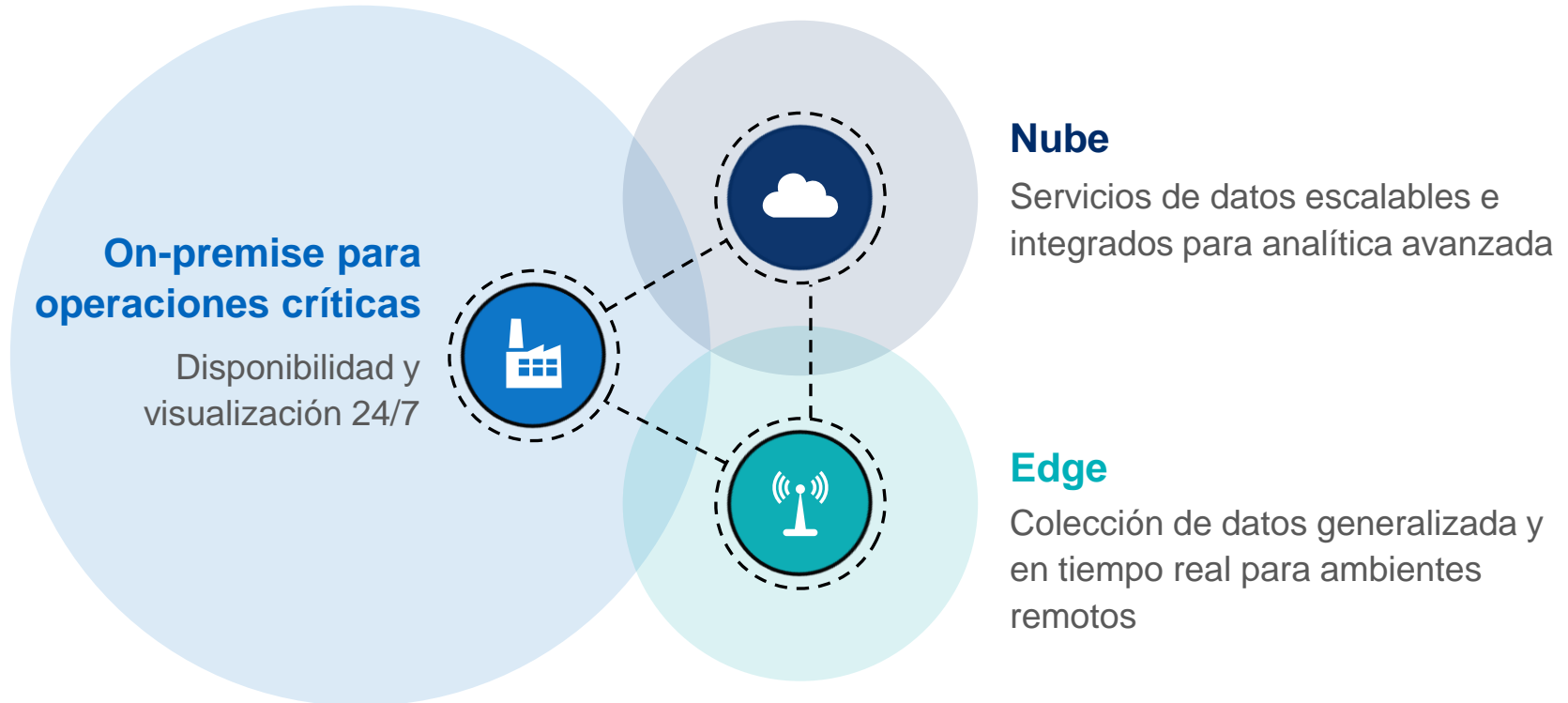
# El PI System fue originalmente optimizado para la información de planta

**On-premise para  
operaciones críticas**

Disponibilidad y  
visualización 24/7



# El PI System continúa añadiendo capacidades distribuidas soportando múltiples casos de uso de OT & IIoT





# Única Versión de la Verdad

---

- Información accionable y en contexto
- Ambiente sin código
- Soporte para decisión en Tiempo Real







## Soporte para escenarios Edge IoT

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Colección de datos resiliente en  
dispositivos robustos

