

AVEVA PI WORLD

Visualizing PI Server data

Utilizing new capabilities of PI Vision for users and administrators

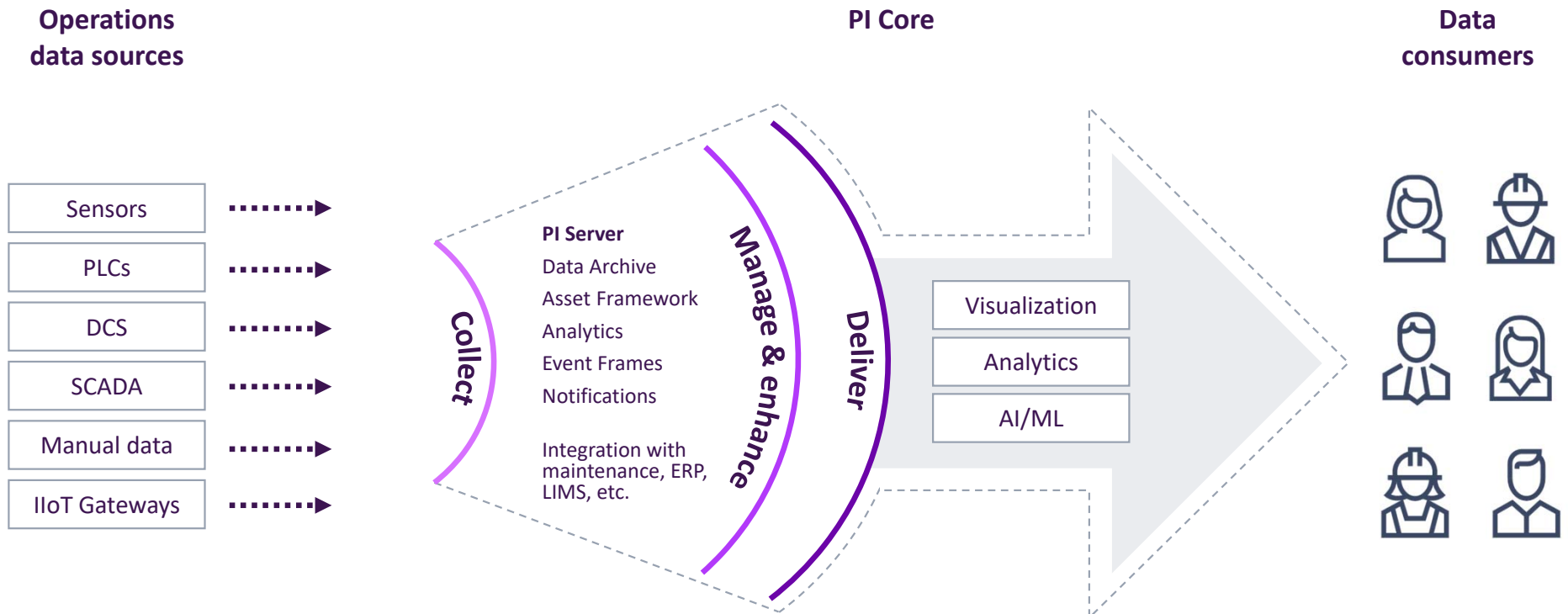
Presented By:

Dmytro Panchenko
John Swartzentruber
Sasha Krivosova

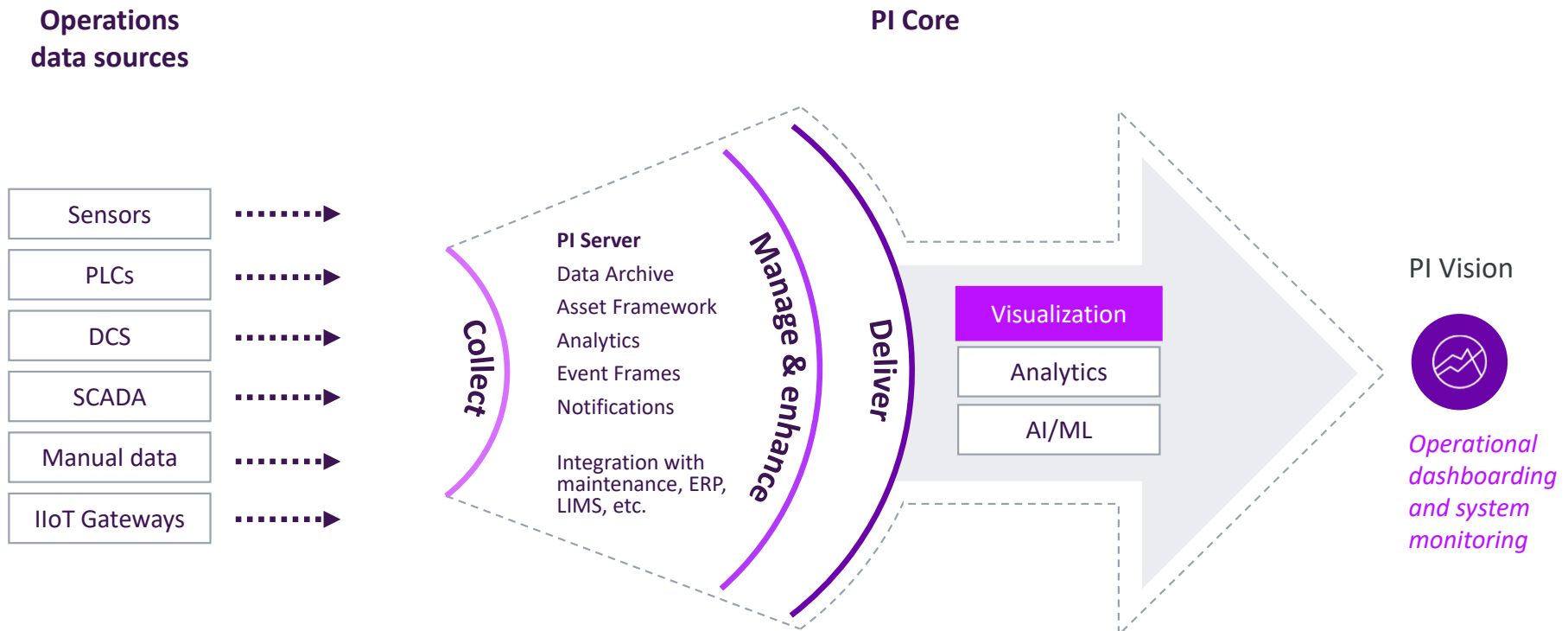
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Operations data infrastructure



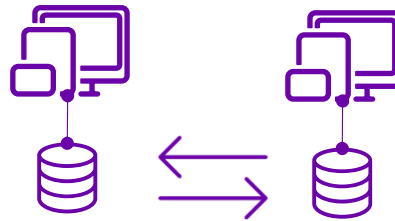
Visualization with operations data infrastructure



You will learn about:



Improved PI Vision UI
with new symbols and
asset-based calculations

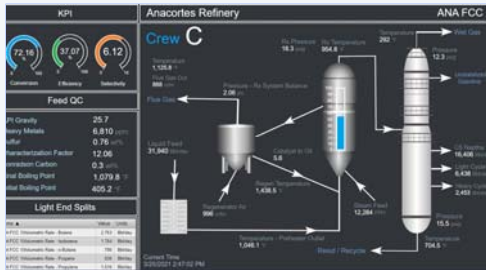


Offline Display Management
using the *PI Vision Display
Utility* and a new *Public API*

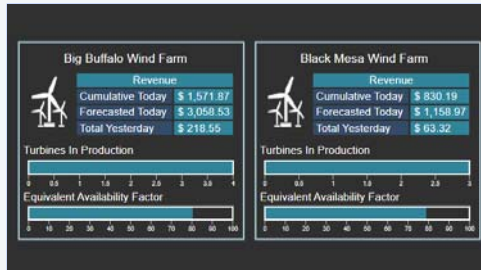


Administrative
improvements
in PI Vision

PI Vision: Real-time, self-service, scalable, actionable intelligence



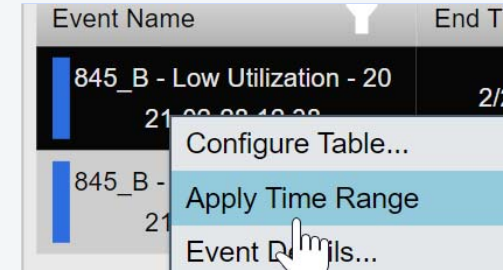
Real-time operational dashboarding



Enterprise-level dashboarding



Dynamic templated asset representation



Event-contextualized visualization



Integration point for real-time KPIs and engineering/meta data



Native visualization platform for Notifications



Smart drill-in navigation driven by AF hierarchy



Mobile-friendly

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Improved PI Vision User Experience

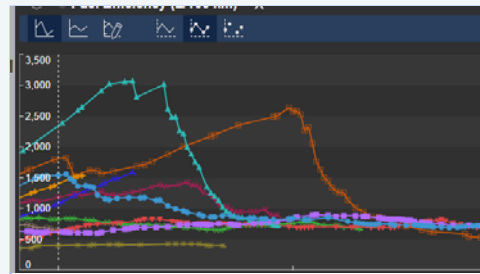
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PI Vision 2021: New Capabilities

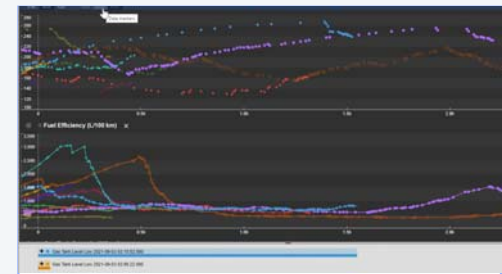
Asset-based calculations

HIGH TEMPERATURE EVENTS			
Asset	End Time	Generator 1 Temperature	Bearing A Temp
emp_GE01_2020-14.755	In Progress	72.109	
emp_GE01_2020-10.887	In Progress	66.029	
emp_GE01_2020-18.109	In Progress	60.59	
emp_GE01_2020-9.669	In Progress	60.945	
emp_GE01_2020-10.165	In Progress	75.283	
emp_GE01_2021-13.063	In Progress	73.395	

Attribute visualization in Event Frame tables

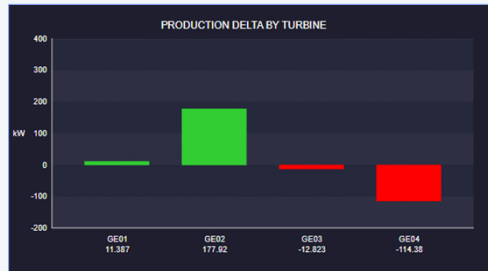


Revamped event details visualization



Enhanced event comparison visualization

Snap-to-grid



Bar charts

Path visualization in asset context switching

Name	Value
Compressor001 Name	Compressor001
Compressor001 Last Service Date	10/28/2016 12:00:00 AM
Compressor001 Maintenance Reason	Compressor PM/Inspection, semi-annual

Text wrap in table symbol



PI Vision UI DEMO

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Demo

PI Vision User Experience



- Bar charts
- AF-based calculations with support of dynamic search criteria



Demo

PI Vision User Experience

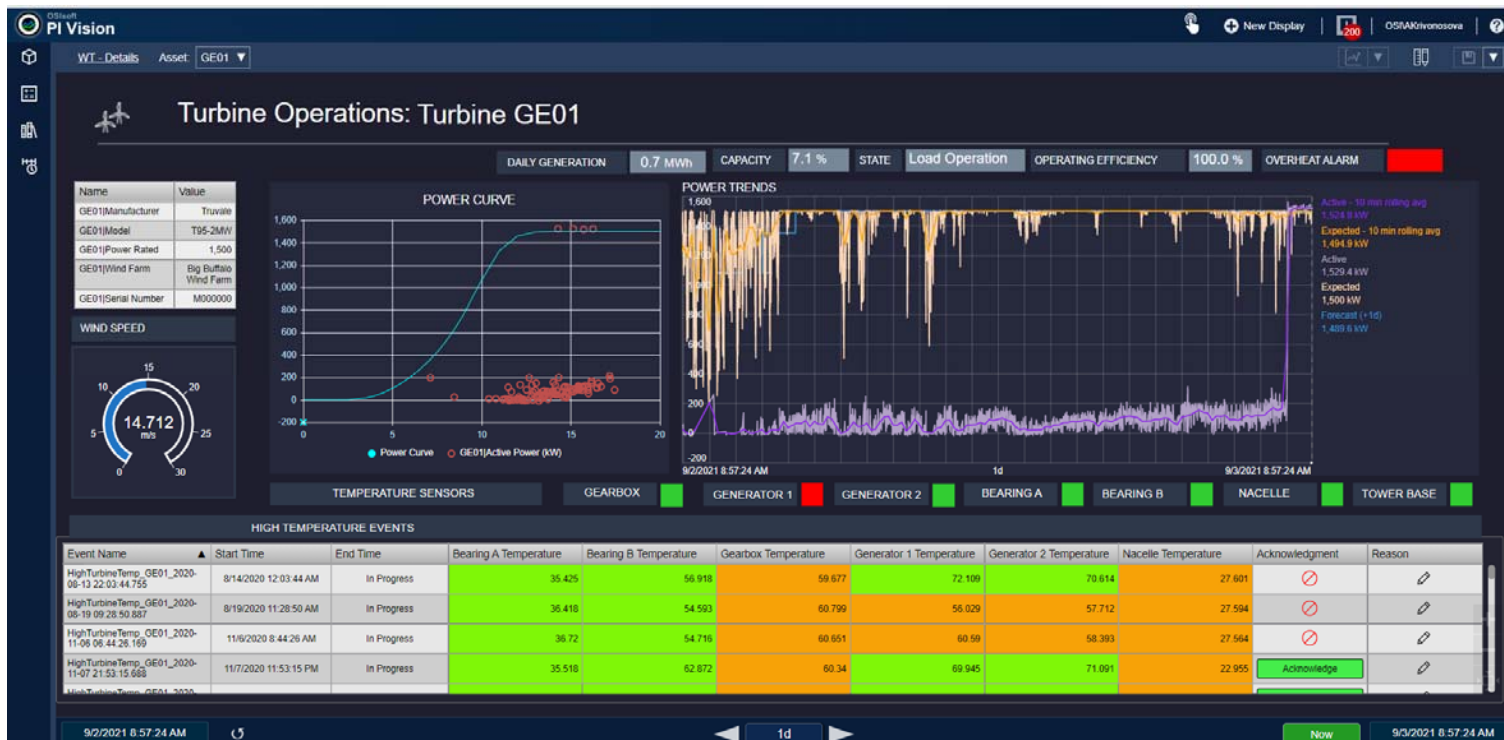


Symbol functionality and usability:

- Event attributes in tables
- Asset swap path

Editor improvements and formatting:

- Snap-to-grid
- Wrap text in tables

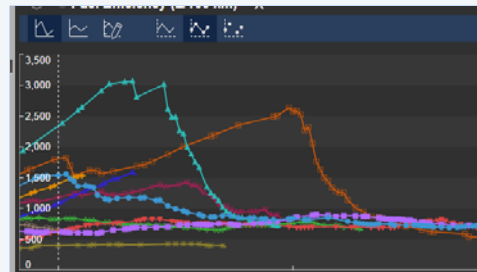


PI Vision 2021: New Capabilities

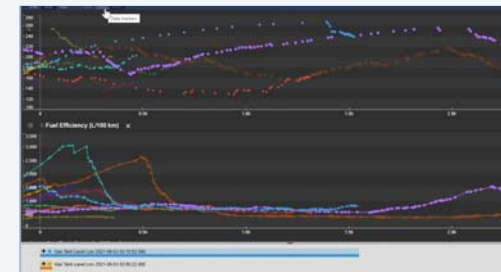
Asset-based calculations

	End Time	Generator 1 Temperature	Bearing A Temp
emp_GE01_2020-14.755	In Progress	72.109	
emp_GE01_2020-10.887	In Progress	66.029	
emp_GE01_2020-18.109	In Progress	60.59	
emp_GE01_2020-19.669	In Progress	60.945	
emp_GE01_2020-10.166	In Progress	75.283	
emp_GE01_2021-13.063	In Progress	73.395	

Attribute visualization in Event Frame tables

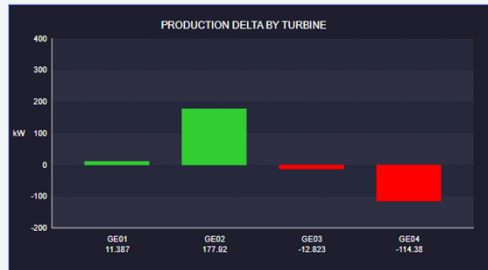


Revamped event details visualization



Enhanced event comparison visualization

Snap-to-grid



Bar charts

Path visualization in asset swap

Name	Value
Compressor001 Name	Compressor001
Compressor001 Last Service Date	10/28/2016 12:00:00 AM
Compressor001 Maintenance Reason	Compressor PM/Inspection, semi-annual

Text wrap in table symbol



Display management API

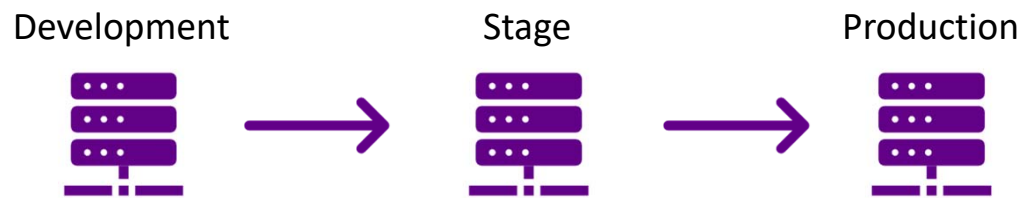




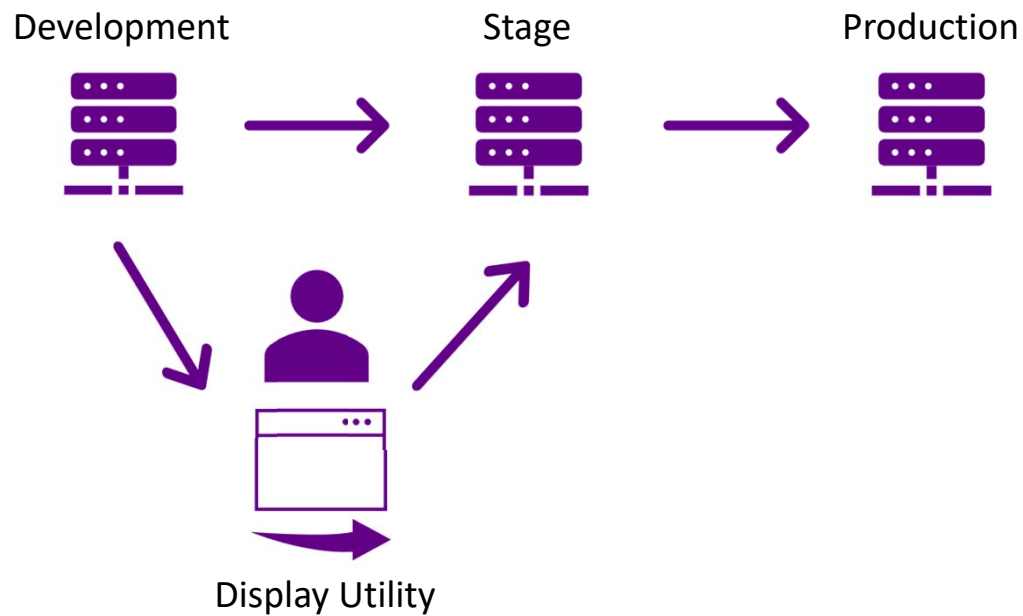
Display migration and API

- New scenarios
 - Continuous integration / continuous delivery
 - Offline Display Management
 - Interoperability
- Demo

