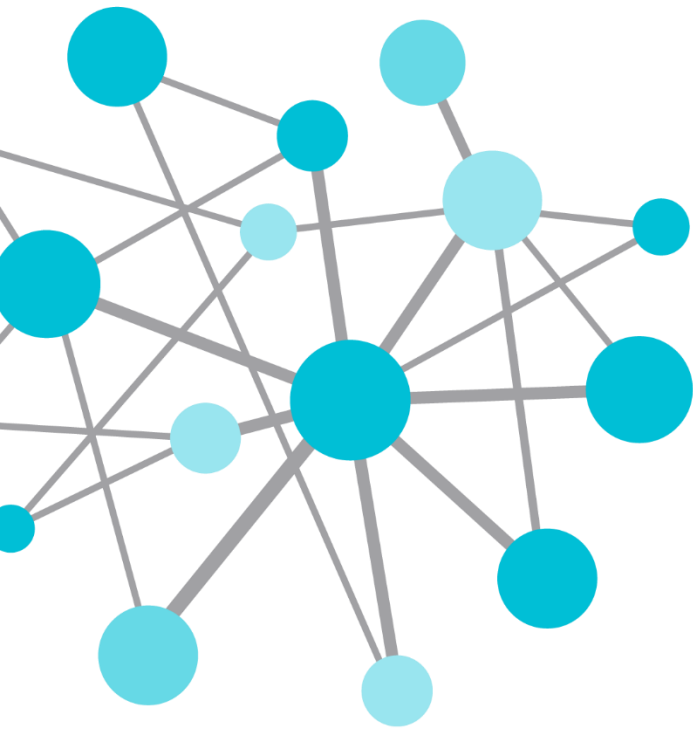
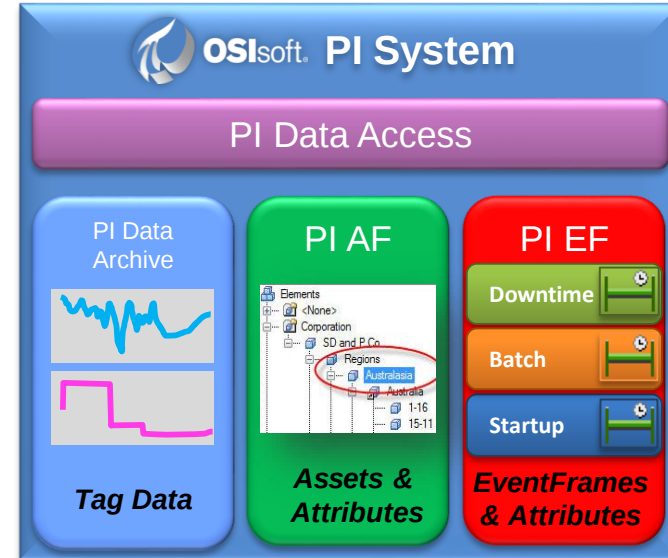
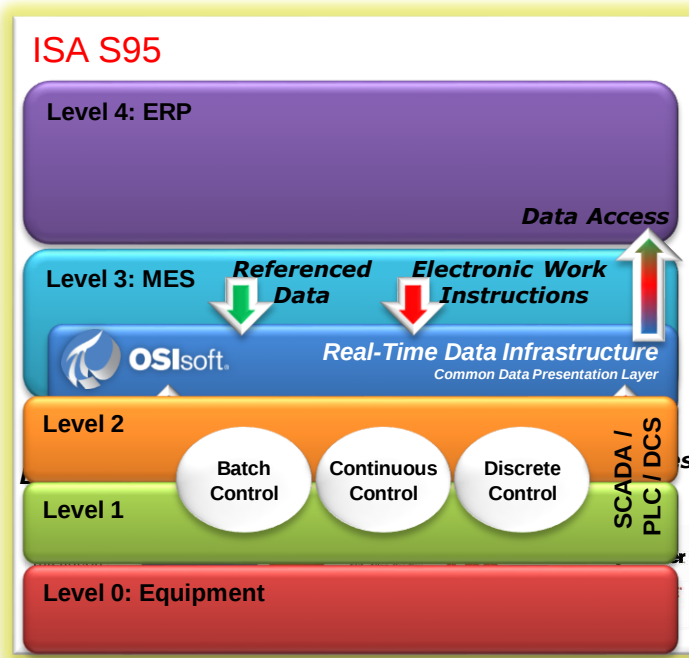