Adaptable a conectividad limitada

Permite decisiones en el lugar



## Analítica y uso compartido, a escala

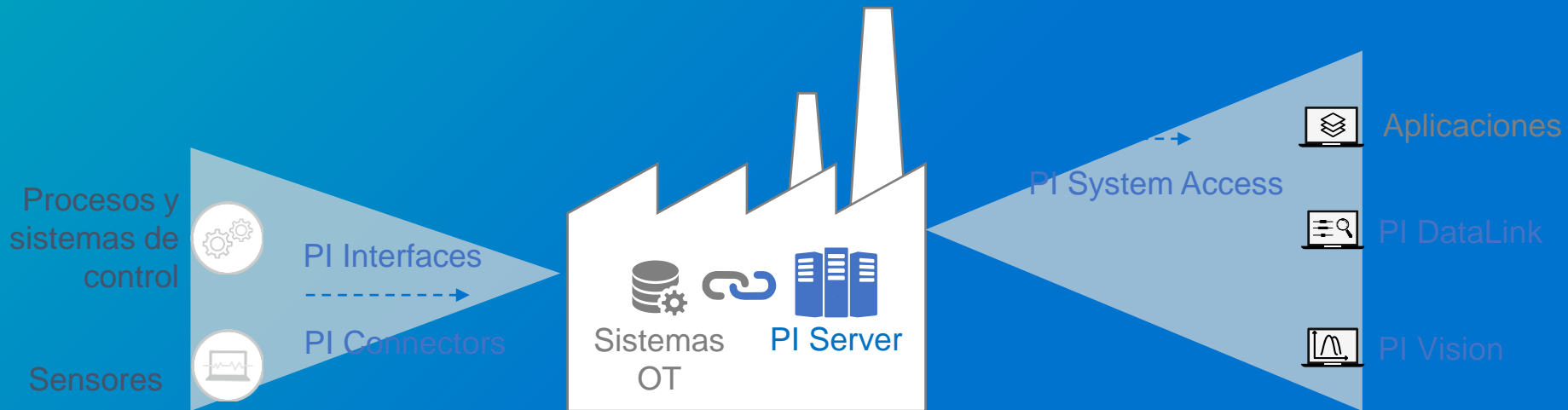
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- Código nativo de la Nube construido sobre microservicios para lograr elasticidad
- Visibilidad global
- Uso compartido de datos crea nuevas redes de valor

# Cobertura de Productos y Nuevos Lanzamientos

---

# Software on-premise para soportar operaciones 24/7



# Nuevos lanzamientos continúan soportando el núcleo de su negocio

## Seguridad de todo el sistema (Abril 2020)

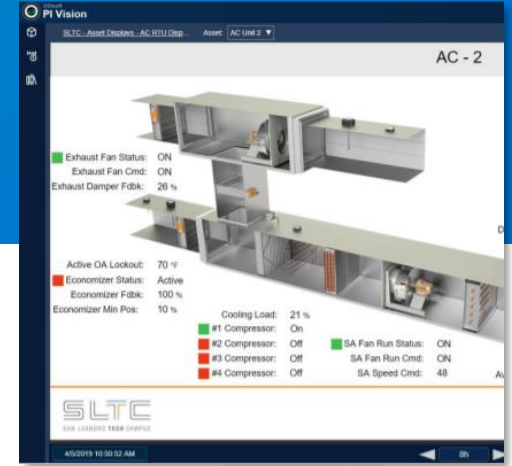
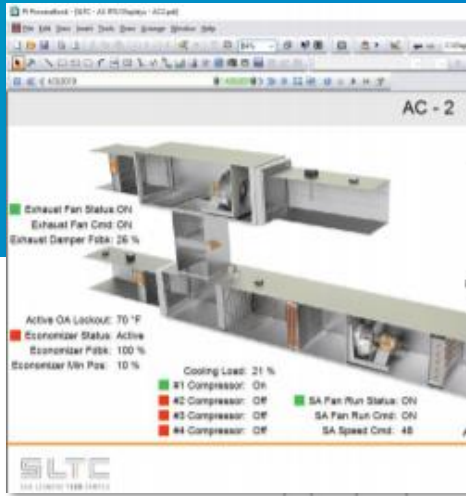
- Permisos mínimos
- Verifica plugins AF
- Arregla vulnerabilidades