Continuous integration / continuous delivery

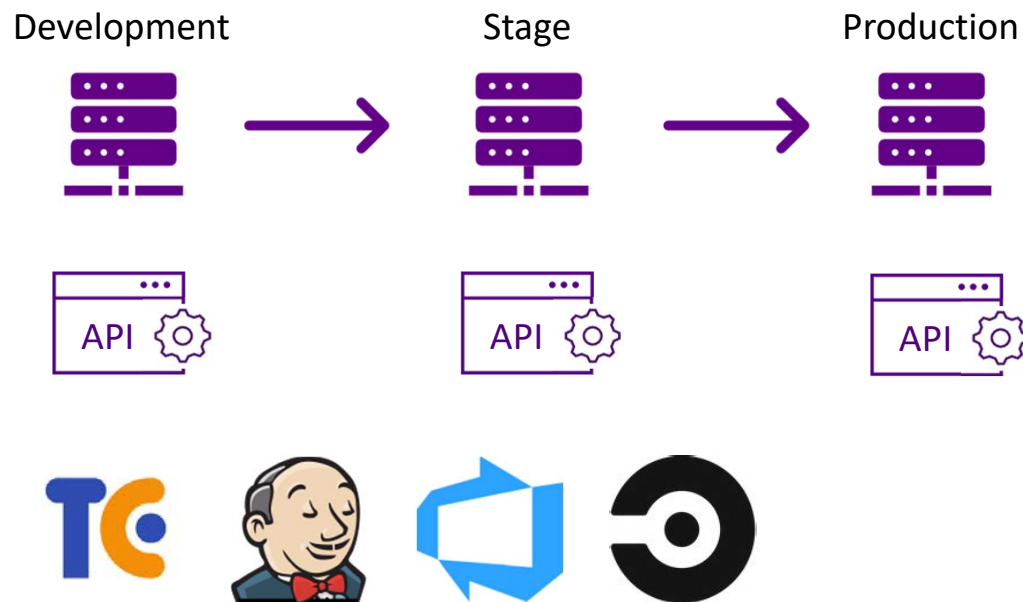


Continuous integration / continuous delivery



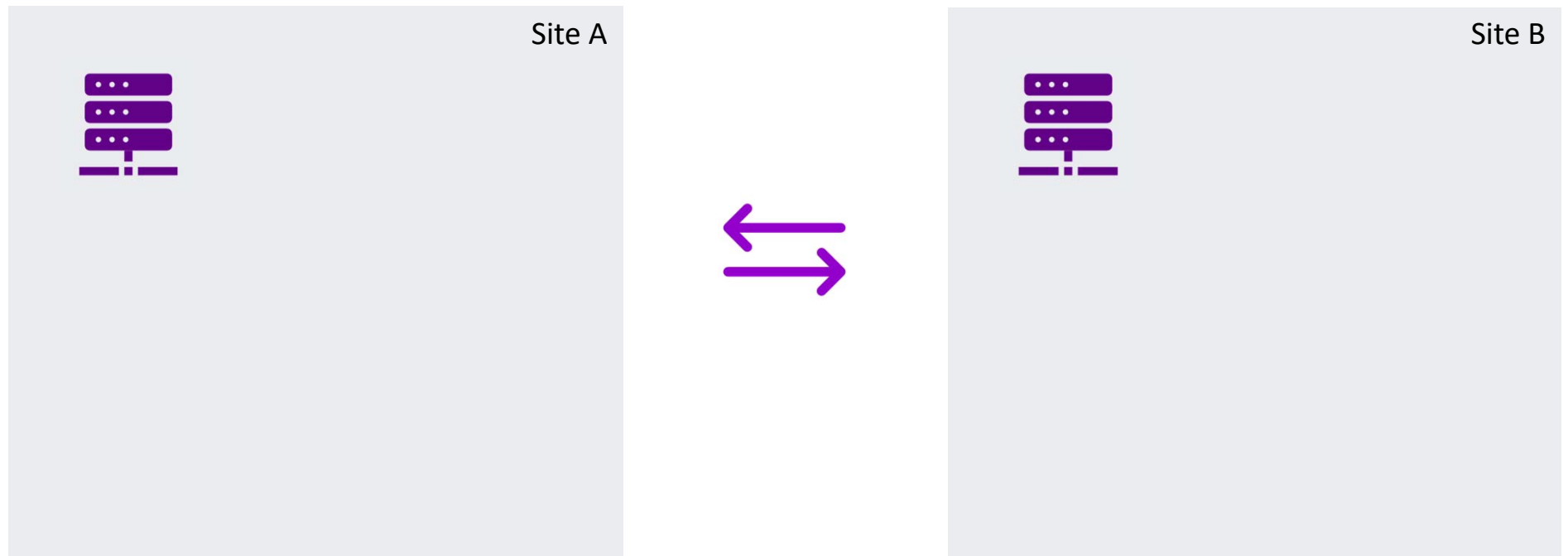
- Error prone
- Requires an operator

Continuous integration / continuous delivery

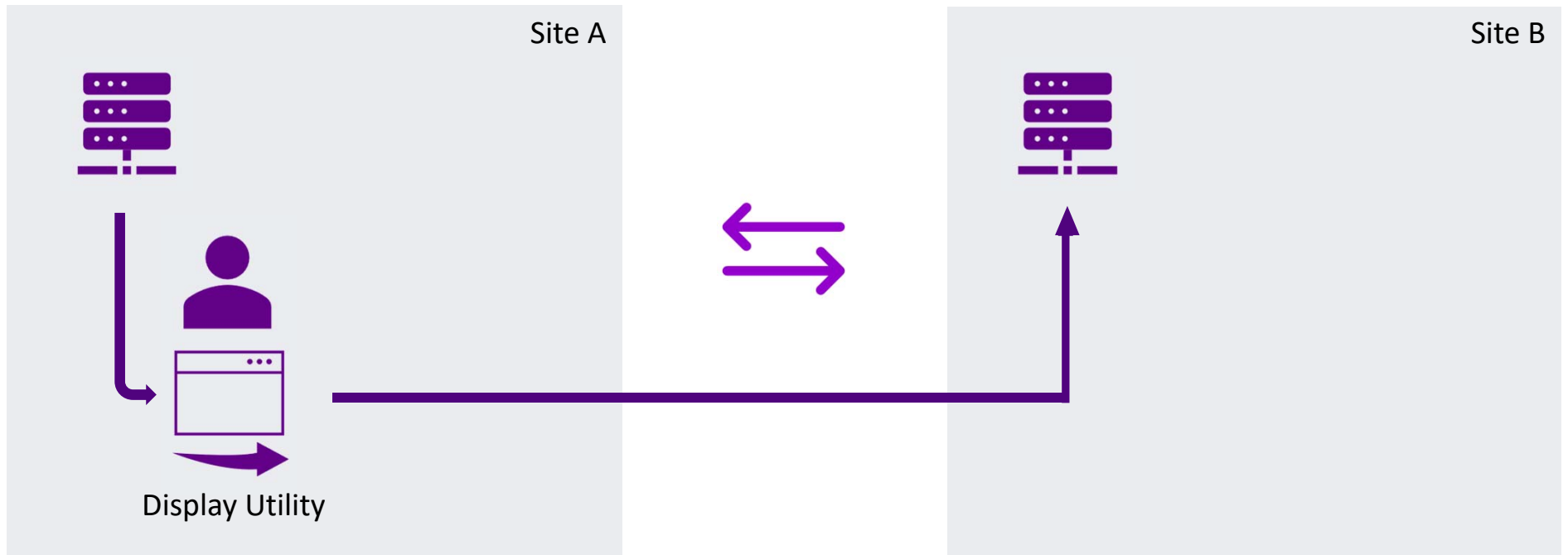


- JSON/XML as data formats
- REST API – easy to integrate with modern CI/CD tools