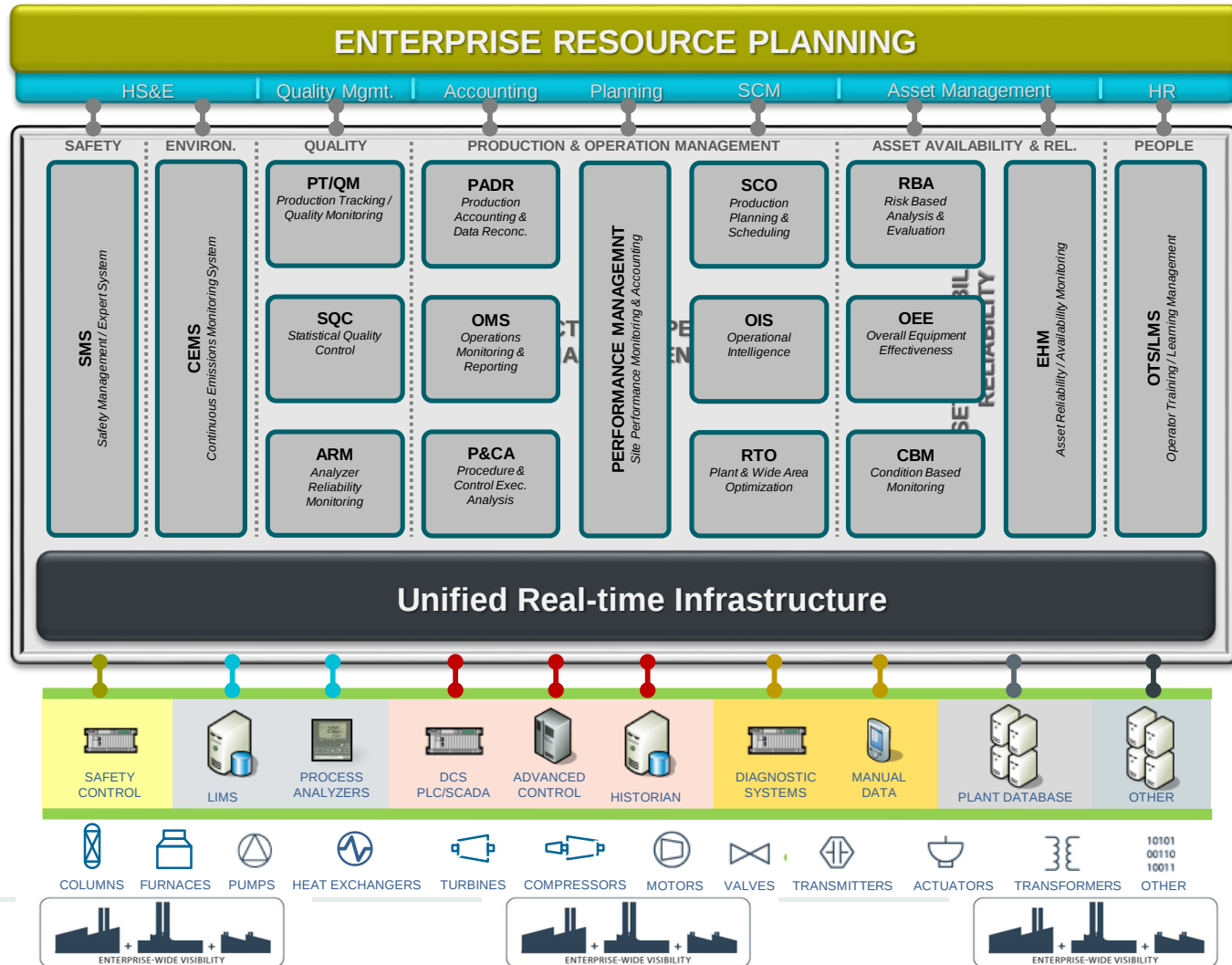
# Overview of The PI System

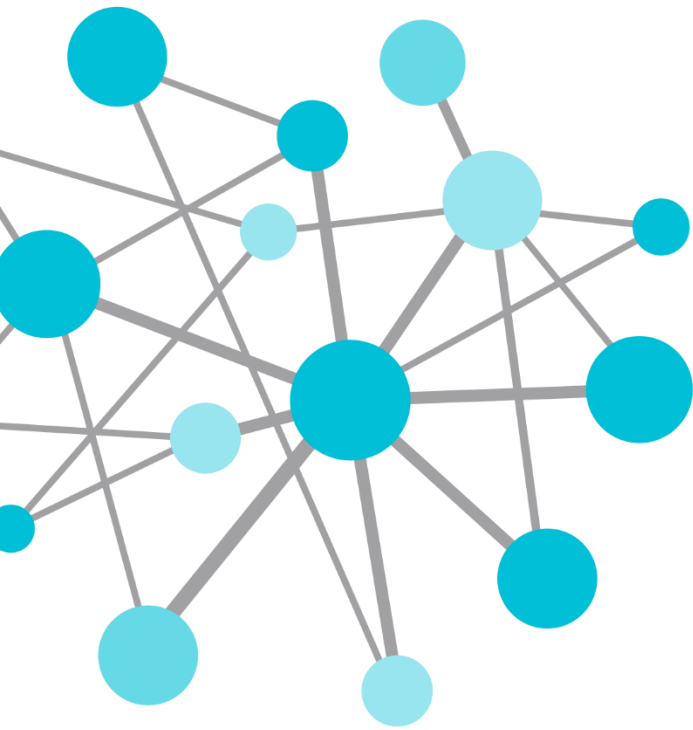
Presented by **Frank Batke**  
**Hans Otto Weinhold**