# Nuevos lanzamientos continúan soportando el núcleo de su negocio

## Utilidad de migración de PI ProcessBook a PI Vision

- Migra pantallas
- Proteje inversión
- Aprovecha móviles



Procesos y  
sistemas de  
control



PI Interfaces

PI Connectors

Sensores



PI System Access



Aplicaciones

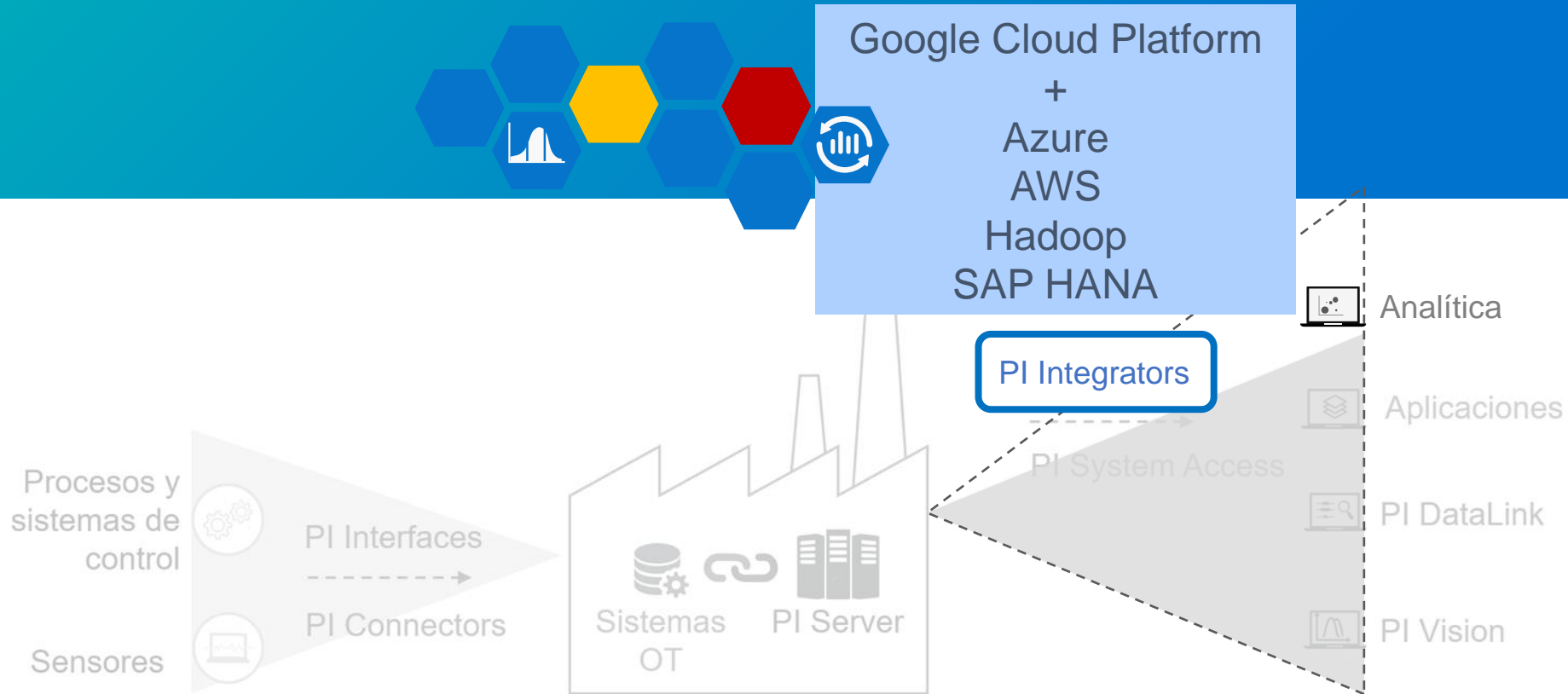


PI DataLink

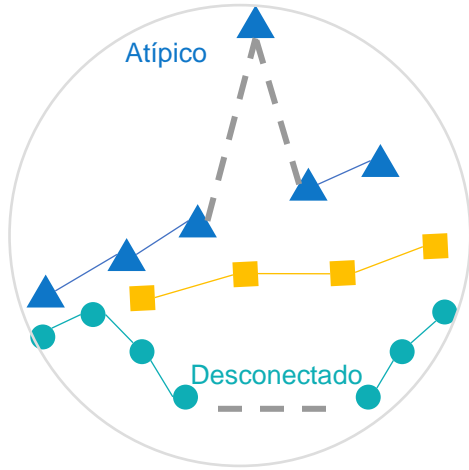


PI Vision

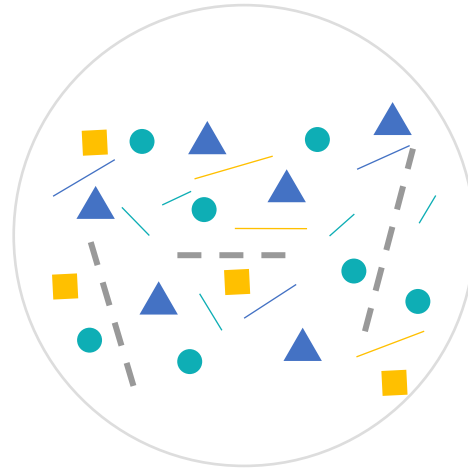
# Nuevos destinos para PI Integrators expanden sus opciones de analítica



# Error común: arrojar datos OT en un data lake



**Datos OT**  
desordenados  
pero significativos



**Data Swamp**  
Científicos de datos gastan  
80% de su tiempo como  
"conserjes" de datos

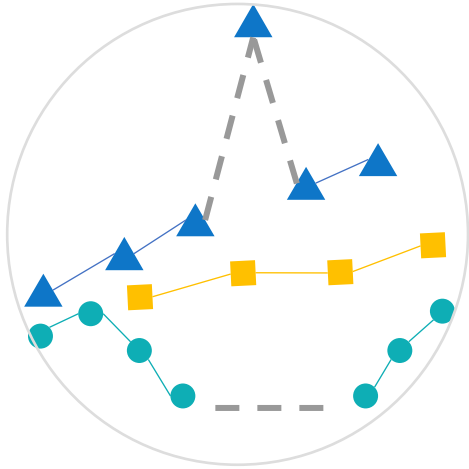


**Analítica "Sin Salida"**  
Tiempo y dinero perdidos

Termina utilizando AI y ML onerosos para redescubrir ecuaciones científicas.



