

The Case for TEVA Pharmaceutical

Presented by **László Simon**



Agenda

- About TEVA
- Challenges
- Meeting with PI System
- Solution and Application examples
 - PI DataLink (Excel Add-Ins)
 - PI Batch Generator (PIBaGen)
 - PI ProcessBook
- Benefit
- Future Opportunities
- Conclusion

TEVA – TAPI Worldwide: 20 Sites



TEVA Hungary



Debrecen

Area: 230 000 m²

Main activities: solid dosage form & API production, R&D activities



Sajóbáony

Area: 35 000 m²

Main activity: API production



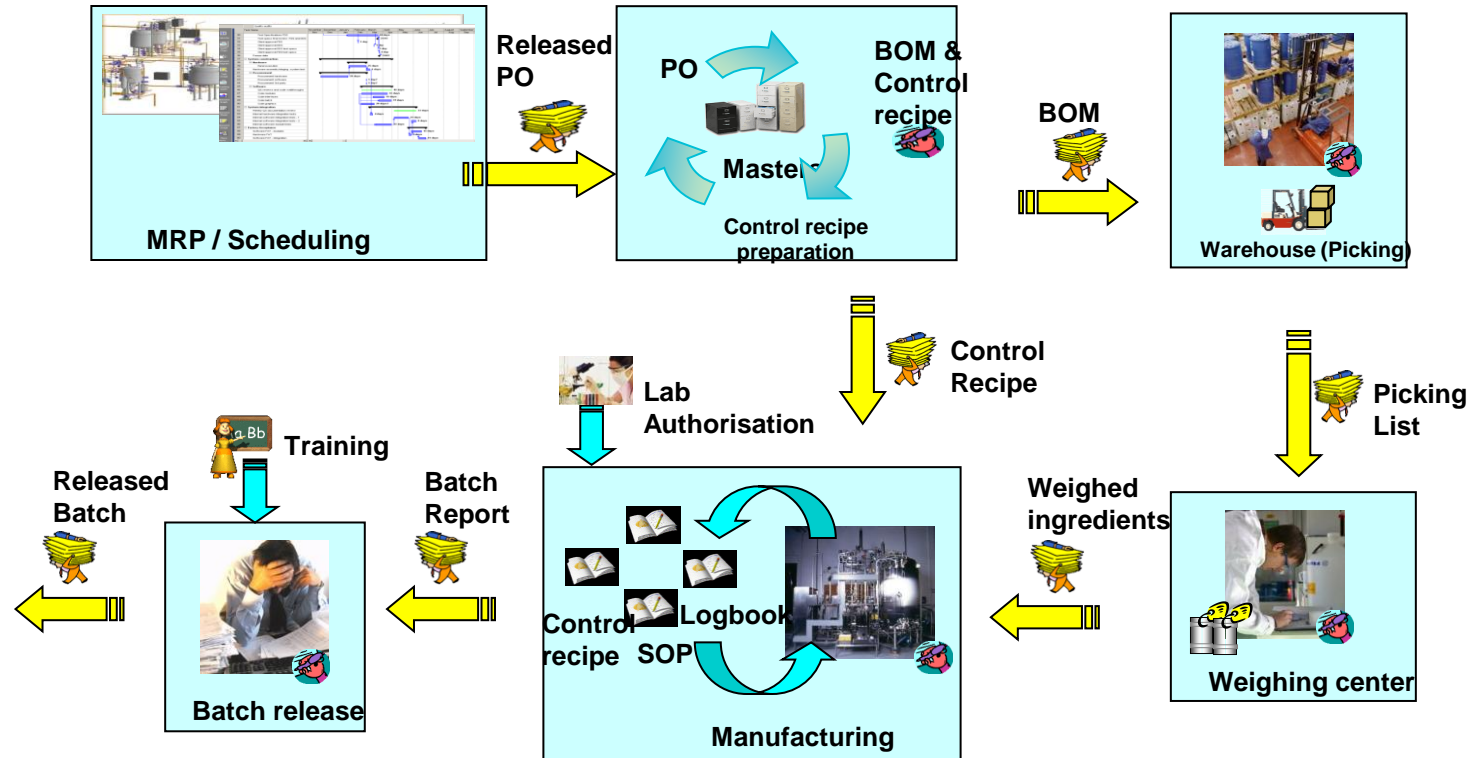
Gödöllő

Area: 207 000 m²

Main activities: sterile production, R&D activities



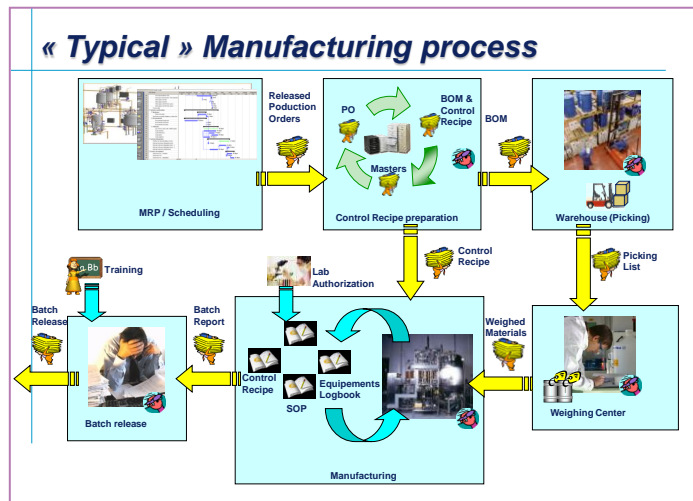
Challenges – Regulated Industry



Challenges

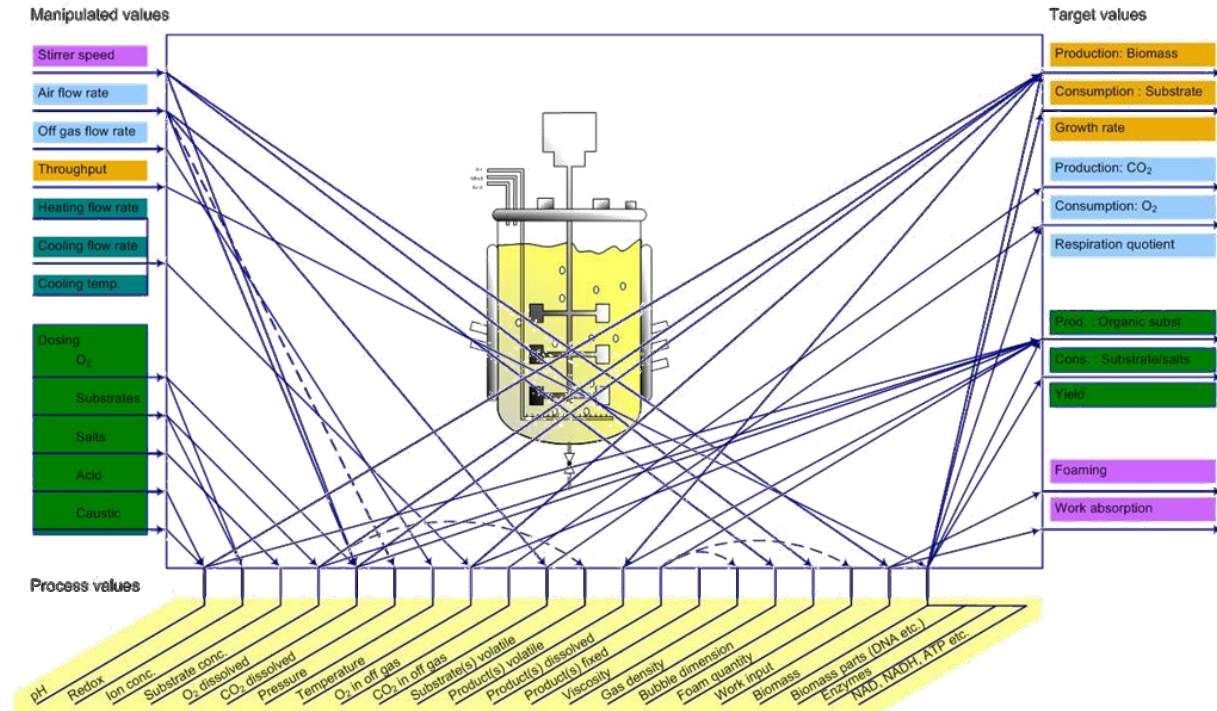
- Very strong validation requirements
→ **Stability even lack of flexibility**
- Today, subject to high economic pressures
→ **Improve industrial performance**