# Aggregation – PI System Data Infrastructure



# ENTERPRISE RESOURCE PLANNING





# From Tag to Asset

**30+ Years of experience**

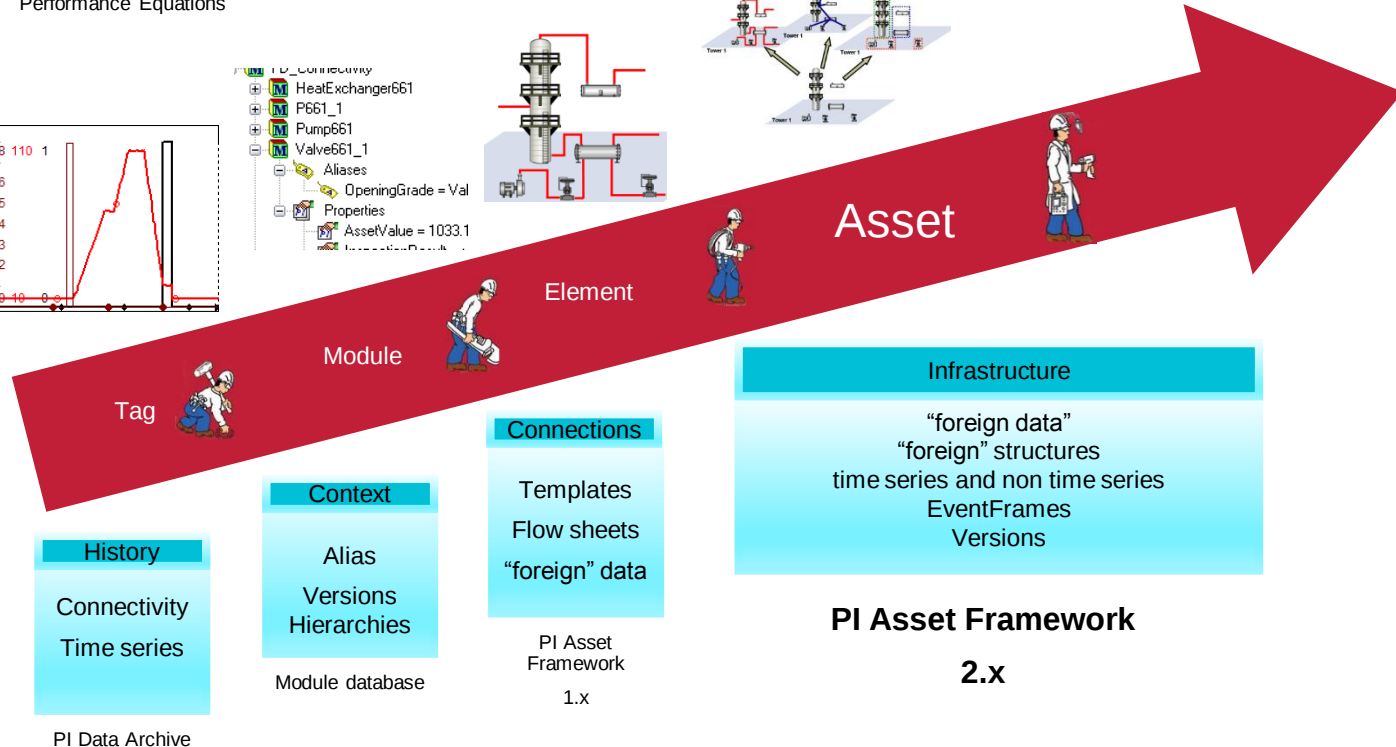
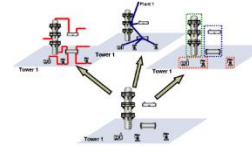
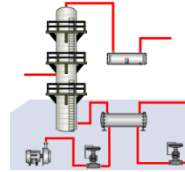
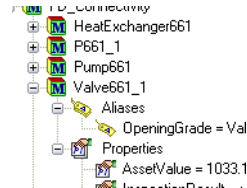
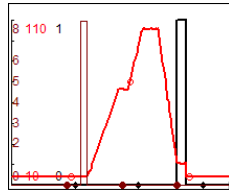