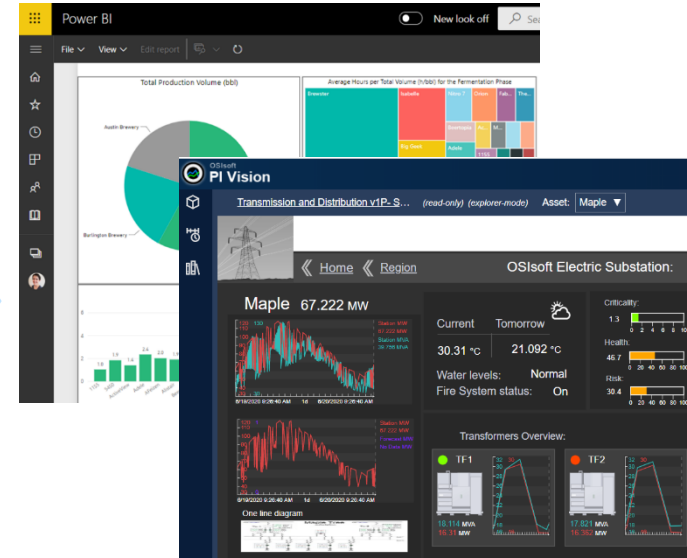
# El PI System entrega datos OT listos para su análisis



**Datos OT**  
desordenados  
pero significativos



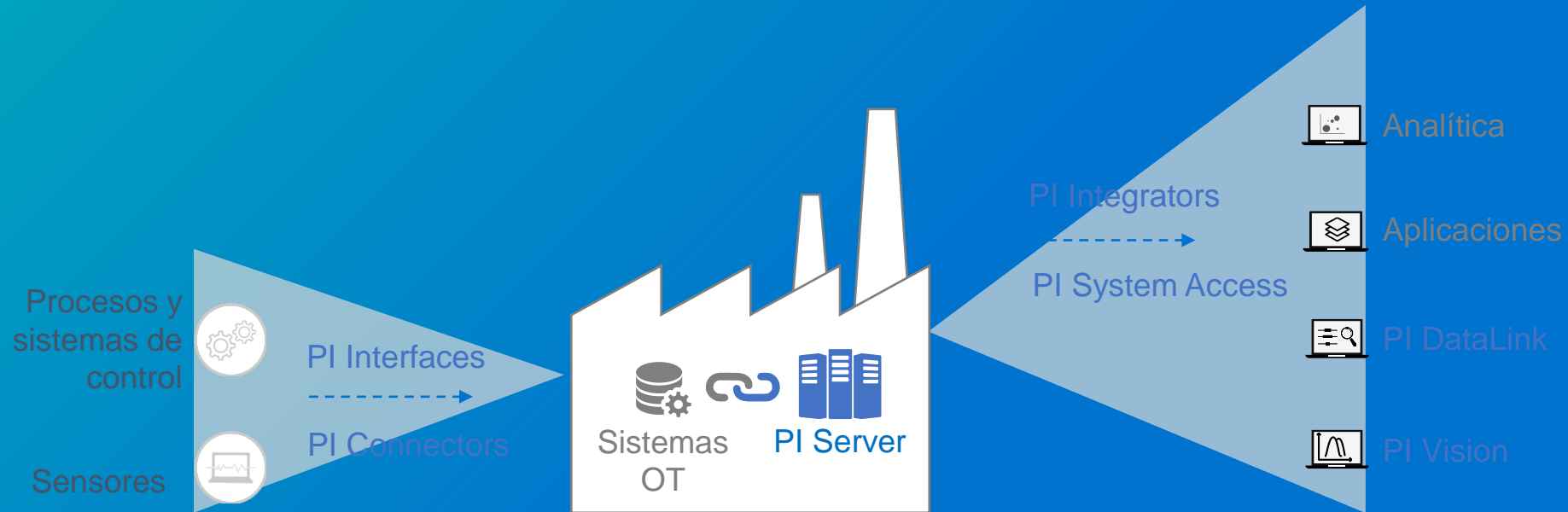
**PI Integrators**  
Datos formateados e interpolados  
listos para herramientas de BI



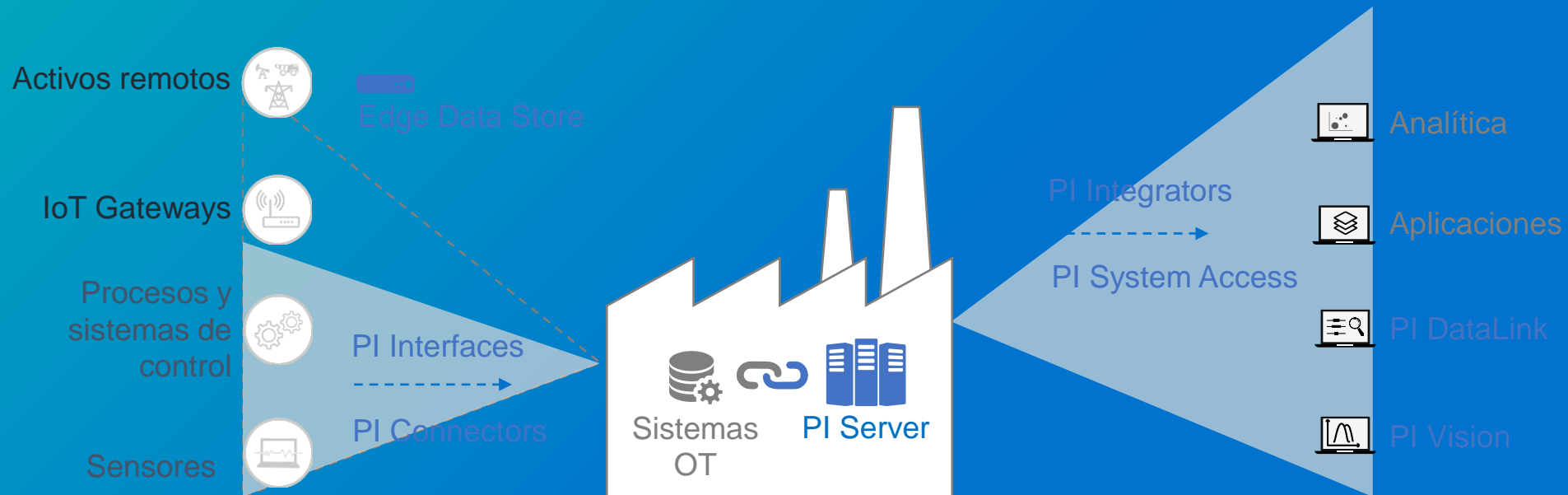
**Reportes BI y tableros de PI Vision**  
Incorporando predicciones de ML