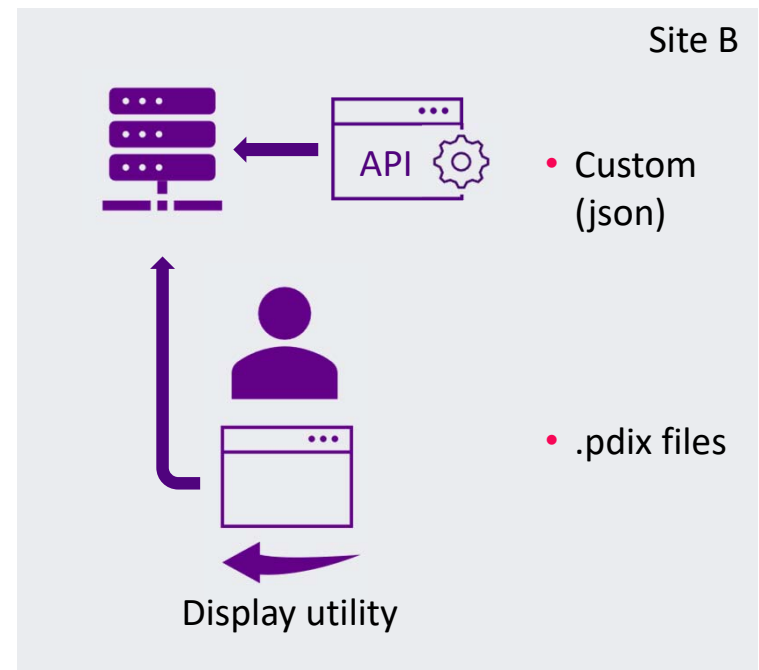
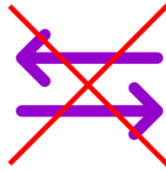
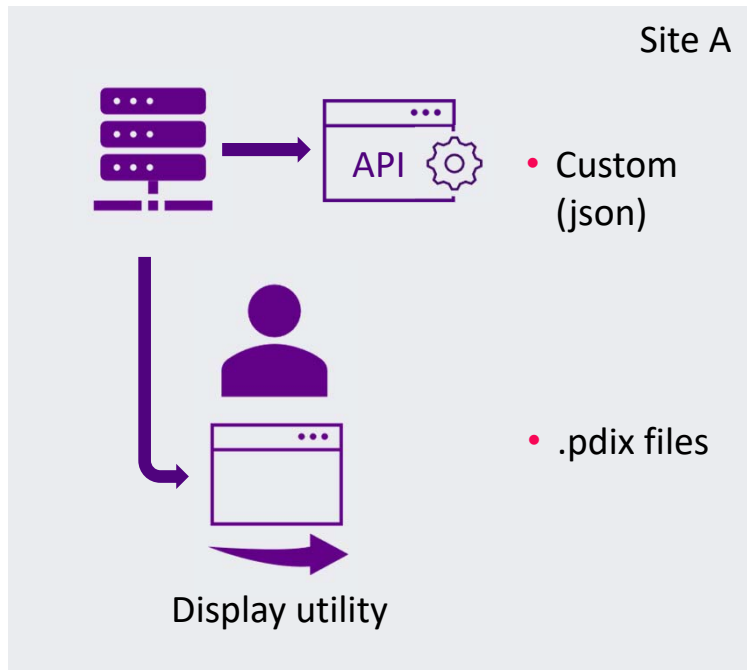
Offline Display Management



Offline Display Management

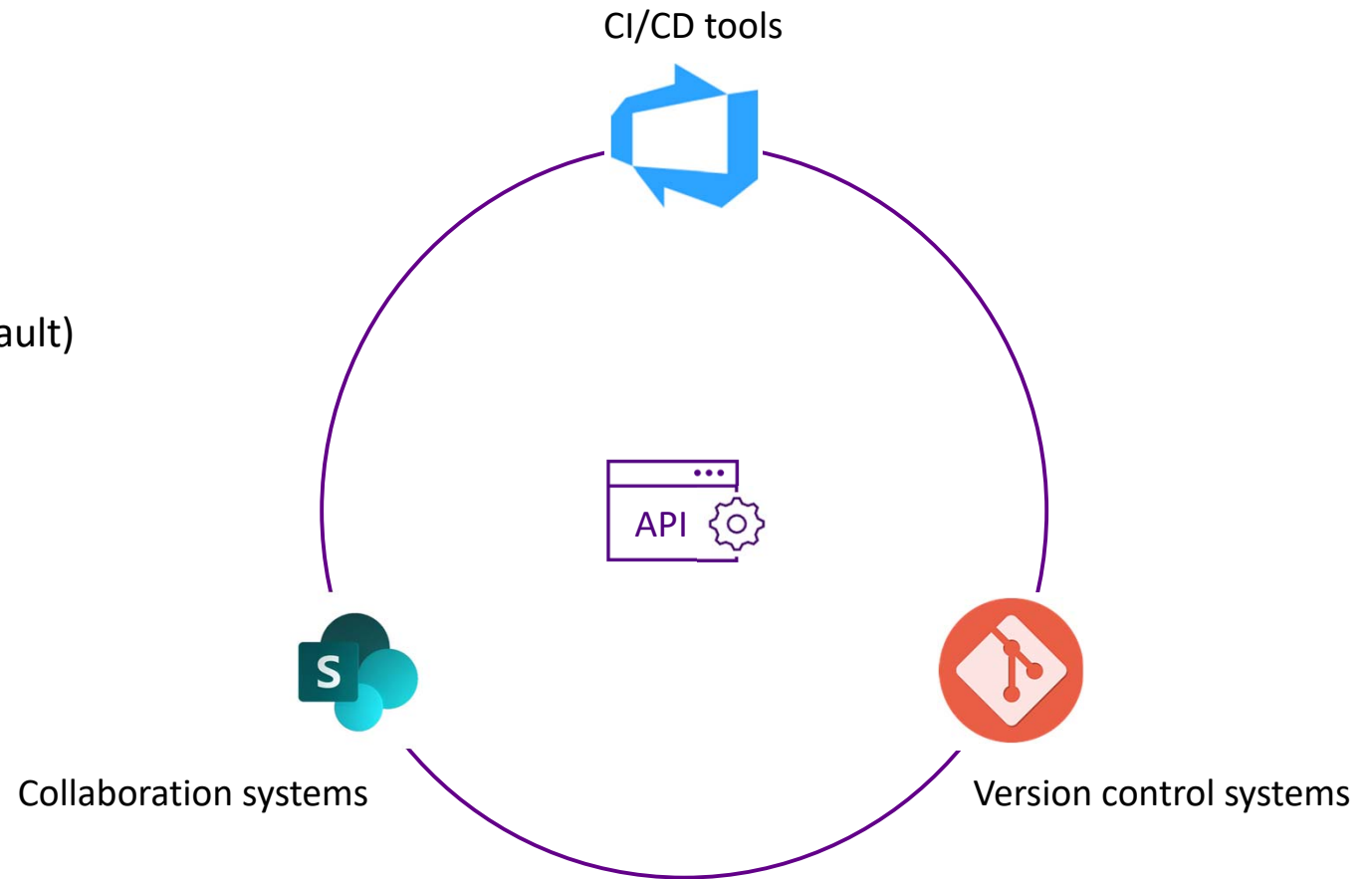


Offline Display Management



Interoperability

- REST API
- NTLM authentication (by default)
- JSON/XML as payload



Offline Display Management

Demo

Moving displays between servers using PowerShell scripts





Manageability

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PI Vision Calculations Best Practices