# Going Asset centric

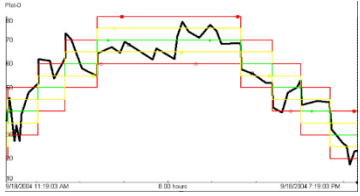
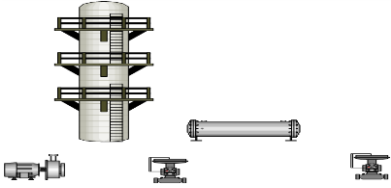
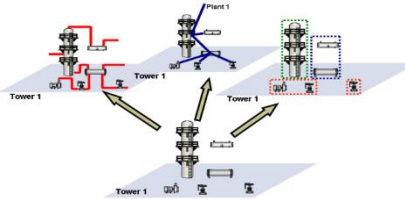
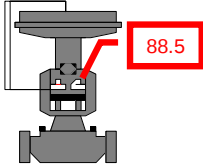
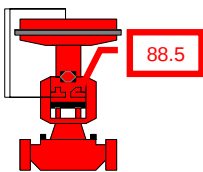
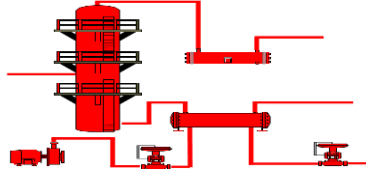
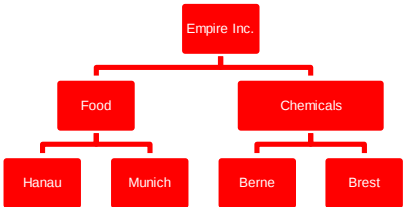
PI Processbook  
PI Datalink  
PI Batch  
Performance Equations

PI ACE  
RtReports  
Module relative Displays

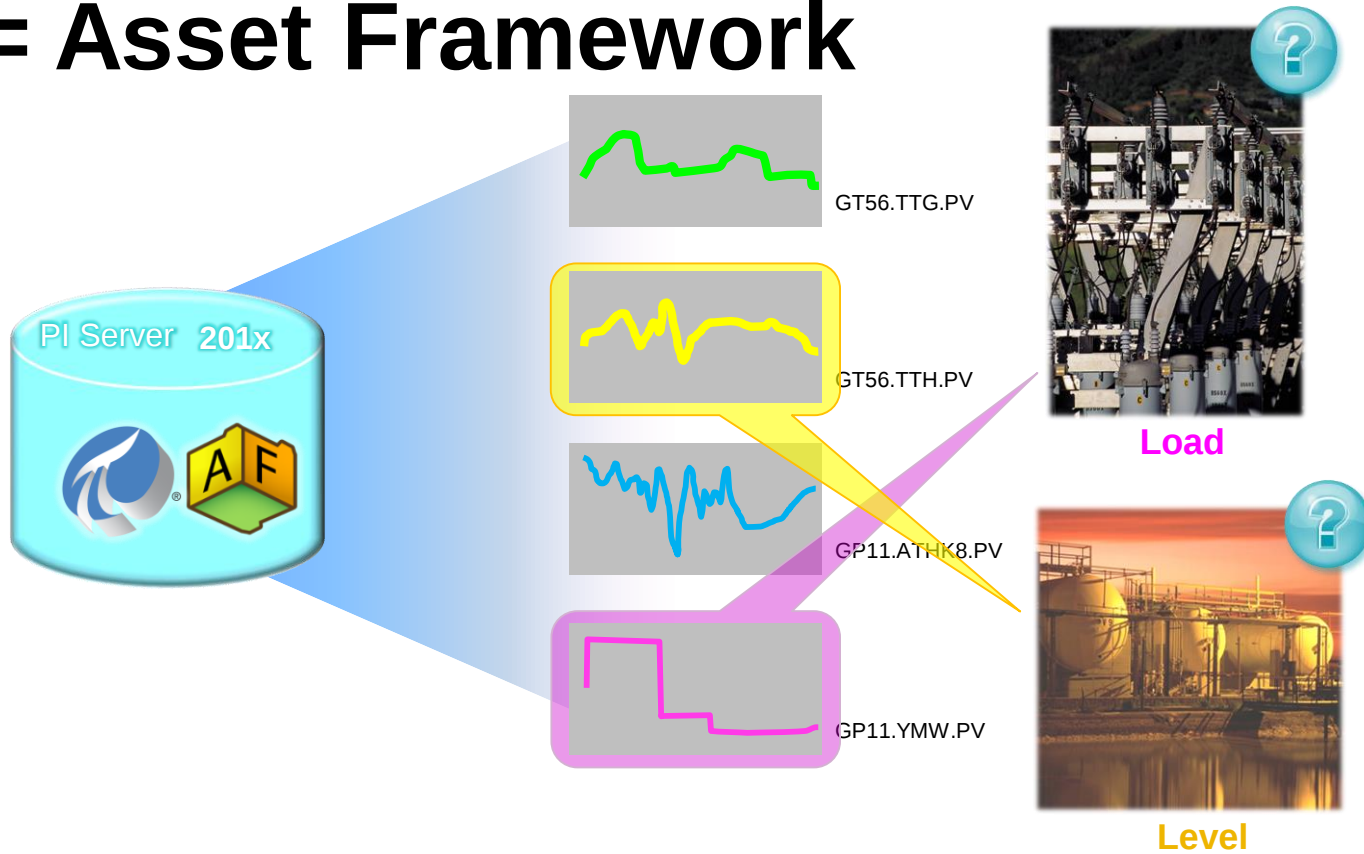
PI Notifications  
Element relative displays  
PI Coresight  
PI Webparts  
Asset based Analytics