No redescubra lo que ya sabe. Extiéndalo.

# A partir de base firme del software on-premise



# El PI System se extiende al edge para dar visibilidad a los activos remotos



# Por qué ir al edge: Datos valiosos a menudo abandonados



Más allá del alcance de los sistemas de automatización



Sujetos a condiciones de red inestables



En ambientes demasiado duros para las PCs tradicionales

Qué:

# Edge Data Store: Edge computing para IoT industrial

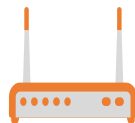
Software que



Empodera usuarios **en el campo**

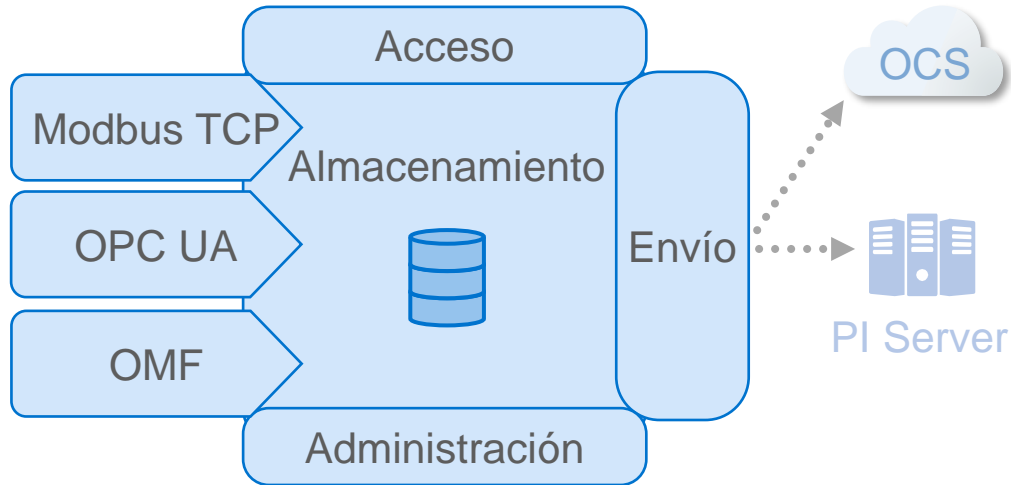


Ofrece configuración flexible para **optimizar ancho de banda**



Soportado en **dispositivos robustos** y de bajo costo *a menudo Linux*

Cómo:  
EDS provee entrada,  
almacenamiento y salida de  
datos de forma **ligera**



Ahora puede

**Enriquecer** datos existentes con información que solía ser demasiado difícil alcanzar.

**Acondicionar fácilmente** activos y controladores antiguos para soportar edge analytics.

- Diseño ajustado para el edge
- Conectividad configurable
- Hasta 3.000 streams de datos

# Obtener Visibilidad de Activos Críticos Remotos

Edge Data Store

## Desafío

Bombas antiguas continúan operando en el campo, pero los controladores originales no tienen capacidad para alojar diagnósticos avanzados.

## Solución

Despliegue de EDS dentro de contenedores Docker corriendo Linux y exposición de datos a aplicaciones de diagnóstico locales via API. Subconjunto de datos enviados a PI.