✓ **Paper** is the major challenge for better performance

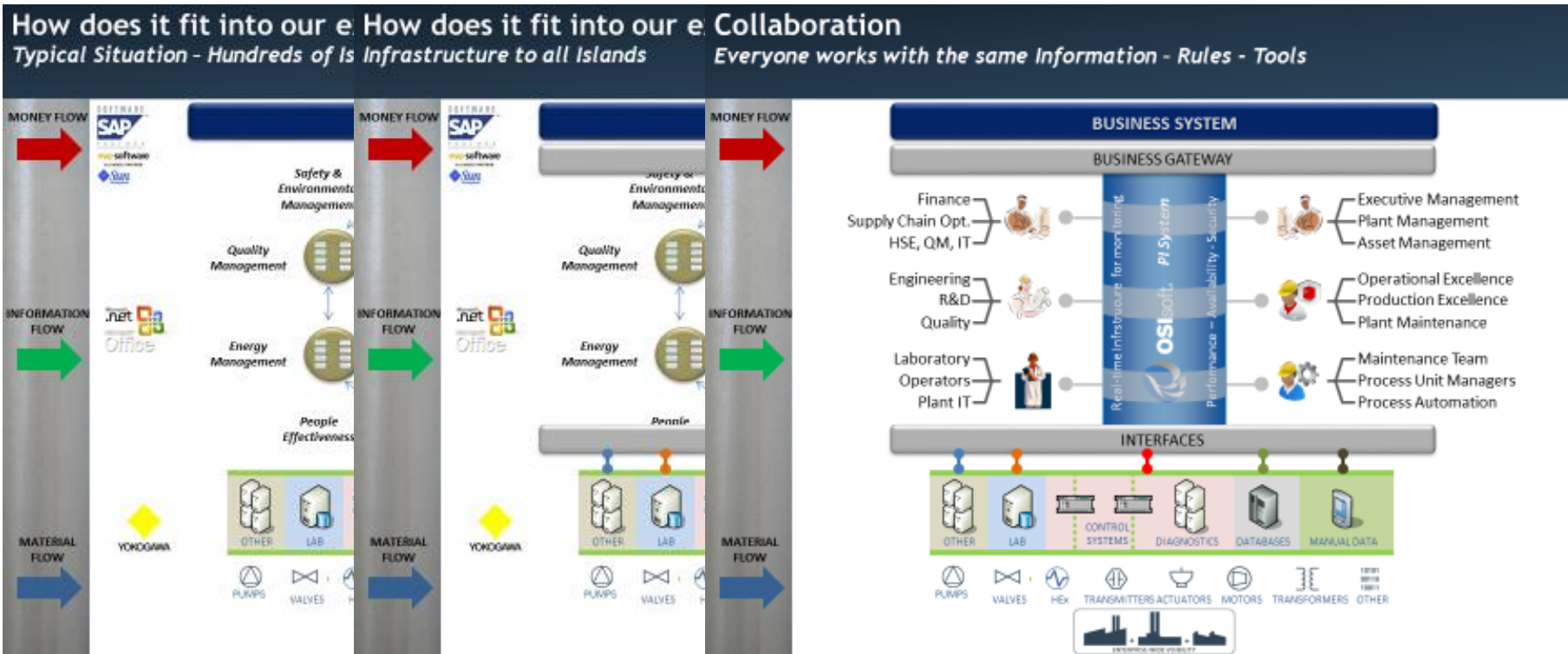


Challenges - DATA

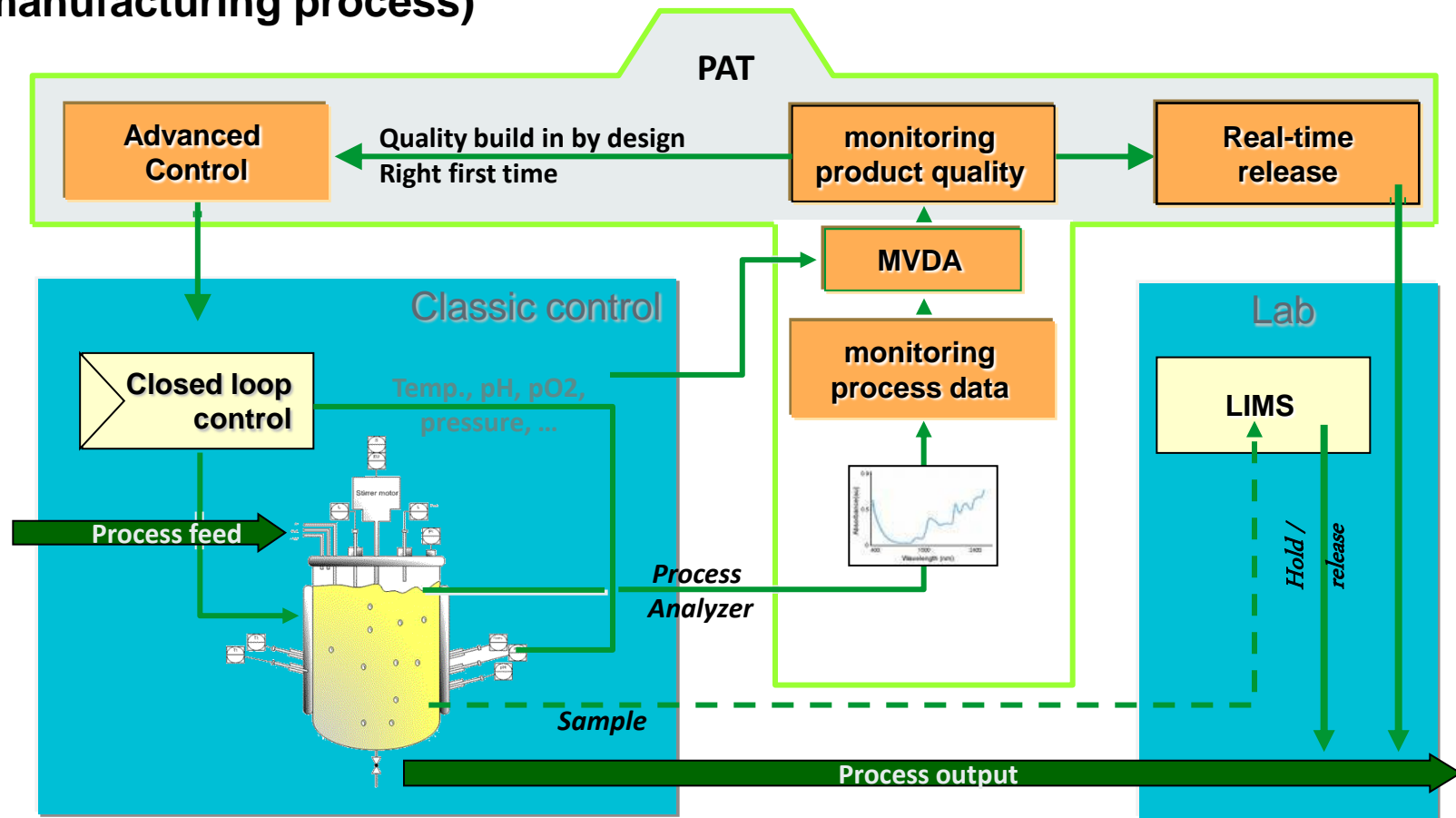
- The fermentation cycle takes a few weeks, we have to make a judgment according to the process values with a goal of ensuring final product quality.
- DATA – > It's better to have it and not need it, than need it and not have it.