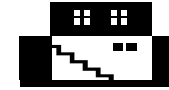
# See the full picture

| Time Series                                                                       | Time Series Modules                                                               | Time Series non Time Series Assets                                                  | Time Series non Time Series Assets<br>Asset structure                               |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|   |  |  |  |
|  |  |  |  |
| sensor                                                                            | equipment                                                                         | process unit / plant                                                                | enterprise                                                                          |

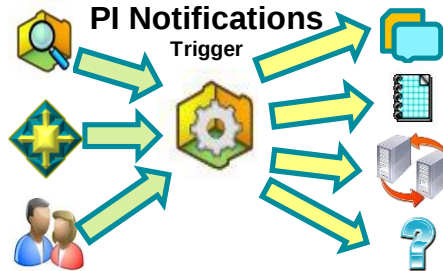
# AF = Asset Framework



# Find , Analyze, Deliver



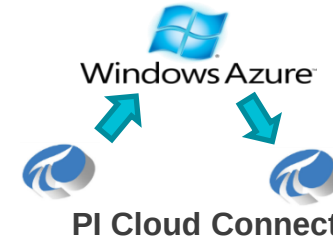
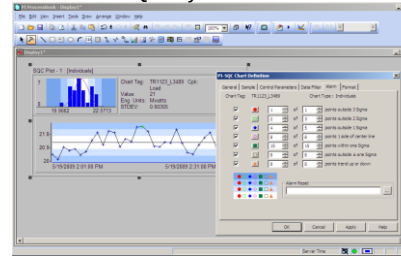
## PI ACE Advanced Computing Engine



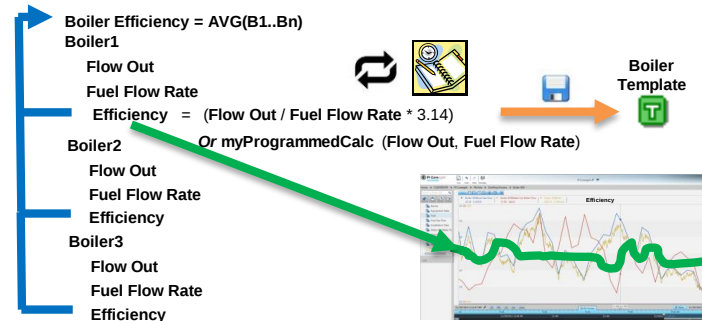
## PI System Access –PSA

- PI SDK
- AF SDK (includes AN/EF SDK)
- PI OLEDB / PI OLEDB Enterprise
- PI JDBC
- PI ODBC
- PI OPC DA/HDA Server
- PI WebServices – SOAP
- PI WebAPI – REST - ODATA
- PI API (Runtime, no Development)

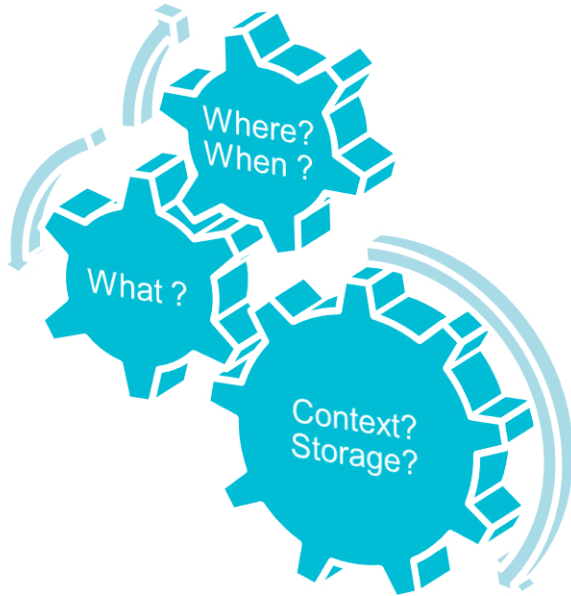
## PI SQC Statistical Quality Control



## Asset Based Analytics

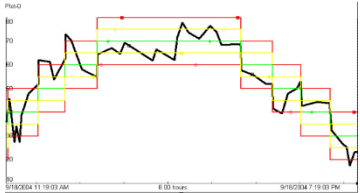
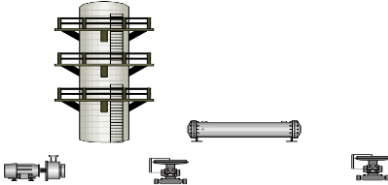
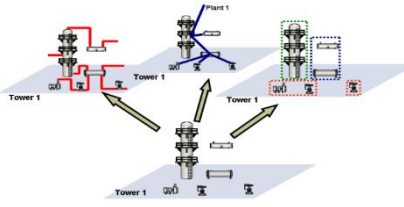
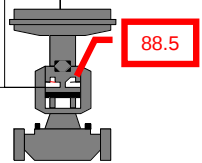
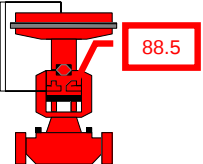
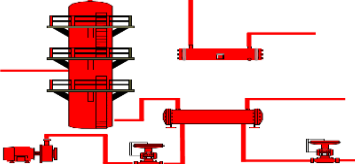
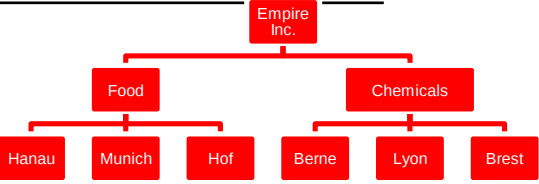