- Use PI Vision calculations for ad hoc analysis and one-off calculations
- Move a calculation into an analysis in your asset hierarchy when
 - The calculation is used in multiple PI Vision displays
 - The calculation requires many data points or long time periods
 - You need to use the attribute in a search filter
- Write an analysis to an AF attribute that uses a PI Point data reference so that the PI Analysis Service runs the analysis and its output history is stored by the PI Data Archive.

Calculation usage report demo

Calculations report

	A	B	C	D	E	F	G	H	I
1	Type	Name	Description	Expression	Context	Interval	Display	Display Name	Use Count
2	AF	AF Calc		'Site Stress Average Score' + '\HOU.Press.01\Steam Inlet'	\\AFServer\CSPI PI Big Tire Co\Houston	Auto	13831	calc badge test	1
3	AF	AF Calc		'Pressure' + 'Mold Temperature' + 'Internal Temperature'	\\AFServer\Big Tires Co\Houston\HOU.Press.01	Auto	14869	HOU.Press.01 Map AF Calc	1
4	AF	AF Units		Convert('Internal Temperature', "degF")	\\AFServer\CSPI PI Big Tire Co\Houston\HOU.Press.01	Auto	13904	Mixed Calculations	1
5	AF	AF_Both_1m		'OneDay_Forecast_1m' + 'cdt158'	\\AFServer\traits\JD_TestRoot\FutureData	1m	14790	Future calc float comparison	6
6	AF	AF_Both_Auto		'OneDay_Forecast_1m' + 'cdt158'	\\AFServer\traits\JD_TestRoot\FutureData	Auto	14790	Future calc float comparison	4
7	AF	AF_Future_1m		'OneDay_Forecast_1m'	\\AFServer\traits\JD_TestRoot\FutureData	1m	14790	Future calc float comparison	4
8	AF	AF_Future_Auto		'OneDay_Forecast_1m'	\\AFServer\traits\JD_TestRoot\FutureData	Auto	14790	Future calc float comparison	4
9	AF	AFBrakeTemp		'LF Brake Temperature'	\\AFServer\EF_MiningSim\OSIsoft Mining\Trucks\Mine Tru	Auto	13854	xyplot-tooltip	1
10	AF	af-calc-capacity		'Gas Tank Capacity'	\\AFServer\CSPI Speedys Pizza\Speedys Pizza\Vehicles\SP	Auto	13854	xyplot-tooltip	0
11	AF	af-calc-level		'Gas Tank Level'	\\AFServer\CSPI Speedys Pizza\Speedys Pizza\Vehicles\SP	Auto	13854	xyplot-tooltip	0
12	AF	AFTraits		'LR Brake Temperature'	\\AFServer\traits\Trucks\Mine Truck 2	Auto	13828	Calc_AllSymbols	5
13	AF	AFTraits		'LR Brake Temperature' * 2	\\AFServer\traits\Trucks\Mine Truck 5	Auto	13829	traittest	3
14	AF	AFTraits		'LR Brake Temperature'	\\AFServer\traits\Trucks\Mine Truck 1	Auto	13854	xyplot-tooltip	1
15	AF	calc		'Gas Tank Level' + 'Fuel Efficiency'	\\AFServer\CSPI Speedys Pizza\Speedys Pizza\Vehicles\SP	1h	13856	Calc into future	1
16	AF	ContextAncestorRenamed		'CDT158'	\\AFServer\traits\JD_TestRoot\RenamingTests\GrandParer	Auto	13864	JD_CalcRenameTest	1
17	AF	Delta Temperature Coefficient	A test calc	Sqr(Abs('Mold Temperature' - 'Internal Temperature')) / 2 * Pi()	\\AFServer\CSPI PI Big Tire Co\Houston\HOU.Press.01	Auto	13765	AF Calcs Single-value demo	0
18	AF	Double Production	Production times 2	'Total Good Production' * 2	\\AFServer\CSPI PI Big Tire Co\Houston	Auto	13880	Calcs in labels	1
19	AF	EngTemp		'Engine Temperature'	\\AFServer\CSPI Speedys Pizza\Speedys Pizza\Vehicles\SP	Auto	13875	NavLink_Test_Src	0
20	AF	ET1		'Engine Temperature' + 1	\\AFServer\CSPI Speedys Pizza\Speedys Pizza\Vehicles\SP	Auto	13805	assetswap	0
21	AF	Fuel Efficiency Calc		'Oil Level'	\\AFServer\CSPI Speedys Pizza\Speedys Pizza\Vehicles\SP	Auto	13746	First pass AF calcs	1
22	AF	Gas Amount		('Gas Tank Capacity' * 'Gas Tank Level')/100	\\AFServer\CSPI Speedys Pizza\Speedys Pizza\Vehicles\SP	Auto	13877	afCalcs-in-adhoc-url	1
23	AF	good tires		'Good Tires'	\\AFServer\CSPI PI Big Tire Co\Montreal\MTL.Press.02	Auto	13889	snapToGridDragDrop	0
24	AF	Good Tires plus 10		'Good Tires' + 10	\\AFServer\CSPI PI Big Tire Co\Houston\HOU.Press.03	Auto	13874	ACT_runtime02	1
25	AF	Good Tires plus 10		'Good Tires' + 10	\\AFServer\CSPI PI Big Tire Co\Houston\HOU.Press.03	Auto	13887	sort act new	1
26	AF	IntenseData_AFCalc		'IntenseData'	\\AFServer\traits\JD_TestRoot\JD_DigitalSetFormula	Auto	13809	IntenseData Calcs	1
27	AF	Internal Temp		'Fuel Efficiency'	\\AFServer\CSPI Speedys Pizza\Pizza Inc\King of Prussia\SF	Auto	13806	Calc trend failed	1
28	AF	Oil Pressure (calculated)		'Engine Temperature' * 'Oil Level'	\\AFServer\CSPI Speedys Pizza\Speedys Pizza\Vehicles\SP	Auto	13877	afCalcs-in-adhoc-url	1
29	AF	Sinusoid_Scaled		'Sinusoid' * 100	\\AFServer\traits\JD_TestRoot\DR Timestamps	Auto	13796	Compare calc XY	1
30	AF	TankCapacity		'Capacity'	\\AFServer\QASystemTest\Test Rename Element\Shashi T.	Auto	13828	Calc_AllSymbols	1
31	AF	TankCapacity	Desc with . and * dot	'Capacity'	\\AFServer\QASystemTest\Test Rename Element\Shashi T.	Auto	13859	td_ren1	1
32	AF	Temp		'Internal Temperature'	\\AFServer\CSPI PI Big Tire Co\Houston\HOU.Press.04	Auto	13793	Calc Asset Swap	1
33	AF	Temp plus 3		'Internal Temperature' + 3	\\AFServer\CSPI PI Big Tire Co\Montreal\MTL.Press.03	Auto	13778	AFDragDropReview	1