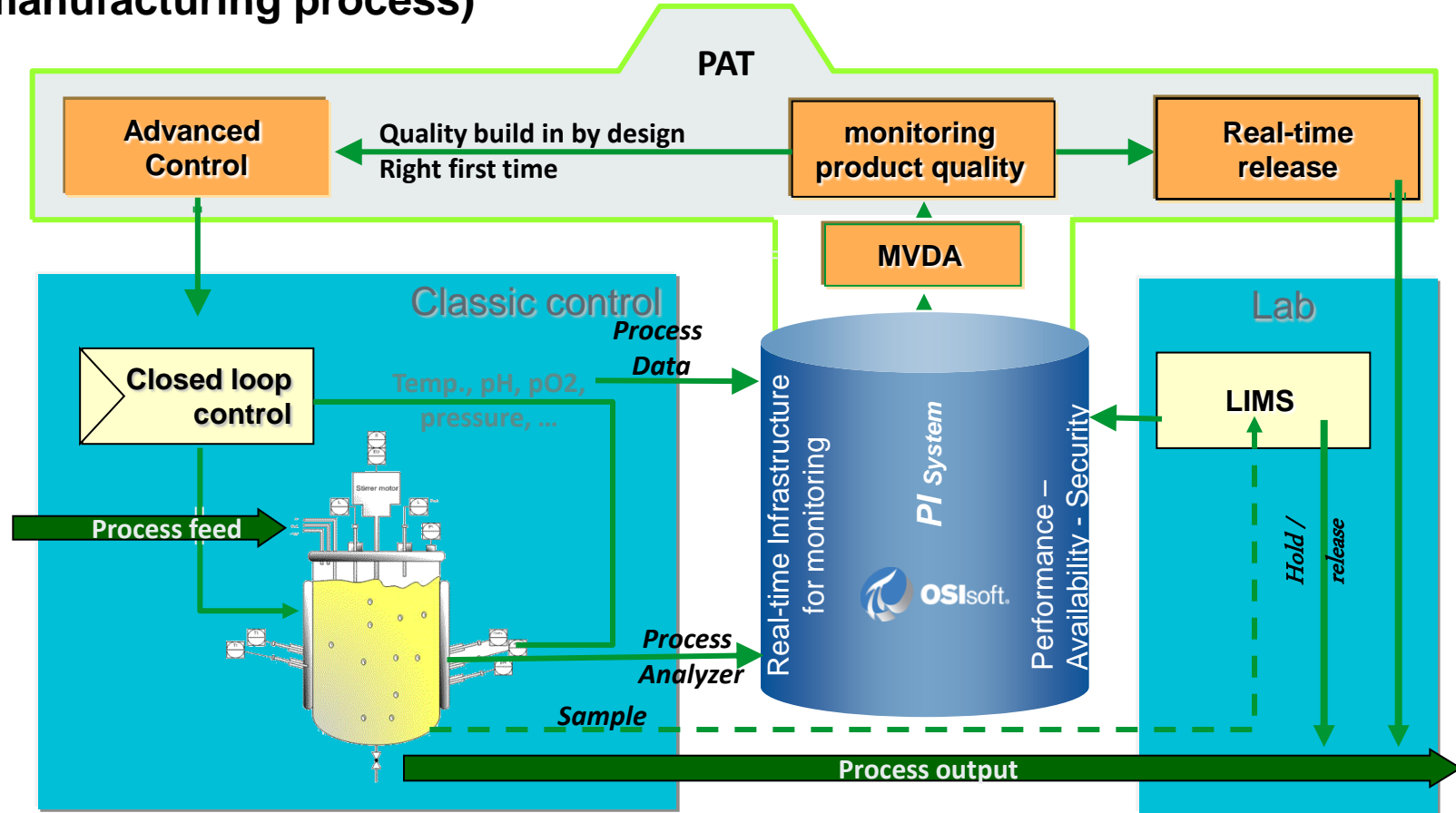
Meeting the PI System



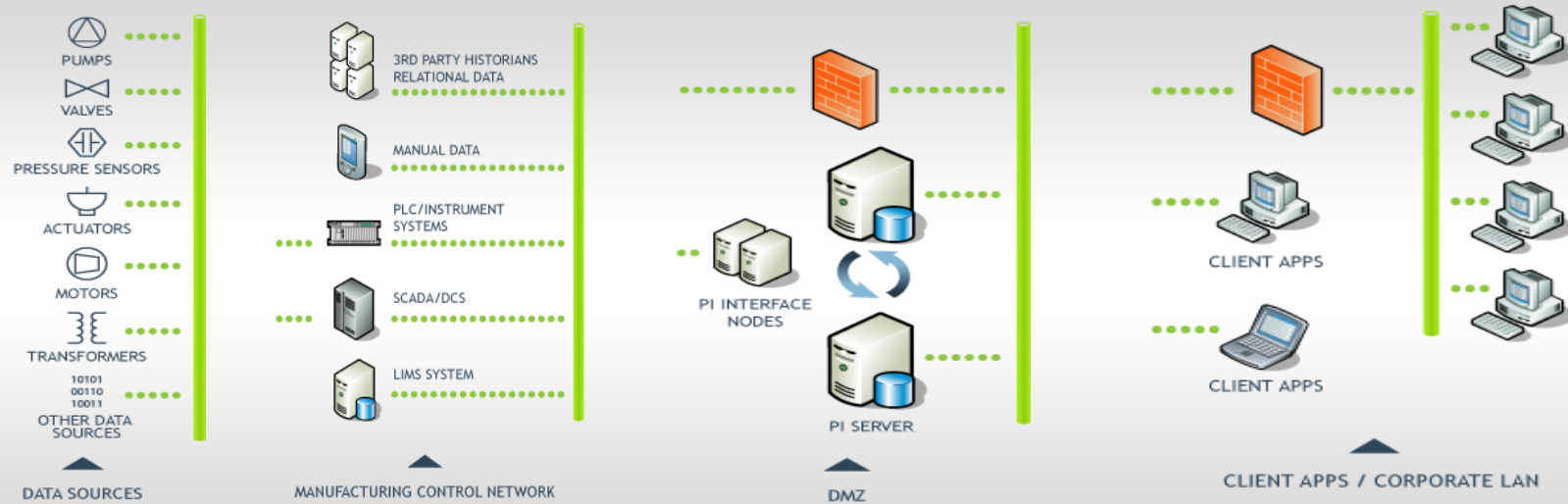
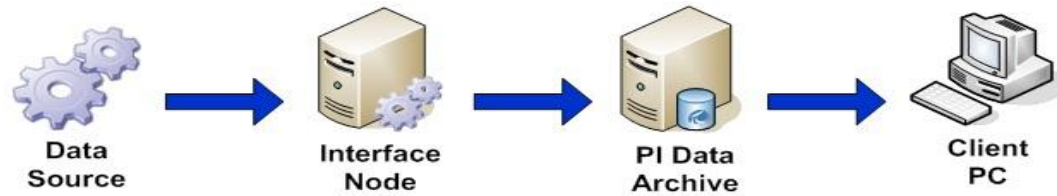
Application: PI System and PAT(= Understanding + controlling the manufacturing process)



Application: PI System and PAT(= Understanding + controlling the manufacturing process)