# Its always an combination !!!



|                  |                                                                                                                                                                            |                                                                                                                                                           |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Where ?</b>   | To run the analysis: <ul style="list-style-type: none"> <li>• Performance</li> <li>• Rollout</li> <li>• Availability</li> </ul>                                            | <ul style="list-style-type: none"> <li>• Client</li> <li>• Server</li> </ul>                                                                              |
| <b>When ?</b>    | To run the analysis: <ul style="list-style-type: none"> <li>• Data retrieval</li> <li>• Consumer constraints</li> <li>• Performance</li> </ul>                             | <ul style="list-style-type: none"> <li>• On event</li> <li>• On Time Schedule</li> <li>• On Condition</li> <li>• Ad hoc</li> <li>• Recalculate</li> </ul> |
| <b>What ?</b>    | Is hosting the algorithm: <ul style="list-style-type: none"> <li>• Validation</li> <li>• Reuse existing investment</li> <li>• Performance</li> </ul>                       | <ul style="list-style-type: none"> <li>• Formula (Expression)</li> <li>• .NET code</li> <li>• Existing DLL</li> <li>• 3rd party app</li> </ul>            |
| <b>Context ?</b> | What “object” is analysed <ul style="list-style-type: none"> <li>• Reusability</li> <li>• Consistency</li> <li>• Rollout</li> </ul>                                        | <ul style="list-style-type: none"> <li>• Tag</li> <li>• Module</li> <li>• Asset</li> <li>• Asset Template</li> <li>• Asset structure</li> </ul>           |
| <b>Result ?</b>  | Storage place: <ul style="list-style-type: none"> <li>• Reusability</li> <li>• Consistency</li> <li>• Performance</li> <li>• Availability</li> <li>• Validation</li> </ul> | <ul style="list-style-type: none"> <li>• Single Tag</li> <li>• Multiple Tags</li> <li>• Event frame</li> <li>• Action</li> <li>• Notification</li> </ul>  |

# Analysis Needs Context

| Time Series                                                                       | Time Series Modules                                                               | Time Series non Time Series Assets                                                 | Time Series non Time Series Assets<br>Asset structure                               |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Performance Equations (PE)                                                        | Advanced Computing Engine (ACE)                                                   | AF Formula Data Reference                                                          | Asset based Analytics                                                               |
|   |  |  |  |
|  |  |  |  |
| sensor                                                                            | equipment                                                                         | process unit / plant                                                               | enterprise                                                                          |

Analysis brought into context becomes **reusable** and allows **single point of maintenance**

# Calculations in PI

| What combination to RUN ? |                  | PI Performance Equations | PI Datalink Expression | PIProcessbook Expression | PI ACE                | PI AF Formula DR | PI Notifications | PI Asset Based Analytics |
|---------------------------|------------------|--------------------------|------------------------|--------------------------|-----------------------|------------------|------------------|--------------------------|
| Where                     | Client           |                          | X                      | X                        |                       | X                |                  |                          |
|                           | Server           | X                        |                        |                          | X                     |                  | X                | X                        |
| When                      | On event         | one only                 |                        |                          | X                     |                  | X                | X                        |
|                           | On Time Schedule | X                        |                        |                          | X                     |                  | X                | X                        |
|                           | On Condition     |                          |                        |                          | X                     |                  | X                | X                        |
|                           | Ad hoc           |                          | X                      | X                        | via Webservice        | X                |                  | evaluation button        |
|                           | Recalculate      | partly                   |                        |                          | X                     |                  |                  | backfill                 |
| What                      | Formula          | X                        | X                      | X                        | X                     | X                | X                | X                        |
|                           | .NET code        |                          |                        |                          | X                     |                  | via SDK          | planned                  |
|                           | DLL              |                          |                        |                          | X                     |                  | via SDK          | planned                  |
|                           | 3rd party app    |                          | VBA                    | VBA                      | X                     |                  | via SDK          | planned                  |
| Context                   | Tag              | X                        | X                      | X                        | X                     |                  | X                |                          |
|                           | Module           |                          | X                      | X                        | X                     |                  |                  |                          |
|                           | Asset            |                          | X                      | X                        | via AF Link Subsystem | X                | X                | X                        |
|                           | AssetTemplate    |                          |                        |                          |                       | X                | X                | X                        |
|                           | Assetstructure   |                          |                        |                          |                       |                  | X                | rollup                   |
| Result                    | Single Tag       | X                        |                        |                          | X                     |                  | X                | X                        |
|                           | Multiple Tags    |                          |                        |                          | X                     |                  | X                | X                        |
|                           | Eventframe       |                          |                        |                          | via SDK               |                  | via SDK          | X                        |
|                           | Action           |                          | VBA                    | VBA                      | .NET                  |                  | X                |                          |