Disabling calculation creation or evaluation

A configuration setting named **CalculationBehavior** is available in the `dbo.Settings` table

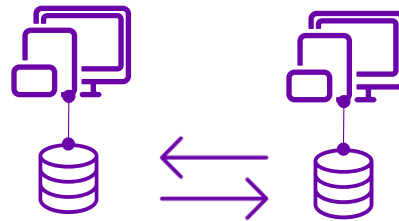
- *Enable* (default)
 - Both asset-based calculations and PI point calculations are fully available
- *ExecuteOnly*
 - Existing calculations, including all data sets in PI ProcessBook displays, are evaluated. No new calculations can be added. Existing calculations cannot be edited or added to symbols.
- *Disable*
 - All calculation expression evaluation is disabled, including PI Expression data sets in PI ProcessBook displays. PI Summary data sets continue to be evaluated. Existing calculations are not removed but return “No Data” when evaluated.

Enhancements that benefit the entire organization



UI improvements for a better User Experience

- Asset-based calculations
- Event Frame visualization improvements
- Bar charts
- Snap-to-grid
- And more!



New Display Management

- Continuous integration / continuous delivery
- Offline Display Management
- Interoperability



Manageability

- Reporting
- Server-level configuration for calculations

Slide 27

RV1 Kind of generic, but hows that?

Also could do "Enhance your visualziation experience"

Rohan Vettiankal, 9/7/2021

SK1 Perfect! Thank you :)

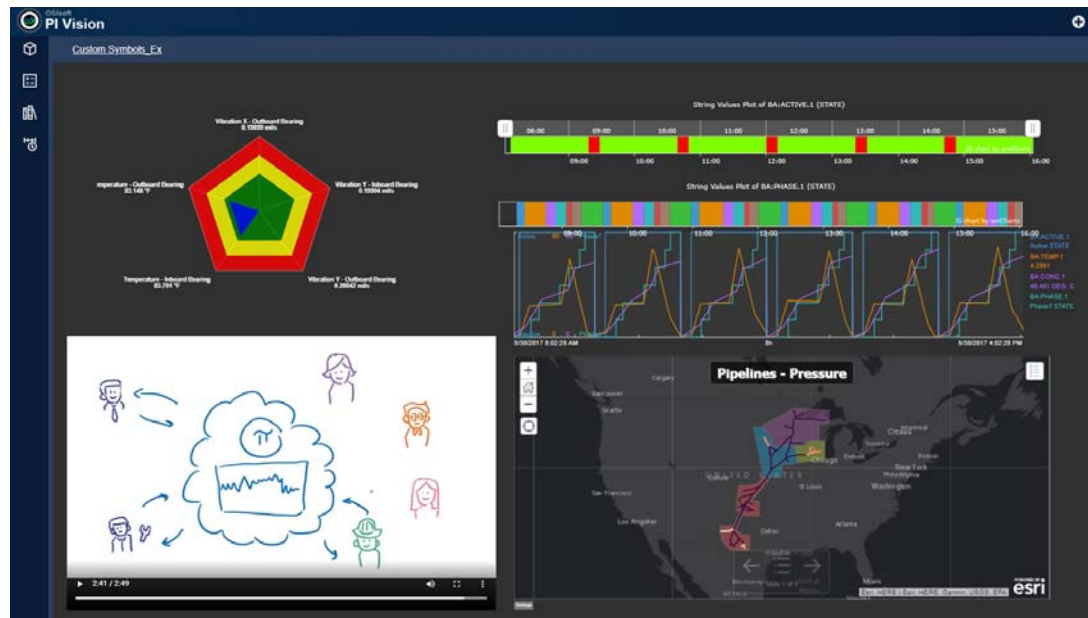
Sasha Krivonosova, 9/7/2021

Learn more about PI Vision

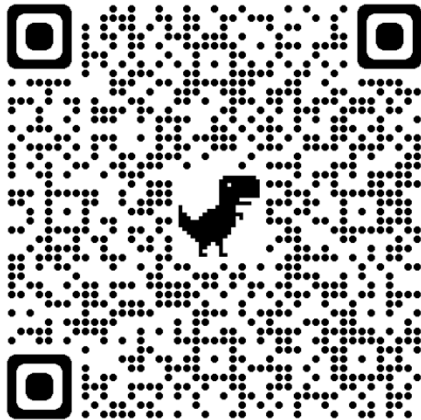
PI Vision Basics on [OSIsoft Learning Channel](#) ●→



Learn more about PI Vision Extensibility



PI Vision Extensibility documentation on [GitHub](#)





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THANK YOU

謝謝

DZIĘKUJĘ CI NGIYABONGA TEŞEKKÜR EDERIM DANKIE TERIMA KASIH SPASIBO GRAZIE MATUR NUWUN ХВАЛА ВАМ MULTUMESC PAKMET CIZGE 고맙습니다 GRAZIE شكرا FAAFETAI ESKERRIK ASKO HVALA HVALA TEŞEKKÜR EDERIM OBRIGADO MERCI DI OU MÈSI ĎAKUJEM

KÖSZÖNÖM GO RAIBH MAITH AGAT БЛАГОДАРЯ GRACIAS ТИ БЛАГОДАРАМ TAK DANKE RAHMAT HATUR NUHUN PAXMAT CAҒA CẢM ƠN BẠN WAZVIITA FALEMINDERIT