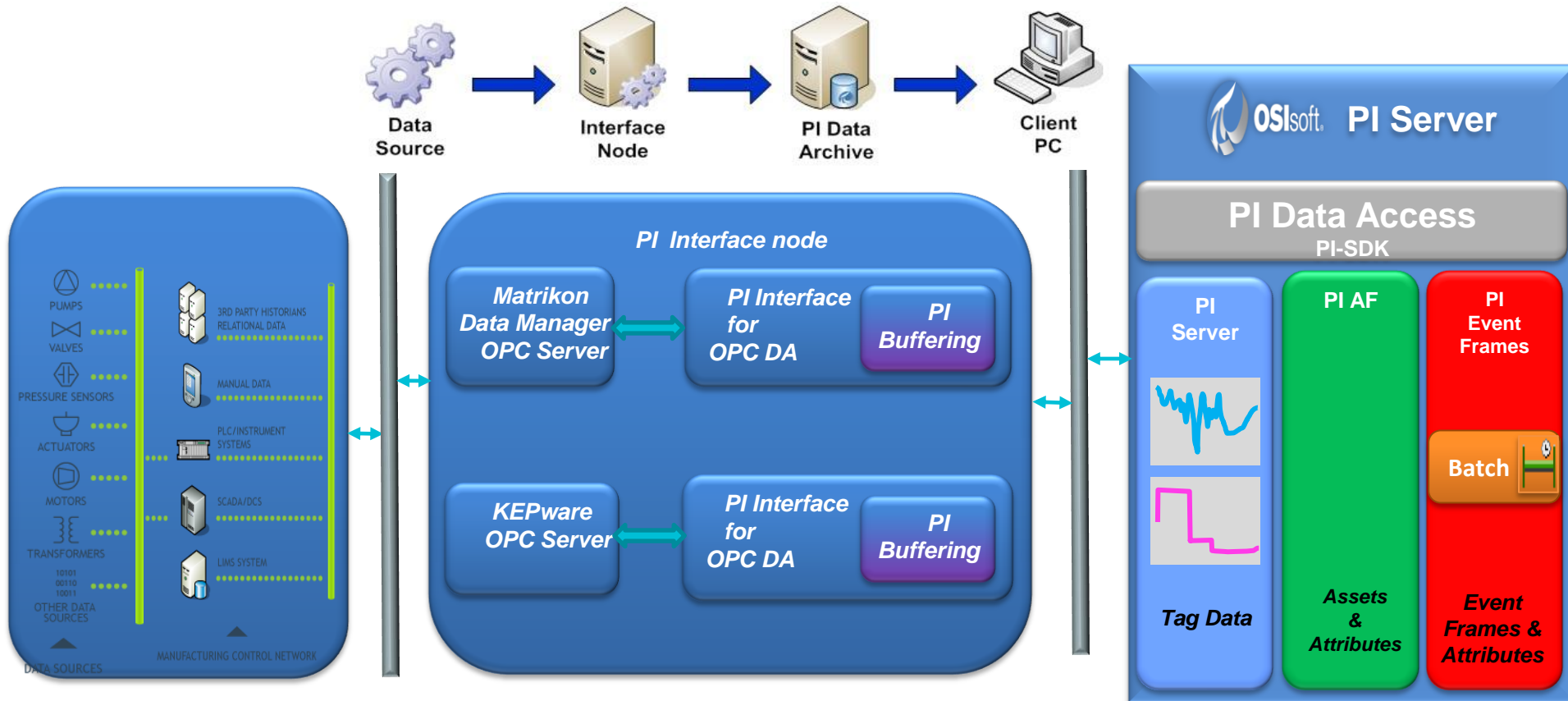


PI System Architecture



PI System Architecture

- 2000 tags
- PI Interface for OPC DA (2 pcs)
- PI Batch Generator (PIBaGen)



The PI System in Virtual Environment

DEBAPITSM - vSphere Client

File Edit View Inventory Administration Plug-ins Help

Home Inventory VMs and Templates

DEBAPITSM

TEVA-27

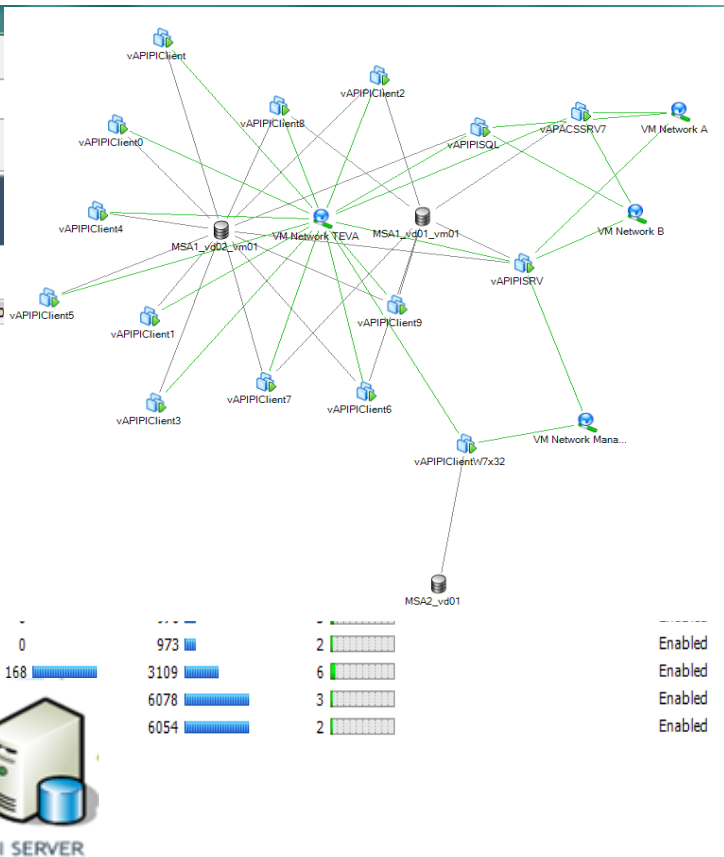
PI

Getting Started Virtual Machines Tasks & Events Alarms Permissions Maps Update Manager

PI INTERFACE NODES

	State	Status	Provisioned Space	Used Space	HO
PI Client					
vAPIPIClient	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient0	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient1	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient2	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient3	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient4	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient5	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient6	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient7	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient8	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient9	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClientW7x32	Powered On	✓ Normal	50.11 GB	50.11 GB	
vAPIPIClientW7x32	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient5	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient2	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient	Powered On	✓ Normal	26.14 GB	26.14 GB	
vAPIPIClient8	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPIPIClient0	Powered On	✓ Normal	25.09 GB	25.09 GB	
vAPACSSRV7	Powered On	✓ Normal	40.09 GB	40.09 GB	
vAPIPISRV	Powered On	✓ Normal	198.11 GB	198.11 GB	
vAPIPISQL	Powered On	✓ Normal	326.11 GB	326.11 GB	

PI SERVER



PI System Management Tools (PI SMT)

The screenshot displays the **Point Builder - PI System Management Tools (Administrator)** window. The left sidebar shows a tree view with categories like **Maintenance**, **Microsoft Office**, **Microsoft SQL Server**, **Microsoft Visual Studio**, and **PI System**. The **PI System** category is expanded, showing sub-items like **AboutPI-SDK**, **PI APS Configur**, **PI BatchView Qu**, **PI Collective Ma**, **PI Desktop Alert**, **PI Interface Cor**, **PI MDB to AF Pr**, **PI SQL Comman**, **PI System Explo**, **PI System Explo**, **PI System Mana**, **PI System Tray**, **PI-ACE Manager**, **PIPerfCreator.e**, **PISDKUtility (64**, and **PISDKUtility**. The **PI System Management Tools** section is highlighted. The central pane shows a list of servers under the **Server** column and their corresponding **Point** names. The right pane displays the **PI SMT User Guide** with a **Contents** list and a **PI System Management Tools** section.

PI System Management Tools

PI SMT consists of a container application, known as the host, and a library of plug-in tools designed for specific management tasks. Select a tool in the **System Management Tools** tree and the tool appears. In some cases the tool is disabled until you select one or more PI Servers.

Note: SMT tools are not standalone applications and cannot be placed in user-written programs, with the exception of the **Archive Editor** and **Module Database** tools, which are also available as part of **PI SDK** tools.