# Visualize



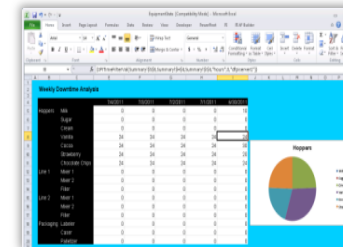
**PI Coresight:**  
*Ad Hoc Analysis &  
Collaboration  
Going mobile*



**PI ProcessBook:**  
Display authoring and Process  
monitoring



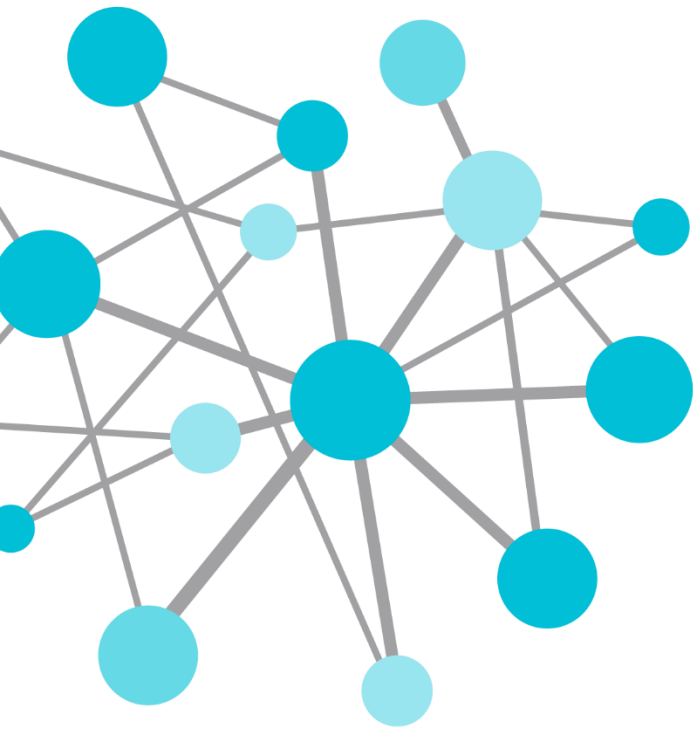
**PI WebParts:**  
Composite Apps, Shared broadly  
Integration into Portal