## Beneficios

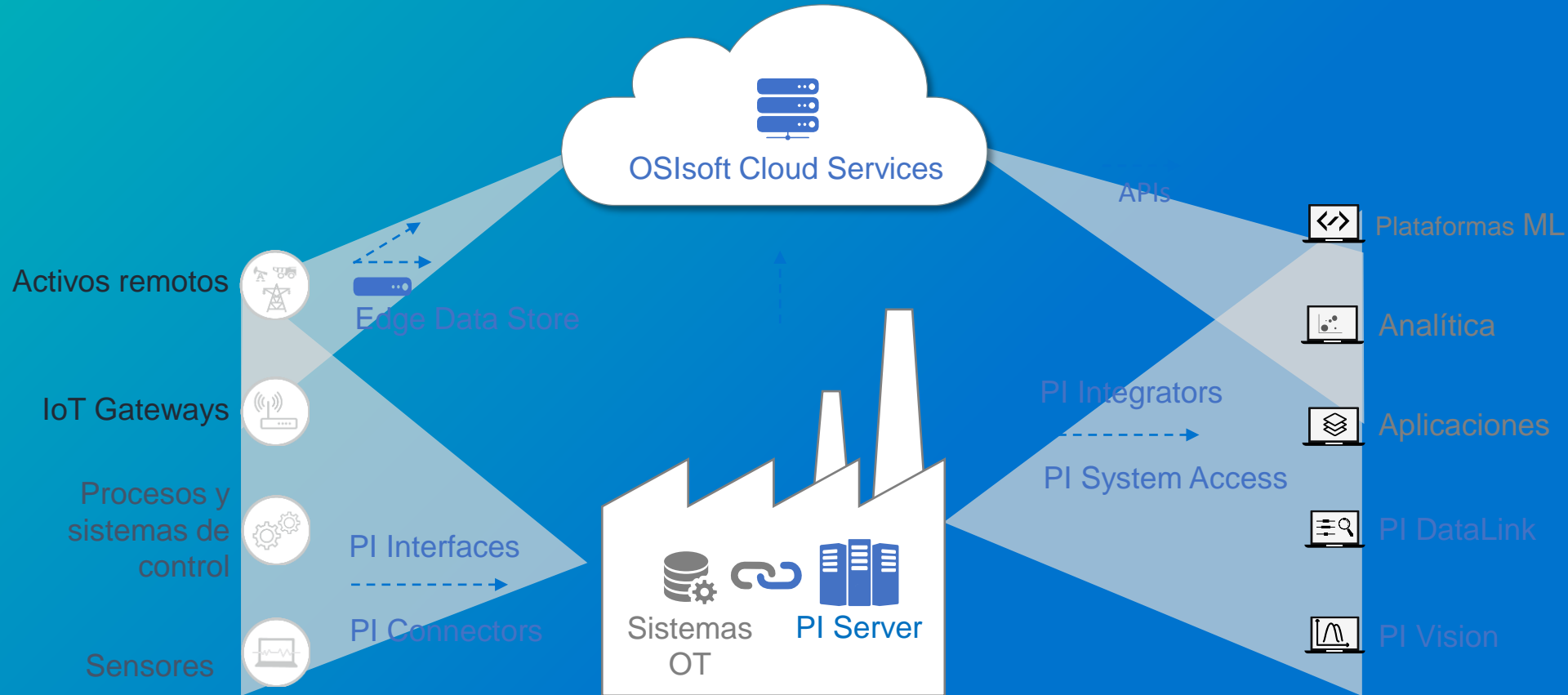
Incremento de eficiencia operacional y vida útil de bombas. Mejor transferencia de datos reduce costos de transmisión y latencia de alertas.