In This Section

- [Select a Server](#)
- [View the Session Record](#)
- [See How You Are Connected](#)
- [Set the Time Format](#)

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PI SMT - Point Configuration and the Excel Add-Ins

The image displays the PI SMT (Point System Management Tools) Administrator interface and the Excel Add-Ins. The top section shows the PI SMT Administrator window with the 'Collectives and Servers' pane on the left, listing servers like APIISRV. The main pane shows the 'PI-SMT' configuration. The bottom section shows the Excel Add-Ins ribbon, which includes tabs for 'PI DataLink' and 'PI Builder'. The 'PI Builder' tab is active, showing options for 'Show Values in Rows', 'Show Values in Columns', and 'Attribute Data References'. The 'PI DataLink' tab is also visible, showing options for 'PI Points', 'Library Elements', 'Event Frames', and 'Refresh'. The Excel spreadsheet below shows a table with columns for 'Server', 'Point', 'Point Source', 'Point Type', and 'Point Class'. The table contains data for various points, including APIISRV, CPR2401.PV, FC2401.PV, and FC2401C.PV. A red circle highlights the 'Point Source' column, and a red arrow points to the 'Import Tags...' button in the PI SMT Administrator window.

Server	Point	Point Source	Point Type	Point Class
APIISRV	CPR2401.PV	OPC1	Float32	classic
APIISRV	FC2401.PV	OPC1	Float32	classic
APIISRV	FC2401C.PV	OPC1	Float32	classic
APIISRV	FC2401C.SUM	OPC1	Float32	classic
APIISRV	FC2401C.AVG	OPC1	Float32	classic
APIISRV	FC2401C.MIN	OPC1	Float32	classic
APIISRV	FC2401C.MAX	OPC1	Float32	classic
APIISRV	FC2401C.DIFF	OPC1	Float32	classic
APIISRV	FC2401C.RATE	OPC1	Float32	classic
APIISRV	FC2401C.TOTAL	OPC1	Float32	classic
APIISRV	FC2401C.ACCUM	OPC1	Float32	classic
APIISRV	FC2401C.COUNT	OPC1	Float32	classic
APIISRV	FC2401C.AVERAGE	OPC1	Float32	classic
APIISRV	FC2401C.STANDARD	OPC1	Float32	classic
APIISRV	FC2401C.VARIANCE	OPC1	Float32	classic
APIISRV	FC2401C.COVARIANCE	OPC1	Float32	classic
APIISRV	FC2401C.CORRELATION	OPC1	Float32	classic
APIISRV	FC2401C.SKEWNESS	OPC1	Float32	classic
APIISRV	FC2401C.KURTOSIS	OPC1	Float32	classic
APIISRV	FC2401C.JENKINS	OPC1	Float32	classic
APIISRV	FC2401C.LJL	OPC1	Float32	classic
APIISRV	FC2401C.LJL2	OPC1	Float32	classic
APIISRV	FC2401C.LJL3	OPC1	Float32	classic
APIISRV	FC2401C.LJL4	OPC1	Float32	classic
APIISRV	FC2401C.LJL5	OPC1	Float32	classic
APIISRV	FC2401C.LJL6	OPC1	Float32	classic
APIISRV	FC2401C.LJL7	OPC1	Float32	classic
APIISRV	FC2401C.LJL8	OPC1	Float32	classic
APIISRV	FC2401C.LJL9	OPC1	Float32	classic
APIISRV	FC2401C.LJL10	OPC1	Float32	classic
APIISRV	FC2401C.LJL11	OPC1	Float32	classic
APIISRV	FC2401C.LJL12	OPC1	Float32	classic
APIISRV	FC2401C.LJL13	OPC1	Float32	classic
APIISRV	FC2401C.LJL14	OPC1	Float32	classic
APIISRV	FC2401C.LJL15	OPC1	Float32	classic
APIISRV	FC2401C.LJL16	OPC1	Float32	classic
APIISRV	FC2401C.LJL17	OPC1	Float32	classic
APIISRV	FC2401C.LJL18	OPC1	Float32	classic
APIISRV	FC2401C.LJL19	OPC1	Float32	classic
APIISRV	FC2401C.LJL20	OPC1	Float32	classic
APIISRV	FC2401C.LJL21	OPC1	Float32	classic
APIISRV	FC2401C.LJL22	OPC1	Float32	classic
APIISRV	FC2401C.LJL23	OPC1	Float32	classic
APIISRV	FC2401C.LJL24	OPC1	Float32	classic
APIISRV	FC2401C.LJL25	OPC1	Float32	classic
APIISRV	FC2401C.LJL26	OPC1	Float32	classic
APIISRV	FC2401C.LJL27	OPC1	Float32	classic
APIISRV	FC2401C.LJL28	OPC1	Float32	classic
APIISRV	FC2401C.LJL29	OPC1	Float32	classic
APIISRV	FC2401C.LJL30	OPC1	Float32	classic
APIISRV	FC2401C.LJL31	OPC1	Float32	classic
APIISRV	FC2401C.LJL32	OPC1	Float32	classic
APIISRV	FC2401C.LJL33	OPC1	Float32	classic
APIISRV	FC2401C.LJL34	OPC1	Float32	classic
APIISRV	FC2401C.LJL35	OPC1	Float32	classic
APIISRV	FC2401C.LJL36	OPC1	Float32	classic
APIISRV	FC2401C.LJL37	OPC1	Float32	classic
APIISRV	FC2401C.LJL38	OPC1	Float32	classic
APIISRV	FC2401C.LJL39	OPC1	Float32	classic
APIISRV	FC2401C.LJL40	OPC1	Float32	classic
APIISRV	FC2401C.LJL41	OPC1	Float32	classic
APIISRV	FC2401C.LJL42	OPC1	Float32	classic
APIISRV	FC2401C.LJL43	OPC1	Float32	classic
APIISRV	FC2401C.LJL44	OPC1	Float32	classic
APIISRV	FC2401C.LJL45	OPC1	Float32	classic
APIISRV	FC2401C.LJL46	OPC1	Float32	classic
APIISRV	FC2401C.LJL47	OPC1	Float32	classic
APIISRV	FC2401C.LJL48	OPC1	Float32	classic
APIISRV	FC2401C.LJL49	OPC1	Float32	classic
APIISRV	FC2401C.LJL50	OPC1	Float32	classic
APIISRV	FC2401C.LJL51	OPC1	Float32	classic
APIISRV	FC2401C.LJL52	OPC1	Float32	classic
APIISRV	FC2401C.LJL53	OPC1	Float32	classic
APIISRV	FC2401C.LJL54	OPC1	Float32	classic
APIISRV	FC2401C.LJL55	OPC1	Float32	classic
APIISRV	FC2401C.LJL56	OPC1	Float32	classic
APIISRV	FC2401C.LJL57	OPC1	Float32	classic
APIISRV	FC2401C.LJL58	OPC1	Float32	classic
APIISRV	FC2401C.LJL59	OPC1	Float32	classic
APIISRV	FC2401C.LJL60	OPC1	Float32	classic
APIISRV	FC2401C.LJL61	OPC1	Float32	classic
APIISRV	FC2401C.LJL62	OPC1	Float32	classic
APIISRV	FC2401C.LJL63	OPC1	Float32	classic
APIISRV	FC2401C.LJL64	OPC1	Float32	classic
APIISRV	FC2401C.LJL65	OPC1	Float32	classic
APIISRV	FC2401C.LJL66	OPC1	Float32	classic
APIISRV	FC2401C.LJL67	OPC1	Float32	classic
APIISRV	FC2401C.LJL68	OPC1	Float32	classic
APIISRV	FC2401C.LJL69	OPC1	Float32	classic
APIISRV	FC2401C.LJL70	OPC1	Float32	classic
APIISRV	FC2401C.LJL71	OPC1	Float32	classic
APIISRV	FC2401C.LJL72	OPC1	Float32	classic
APIISRV	FC2401C.LJL73	OPC1	Float32	classic
APIISRV	FC2401C.LJL74	OPC1	Float32	classic
APIISRV	FC2401C.LJL75	OPC1	Float32	classic
APIISRV	FC2401C.LJL76	OPC1	Float32	classic
APIISRV	FC2401C.LJL77	OPC1	Float32	classic
APIISRV	FC2401C.LJL78	OPC1	Float32	classic
APIISRV	FC2401C.LJL79	OPC1	Float32	classic
APIISRV	FC2401C.LJL80	OPC1	Float32	classic
APIISRV	FC2401C.LJL81	OPC1	Float32	classic
APIISRV	FC2401C.LJL82	OPC1	Float32	classic
APIISRV	FC2401C.LJL83	OPC1	Float32	classic
APIISRV	FC2401C.LJL84	OPC1	Float32	classic
APIISRV	FC2401C.LJL85	OPC1	Float32	classic
APIISRV	FC2401C.LJL86	OPC1	Float32	classic
APIISRV	FC2401C.LJL87	OPC1	Float32	classic
APIISRV	FC2401C.LJL88	OPC1	Float32	classic
APIISRV	FC2401C.LJL89	OPC1	Float32	classic
APIISRV	FC2401C.LJL90	OPC1	Float32	classic
APIISRV	FC2401C.LJL91	OPC1	Float32	classic
APIISRV	FC2401C.LJL92	OPC1	Float32	classic
APIISRV	FC2401C.LJL93	OPC1	Float32	classic
APIISRV	FC2401C.LJL94	OPC1	Float32	classic
APIISRV	FC2401C.LJL95	OPC1	Float32	classic
APIISRV	FC2401C.LJL96	OPC1	Float32	classic
APIISRV	FC2401C.LJL97	OPC1	Float32	classic
APIISRV	FC2401C.LJL98	OPC1	Float32	classic
APIISRV	FC2401C.LJL99	OPC1	Float32	classic
APIISRV	FC2401C.LJL100	OPC1	Float32	classic