**PI DataLink:**  
Reporting using Microsoft  
Excel as front end

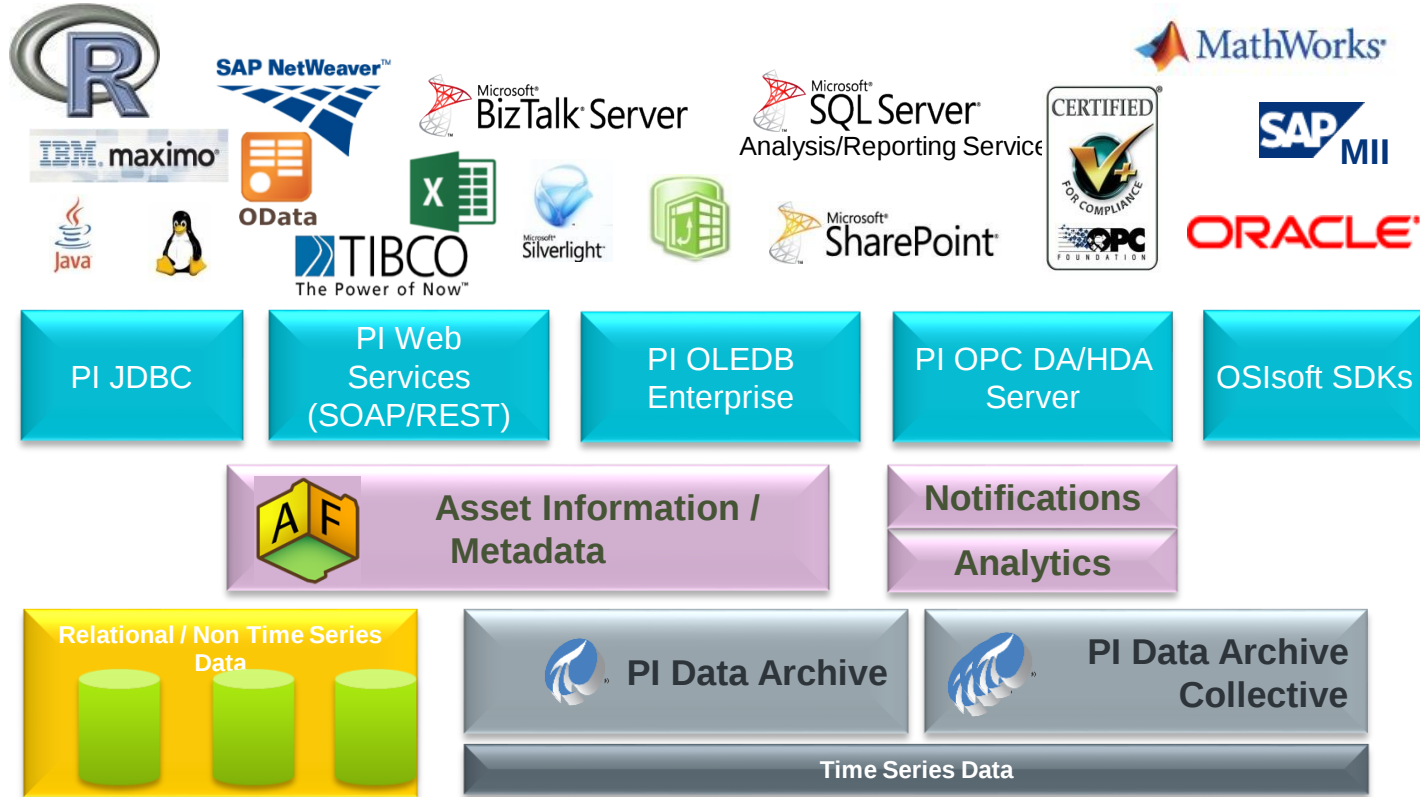
# Demo 1: Assets and Visualisation

|                             |                                                                                                                                                |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Context based Visualisation | Element relative Display <ul style="list-style-type: none"><li>• Trend</li><li>• Element name</li><li>• Value</li><li>• X-Y Plot</li></ul>     |
| Template and Symbol         | Model Builder ( Processbook 2014 !) <ul style="list-style-type: none"><li>• Add a attribute</li><li>• New Composite</li><li>• Resync</li></ul> |
| What about good old Excel   | PI Datalink <ul style="list-style-type: none"><li>• From Tag</li><li>• From Attribute</li></ul>                                                |



**What about the world  
outside of PI ?  
Or  
How to use my existing  
investment ?**

# PI System Access



# Data access support

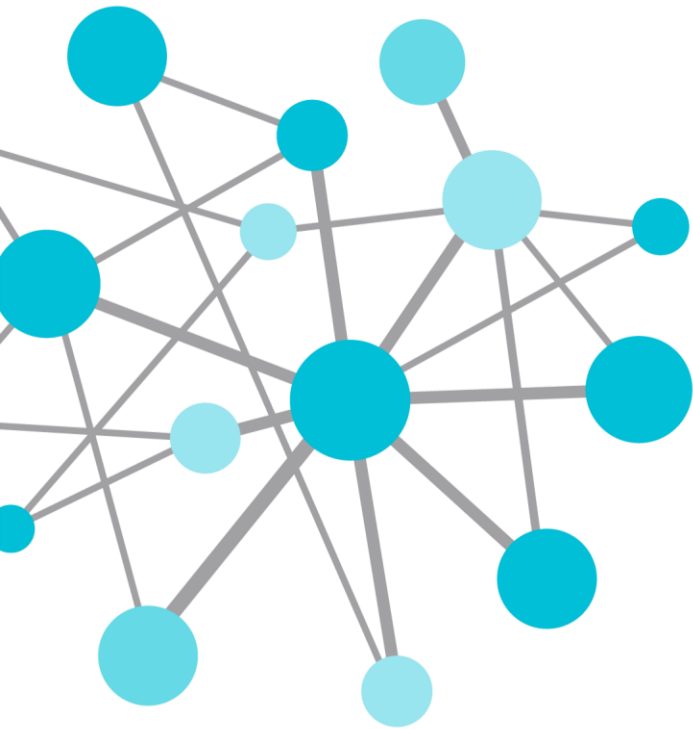
| Product                    | Real-time | Archive | Metadata (AF)        | Event Frames         | Write data            |
|----------------------------|-----------|---------|----------------------|----------------------|-----------------------|
| OLE DB & OLE DB Enterprise | Yes       | Yes     | Yes, Enterprise only | Yes, Enterprise only | Yes, Time Series only |
| JDBC                       | Yes       | Yes     | Yes                  | Yes                  | No                    |
| ODBC 2014*                 | Yes       | Yes     | Yes                  | Yes                  | tbc                   |
| PI Web Services            | Yes       | Yes     | Yes                  | Yes                  | Yes                   |
| PI System SDK (AF SDK)     | Yes       | Yes     | Yes                  | Yes                  | Yes                   |
| PI SDK                     | Yes       | Yes     | No                   | No                   | Yes                   |
| RLINK                      | Yes       | tbc     | No                   | No                   | Yes                   |

\* Release in 2014, support tbc

- Table is for summary purposes only. Consult manuals/OSIsoft to verify functionality

# Demo 2: Assets and PI System Access

|                                                                  |                                                                                 |
|------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Use your existing investment:<br>PowerPivot ( since Office 2010) | Create Datasource PI OLEDB<br>Enterprise<br>Create Pivot ( t.b.c. by Microsoft) |
| Use your NEW investment:<br>PowerBI ( since Office 2013 /365 )   | Create Datasource PI WebAPI ODATA<br>(beta)<br>Create Powerview                 |



THANK  
YOU

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