# Ahora tomando las capacidades on-premise y edge





# Aprovechando la elasticidad de la Nube



# Por qué la adopción ha sido lenta?

## La Nube no fue diseñada para **operaciones industriales**



Incapaz de exponer datos desde la red de control



Requiere un equipo IT dedicado



Requiere mucho tiempo construir y administrar una solución completa

# Qué: OSIsoft Cloud Services

## Plataforma de datos como servicio



Se integra nativamente con  
PI Server y Edge Data Store

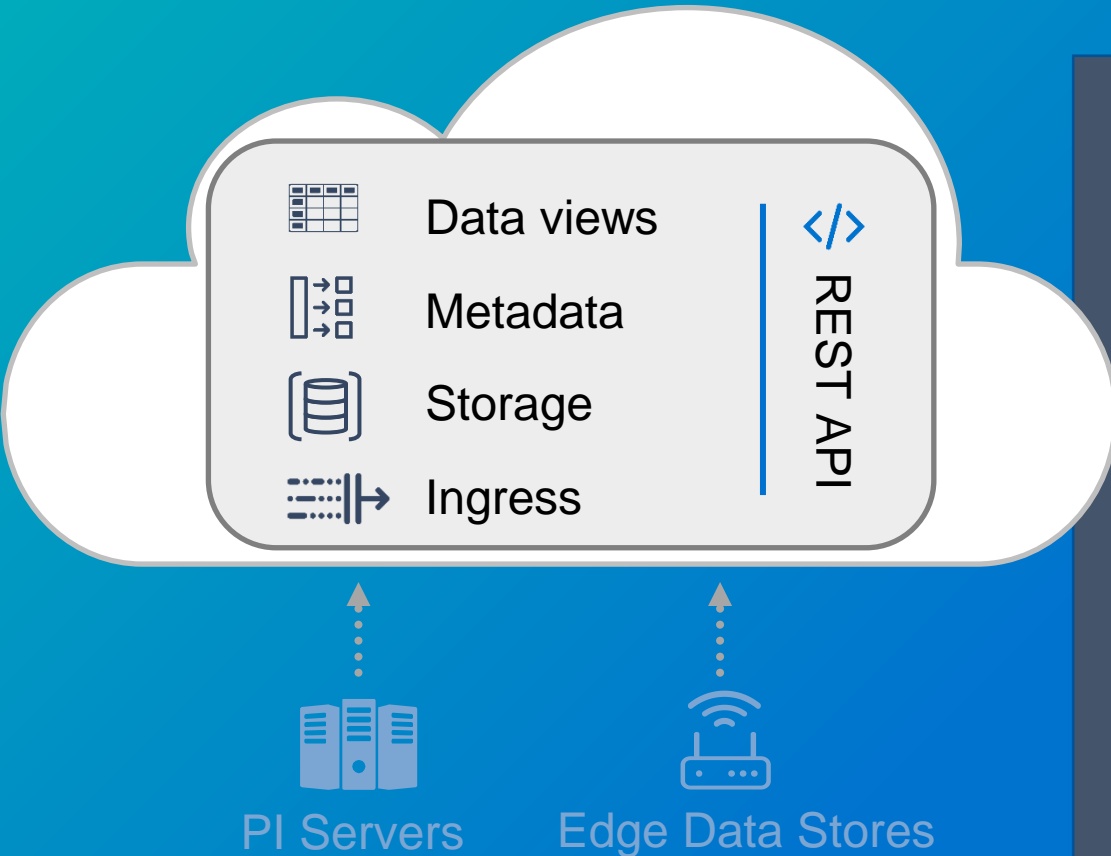


Entrega una experiencia de  
usuario configurable



Permite a los usuarios  
interactuar con datos, no con  
microservicios

# Cómo: OCS agrega y expone datos para un nuevo valor



## Ahora puede

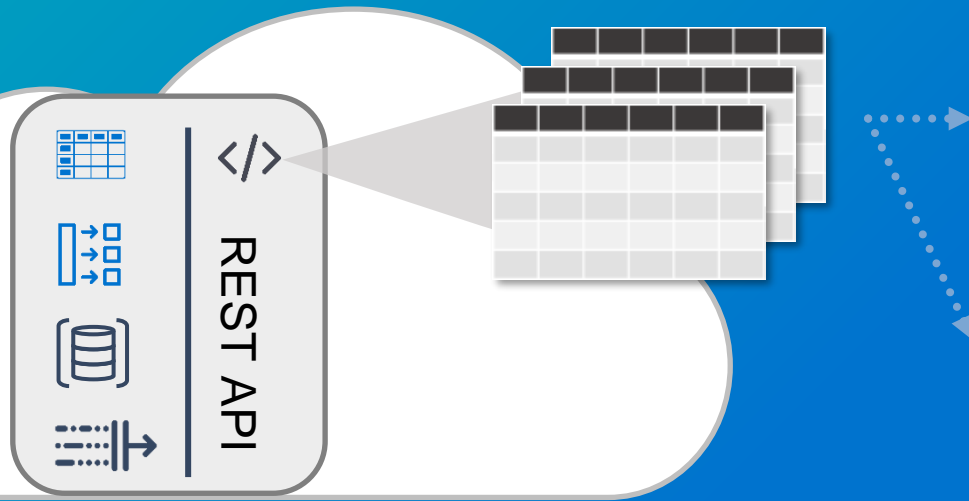
**Simplificar** el acceso seguro a sus datos en un sólo lugar

**Consultar** grandes conjuntos de datos en forma tabular aumentados con metadatos

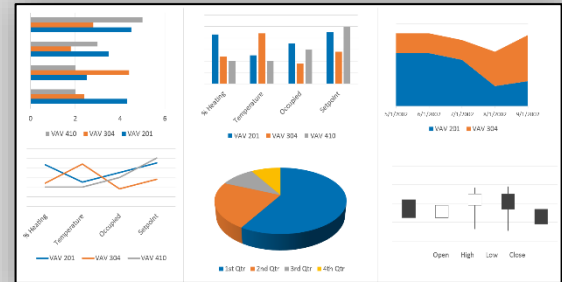
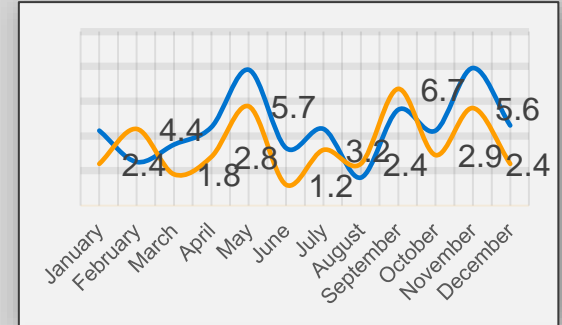
**Impulsar** proyectos de analítica con datos confiables y en contexto

# NUEVO! Data views y metadata rules para normalizar datos

*Dar formato a los datos para ser consumidos fácilmente por científicos de datos y herramientas de ML*



## 3<sup>rd</sup>-Party Tools



# Prediciendo Algas Nocivas

Ciudad de Salem + OSIsoft Cloud Services (OCS) +  
CASNE Engineering + The Prediction Lab (TPL)