PI Batch Generator example

The screenshot displays the PI System Management Tools (Administrator) interface, specifically the Batch Generator configuration for a bioreactor process. The interface is divided into several sections:

- Left Panel (Collectives and Servers):**
 - Servers:** A tree view showing the hierarchy of the system. The 'APIISRV' server is selected, and its 'Modules' are listed, including '%DSI', '%DSI_MCN', 'API', 'DEB', and 'SBB'. The 'UNF2401' module is expanded, showing its 'Aliases' and 'Process values'.
 - System Management Tools:** A list of tools including Alarms, Batch, Data, Interfaces, IT Points, and Operation. The 'Batch' tool is selected, and its sub-items are listed, including 'Batch Custom Names', 'Batch Database', 'Batch Generator', and 'Module Database'.
- Central Panel (Batch Generator Configuration):**
 - Manipulated values:** A list of process variables that can be controlled, including Stirrer speed, Air flow rate, Off gas flow rate, Throughput, Heating flow rate, Cooling flow rate, Cooling temp, Dissolving O₂, Substrate, Salt, Acid, and Cautic.
 - Target values:** A list of process variables that are targets for the batch, including Production: Biomass, Consumption: Substrate, Growth rate, Production: CO₂, Consumption: O₂, Respiration quotient, pH, Substrate, Salt, Acid, Cautic, Foaming, and Work absorption.
 - Process values:** A list of process variables that are monitored, including pH, Redox, Ion conc., Substrate conc., O₂ dissolved, CO₂ dissolved, Pressure, Temperature, O₂ in off gas, CO₂ in off gas, Substrate(s) volatile, Product(s) volatile, Product(s) dissolved, Viscosity, Gas density, Bubble dimension, Foam quantity, Work input, Biomass, Biomass parts (DNA etc.), Enzymes, and MIO, TAOH, ATP etc.
- Right Panel (Session Record):** A section for recording and reviewing the batch process.

PI Batch Generator example

The image displays two screenshots of the OSIsoft PI Batch Generator software interface, illustrating a batch process for fermentation.

Left Screenshot (UNF2401 SFC):

- Window Title:** UNF2401 SFC
- Mode:** MODE: AUT, ALARM: NR, BSTS: RUNNING
- Batch Generator:** A sidebar on the left lists various data sources and interfaces. The 'Batch Generator' section is expanded, showing a list of steps: 1 Start, 2 Fermentation, and 3 End. A red box highlights the 'Start' step.
- Process Flow:** A central diagram shows a fermentation vessel with various inputs and outputs. A red arrow points from the 'Start' step in the 'Batch Generator' list to the 'Fermentales' step in the 'UPR2401 SFC' window.

Right Screenshot (UPR2401 SFC):

- Window Title:** UPR2401 SFC
- Mode:** MODE: AUT, ALARM: NR, BSTS: RUNNING
- Process Flow:** A detailed flowchart showing the sequence of operations (OP01 to OP16) for the fermentation process. A red box highlights the 'Fermentales' step (OP11) in the flowchart, and a red arrow points from it to the 'Fermentales' step in the 'Batch Generator' list.

PI Batch Generator example

UNF2401 SFC

MODE: **AUT** ALRM: **NR** BSTS: **RUNNING**

DIALOGUE:

1 Start

CHECK

2 Fermentation

3 End

OP04 Ureagor.sterilize

OP05

OP06

OP07

OP08 Fermentas

OP09

OP10

OP11

OP12

OP05 Tpt.fogadas

OP06 Tpt.sterilize

OP07 Oltas

OP08

OP09 Hidrolisis

OP10 Resleengedes

OP11 Mosas

OP12 Emergency

Next

Ready

Configuration for

PIUnitBatches PISubBatches PIBatches **Interface**

Active Point UNF2401.RUNS

ActivePoint Behavior

☒ Pulse

☐ Step

☐ Include zeroth state (Continuous)

Strings indicating zeroth state (example: Inactive,Stop,Off)

END

Unit Batch ID Point UNF2401.BATCH_ID

Product Name Point UNF2401.PROD_ID

Procedure Name Point UNF2401.SPHASE

Evaluation Delay 5 seconds ☐ Evaluate at the end of each UnitBatch

Recovery Options

☐ Do not recover anything

☒ Recover all PI Batch Objects

☐ Recover only PIBatches and PIUnitBatches

Recovery time (in days) 4

Merge Consecutive

☒ Off

☐ On

PIUnit Debug messages

☒ Off

☐ On

PI BatchView with PI ProcessBook

PI ProcessBook - [Display1*]

File Edit View Insert Tools Draw Arrange Window Help

Batch Definition

Main Layout Settings

Search Parameters

Find: All PIUnitBatches APIISRV

Include: ☐ Running ☐ Completed ☒ Both

Batch ID *

Product *

Unit Name UNF240*

Time Range and Duration

Active Between: *-1 day and *

Any Length and

Search

Clear

Advanced Search

Edit...

Batch ID	Start Time	End Time	Product	Unit Name	Proc
70120201114	5/17/2014 3:00:...	Still Running	701	UNF2406	
70120201014	5/14/2014 1:41:...	Still Running	701	UNF2404	
70120200914	5/12/2014 1:53:...	Still Running	701	UNF2403	
70120200814	5/10/2014 3:59:...	Still Running	701	UNF2402	
70120200714	5/7/2014 8:08:3	Still Running	701	UNF2401	

Available Aliases:

☒ Common ☐ All

Mixing

O2

OUR

PO2

PROD_ID

Add Alias ->

Tag Search...

Custom Placeholders

Tags/Aliases

AirFlow

pH

OK Cancel Help

Ready

Server Time

NUM

The screenshot displays the PI ProcessBook (Display1*) interface, which is used for monitoring and controlling industrial processes. The main window is divided into two primary sections: a Batch Gantt chart at the top and a Batch Trend chart at the bottom.