TAPADH LEIBH KEA LEBOHA MISAOTRA ANAO WHAKAWHETAI KOE DANKON TANK TAPADH LEAT SALAMAT

GRACIES

MAHADSANID

ЕΥΧΑΡΙΣΤΩ GRATIAS TIBI

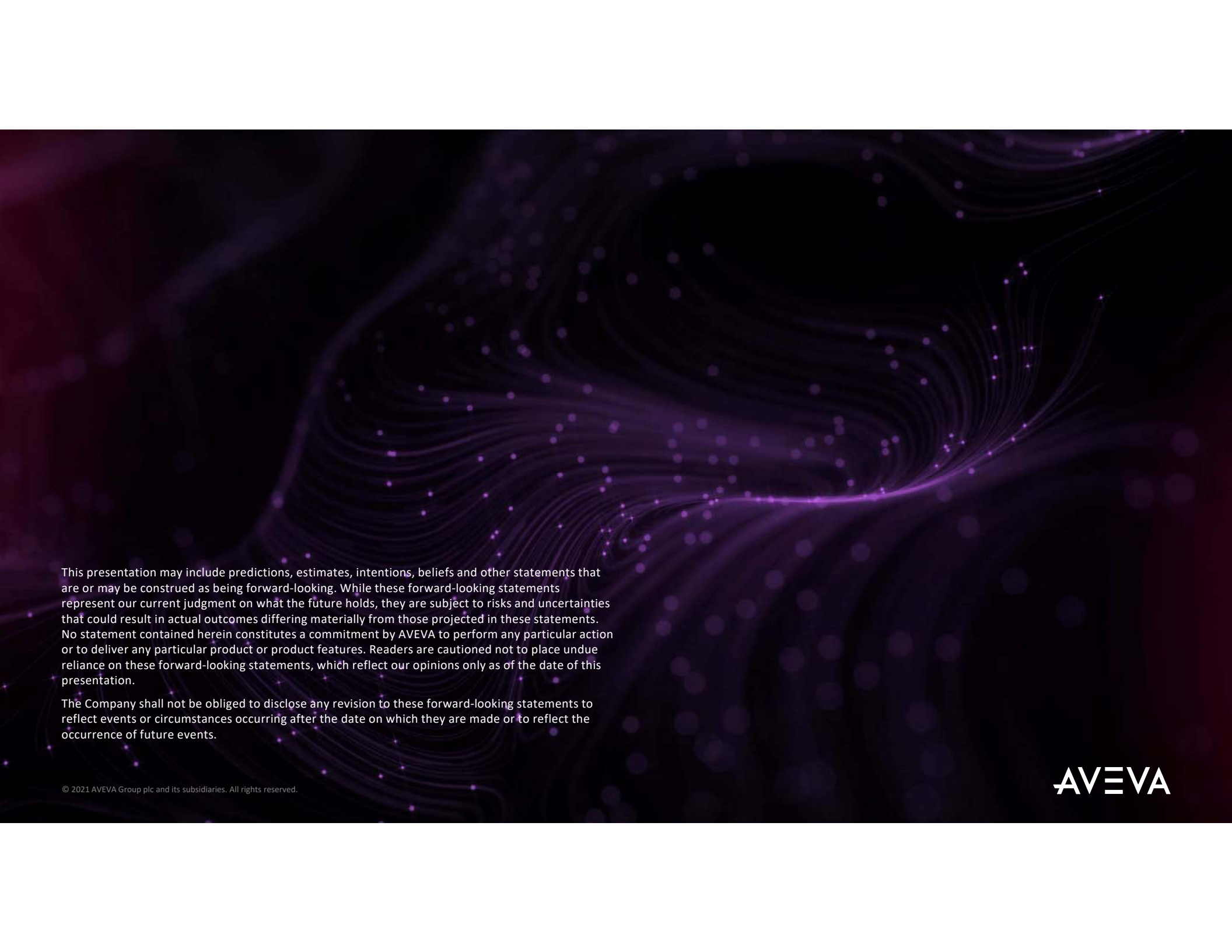
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GRAZZI PAKKA PÉR

SIPAS JI WERE TERIMA KASIH

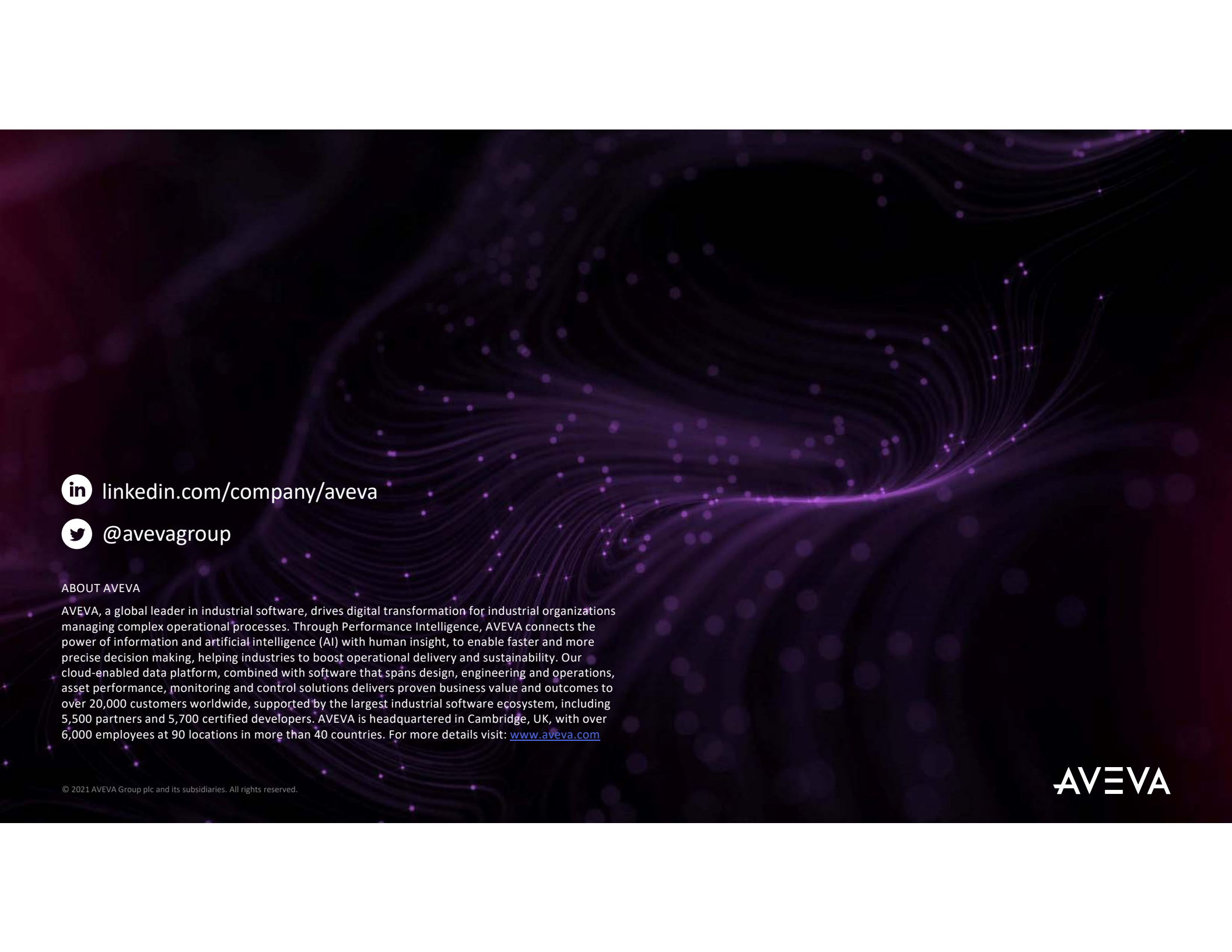
UA TSAUG RAU KOJ

ТИ БЛАГОДАРАМ СИПОС



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