## Desafío

Algas nocivas amenazan el agua potable de la Ciudad de Salem. El susto de 2018 dejó estantes vacíos de agua. Muestras manuales requieren 2 h manejo y \$1.000 /muestra

## Solución

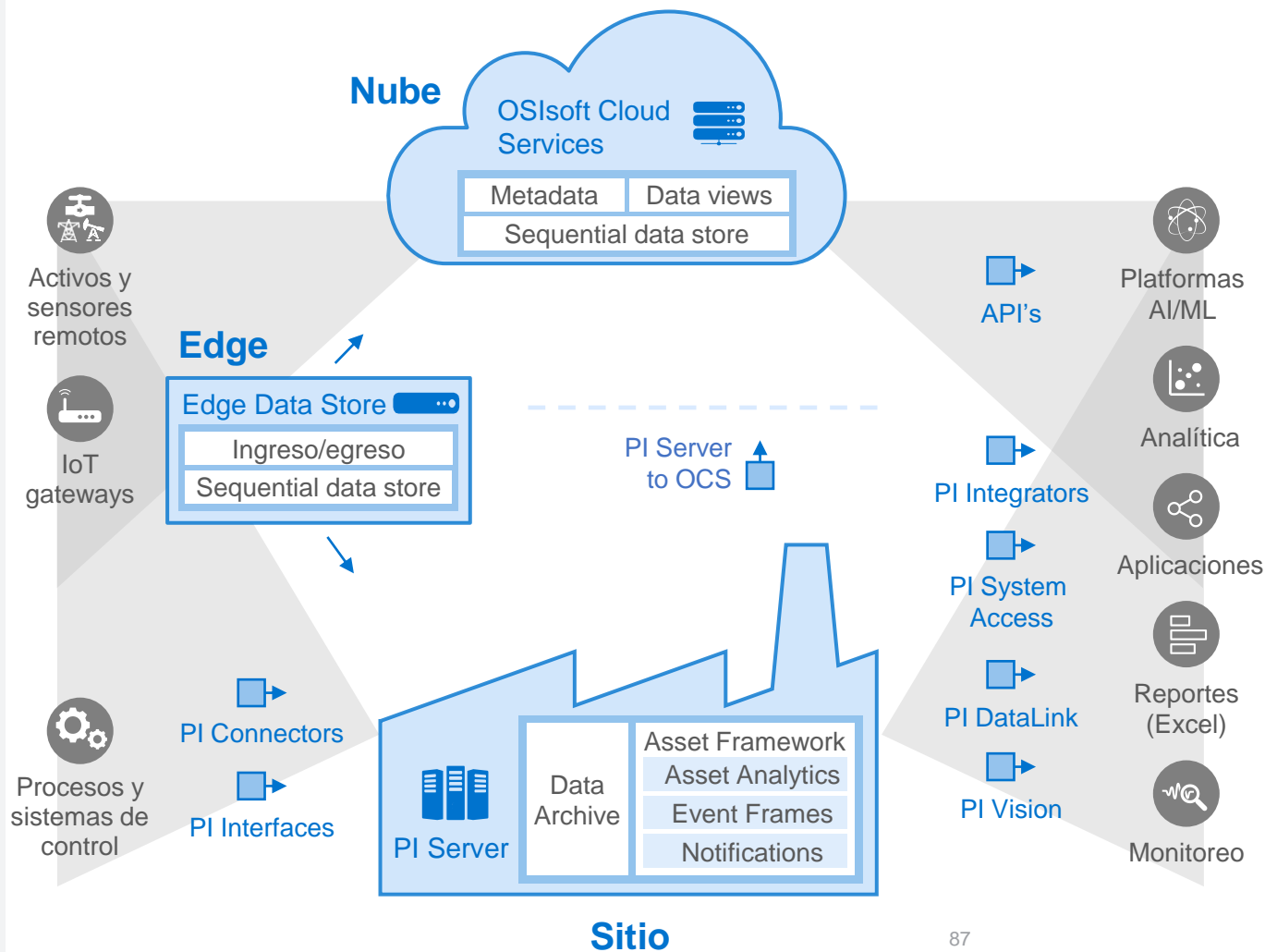
PI System desplegado para coleccionar datos de laboratorio, clima y tratamiento. CASNE Engineering integró imágenes satelitales. OCS usado para compartir datos.

## Resultados

The Prediction Lab (TPL) usó los datos compartidos para generar un modelo predictivo para encontrar antes eventos y ciclos de AN. Ganancia de tranquilidad y no más sorpresas en la calidad del agua. Bases para hacer preguntas más importantes como el impacto del cambio climático.

# El PI System se expande

- Alcanzando **nuevos datos**
- Alcanzando **nuevos usuarios**
- Habilitando **nuevo valor**





# Su base digital impulsa la inteligencia continua

- Acelerando el recorrido de la analítica
- Tendiendo puentes entre IT y OT
- Alineando estrategias corporativas con las operaciones diarias
- Proveyendo agilidad digital para prosperar en un ambiente dinámico

¿Qué valor crearás hoy?



# GRACIAS

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# THANK YOU



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