Batch Gantt Chart: This chart shows a timeline of batch processes from day 1 to 13. The processes are represented by horizontal bars. Green bars indicate successful runs, while red bars indicate failed runs. The processes are labeled with IDs such as 70120, 70120201014, 70120200914, 70120200814, 70120200714, 70120200614, 70120200514, 70120200414, 70120200314, 70120200214, and 70120200114. A blue arrow points from the Batch Trend chart to the Batch Gantt chart, highlighting a specific process.

Batch Trend Chart: This chart displays various process parameters over time. The parameters are listed in a legend on the right, including AirFlow, NMS/R, pH, and others. The chart shows the trends of these parameters over the 13-day period. A blue arrow points from the Batch Trend chart to the Batch Gantt chart, highlighting a specific process.

The interface includes a menu bar at the top with options like File, Edit, View, Insert, Tools, Draw, Arrange, Window, and Help. A toolbar below the menu bar contains various icons for file operations, editing, and viewing. The status bar at the bottom shows the current date and time (5/17/2011 11:06 PM) and the server time.

PI DataLink – Excel application example (simple reporting)

pi_MultiChart2 - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Add-Ins **PI DataLink** PI Builder

Current Archive Value Value Single Value Compressed Data Multiple Value Sampled Data Timed Data Calculated Data Calculation Time Filtered Events Explore Compare Search Asset Filter Properties Update Settings About Help Resources Insert Trend Point ID to Tag Attribute Mask to Tag Tag Functions Module Browse Alias to Tag Property to Value Module Database

C1 {=PIBVSearch(2,"APIPISRV","", "", "2", "", "*-365 day", "", "", "B.0,S.0,E.0,P.0,U.0,C.0,V.0",392,PIBVUnitBatchSearchMasks(Batch!\$B\$1,"","", "", ""))}

BATCH_ID	70310302014	PIUnitBatch Count	1
	Batch ID	Start Time	End
	70310302014	16-Jul-14 18:29:46	
NOW	2014.09.02 08:14		
Temperature on batch	Airflow on batch 70310302014	Pressure on batch 70310302014	Mixing on batch 70310302014
Param 1	Param 2	Param 3	Param 4
Temperature	Airflow	Pressure	Mixing
22	3000	0.3	40
24	5000	0.5	140

Unit Procedure PI Server
APIDEBUUNF9502 Growth APIPISRV

Param 6	Param 7	Param 8	Param 9
pH	PO2	Power	CPR
6	5	3	
5.6	95	35	

Batch Data_source Param_1 Param_2 Param_3 Param_4 Param_5 Param_6 Param_7 Param_8 Param_9 Param_10

PI DataLink – Excel application example (simple reporting)

The screenshot displays the PI DataLink Excel application interface. The main window shows a data table with columns for time, various process variables (PV), and parameters (P). The formula bar at the top displays the formula: `{=PISampDat(Data_source!B1,Batch!D3,Batch!E3,"1 h",1,,)}`. The right-hand side of the interface features two configuration panels: "Sampled Data" and "Alias to Tag".

Sampled Data Panel:

- ☒ Data item
- ☐ Expression
- Root path (optional):
- Data item(s): `'Data_source!B1'`
- Start time: `'Batch!D3'`
- End time: `'Batch!E3'`
- Time interval:

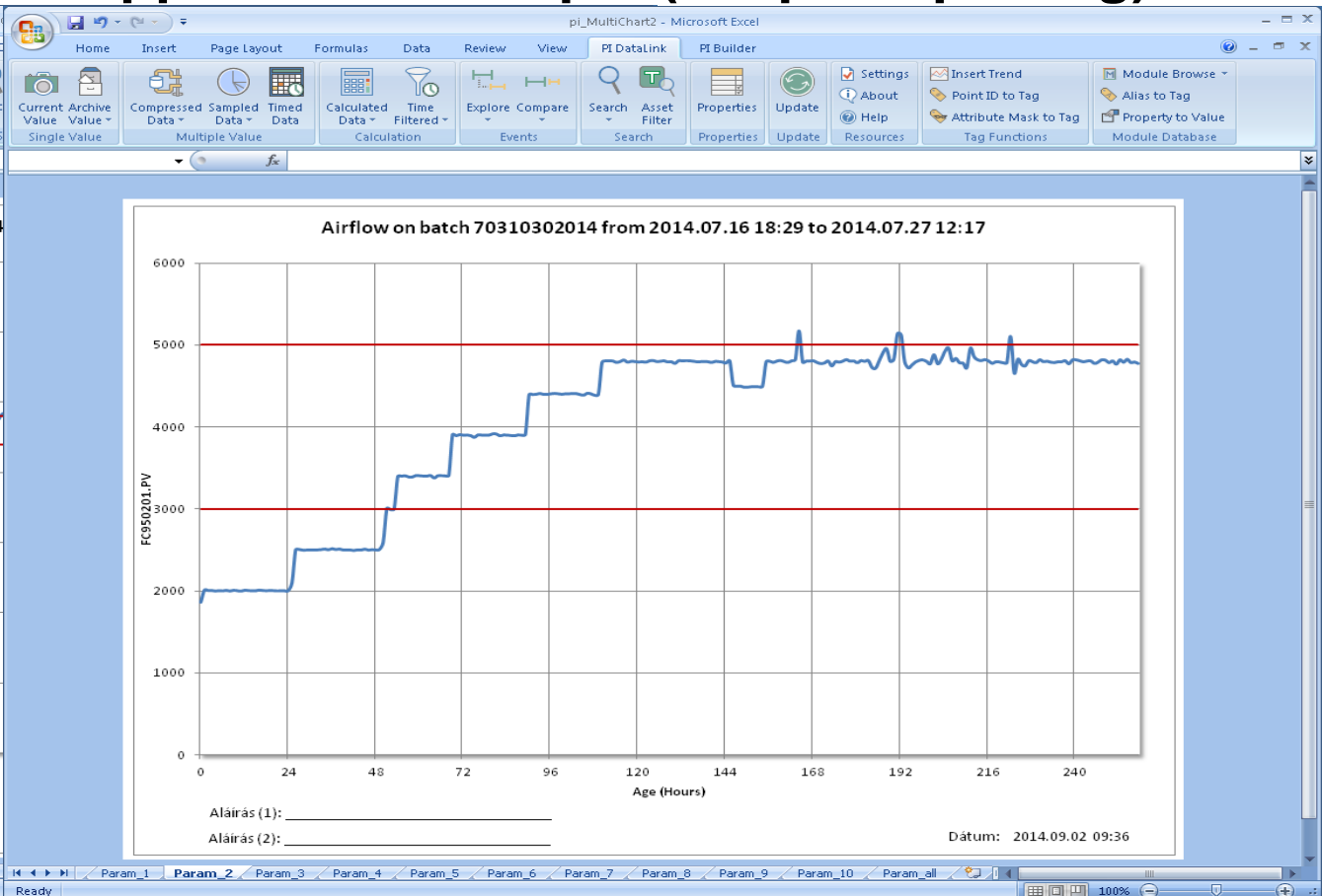
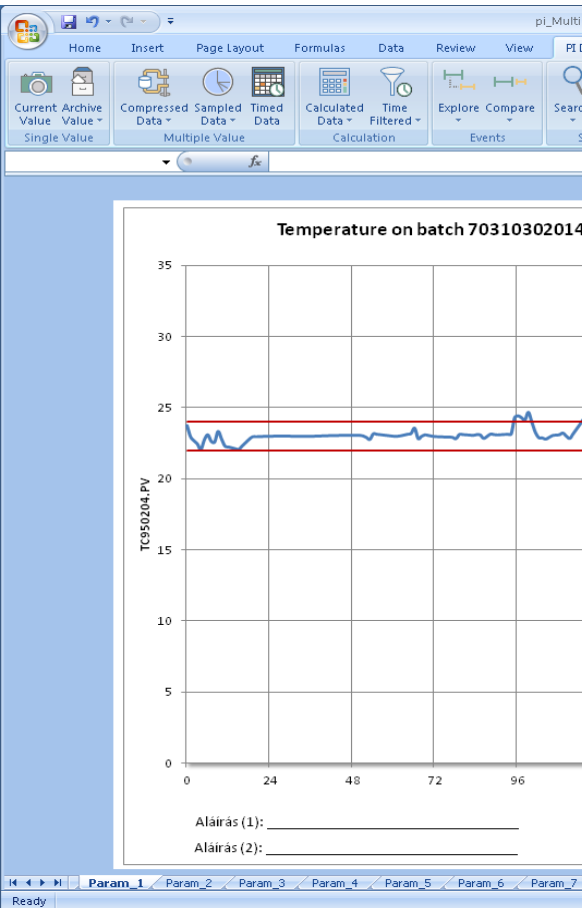
Alias to Tag Panel:

- PI Server (optional): `APIISRV`
- Alias(es): `'Batch!A7'`
- Module path: `'Batch!G3'`
- Query date: `'`
- Output cell: `'Data_source!B1'`
- ☒ No server
- ☐ Server at right

Data Table:

	A	B	C	D	E	F	G	H	I	J
1		TC950204.PV	P1_MIN	P1_MAX	FC950201.PV	P2_MIN	P2_MAX	PC950207.PV	P3_MIN	P3_MAX
2	16-Jul-14 18:29:46	23.74857822	22	24	1857.371948	3000	5000	0.317430139	0.3	0.5
3	16-Jul-14 19:29:46	22.9596138	22	24	2005.358154	3000	5000	0.297912538	0.3	0.5
4	16-Jul-14 20:29:46	22.67299843	22	24	2001.205566	3000	5000	0.278394908	0.3	0.5
5	16-Jul-14 21:29:46	22.44439507	22	24	2001.074219	3000	5000	0.258877307	0.3	0.5
6	16-Jul-14 22:29:46	22.05265427	22	24	1994.835327	3000	5000	0.239359707	0.3	0.5
7	16-Jul-14 23:29:46	22.72621918	22	24	1998.82959	3000	5000	0.219842091	0.3	0.5
8	17-Jul-14 00:29:46	23.09074211	22	24	1996.472046	3000	5000	0.200324476	0.3	0.5
9	17-Jul-14 01:29:46	22.63234329	22	24	2002.97644	3000	5000	0.200325191	0.3	0.5
10	17-Jul-14 02:29:46	22.57582092	22	24	1994.380981	3000	5000	0.200437516	0.3	0.5
11	17-Jul-14 03:29:46	23.32906914	22	24	2003.979736	3000	5000	0.200549841	0.3	0.5
12	17-Jul-14 04:29:46	22.7946682	22	24	1998.344727	3000	5000	0.200662166	0.3	0.5
13	17-Jul-14 05:29:46	22.29523849	22	24	1993.412109	3000	5000	0.200774491	0.3	0.5
14	17-Jul-14 06:29:46	22.23297691	22	24	2003.817383	3000	5000	0.200886816	0.3	0.5
15	17-Jul-14 07:29:46	22.17071724	22	24	2000.447632	3000	5000	0.200999141	0.3	0.5
16	17-Jul-14 08:29:46	22.10845566	22	24	1997.681152	3000	5000	0.20108597	0.3	0.5
17	17-Jul-14 09:29:46	22.07034302	22	24	1997.448975	3000	5000	0.200974017	0.3	0.5
18	17-Jul-14 10:29:46	22.30428505	22	24	2008.062134	3000	5000	0.200862065	0.3	0.5

PI DataLink – Excel application example (simple reporting)



Benefit

- Less paperwork
- Site-wide process visibility
- Batch tracking, investigations
- Users can get the data what they need

Future opportunities

- Batch Reporting based on RtReports
- More data source - PI Server extension
- More eyes on PI System – new clients
- MES integration
- Technology transfer from “Glass lab” to full scale manufacturing

Conclusion

Business Challenge

- Automate the manufacturing workflow
- Provide an easy tool for comparing and analyzing batches
- Provide a standard rapid and cost effective approach to capturing key process data

Solution

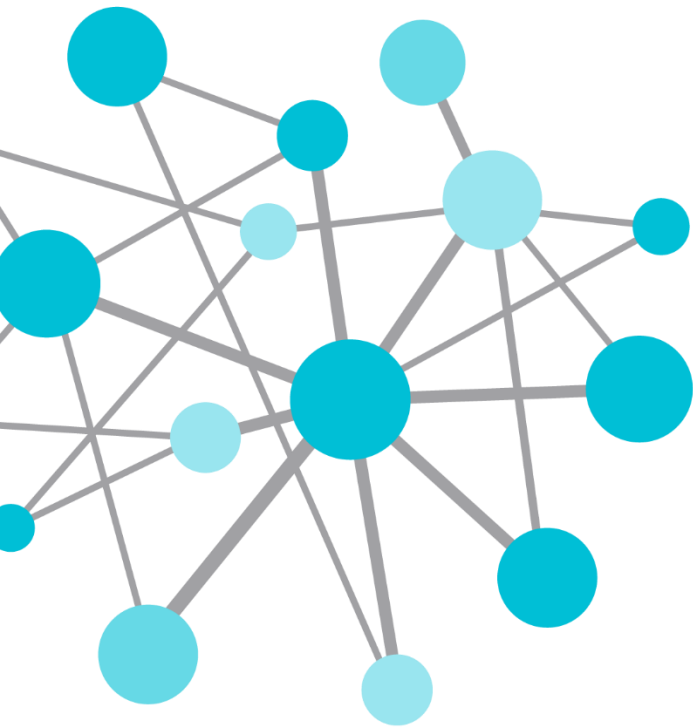
- PI System with Batch functionality

Results / Benefits

- Less paperwork
- More focus on process less time with data mining
- Optimized batch cycle time
- Better equipment utilization

László Simon

- Laszlo.simon@teva.hu
- Head of Automation
- TEVA Hungary

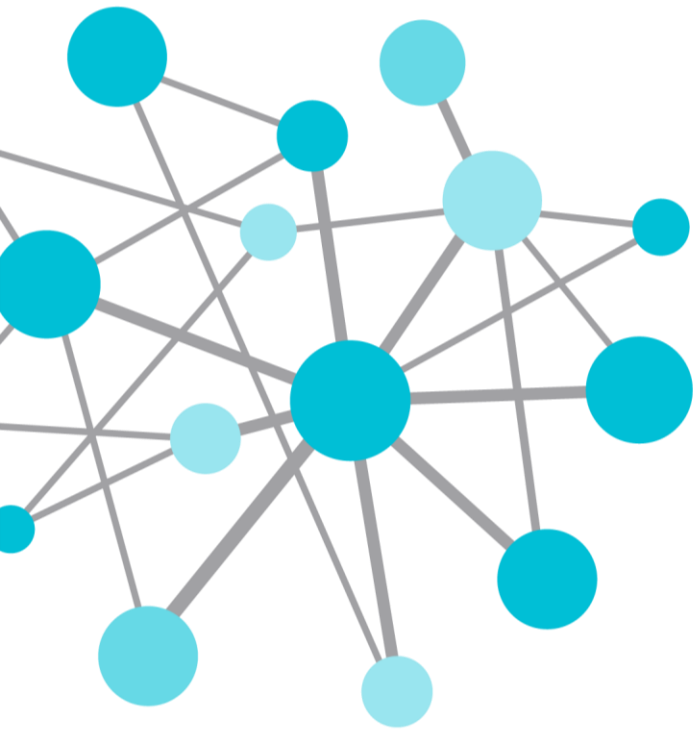


Questions

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the **microphone**
before asking
your questions



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**name &
company**



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