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All the Ways to Connect to PI Systems

Presented by **Leila Chaouki-Juneau**

Penny Gunterman

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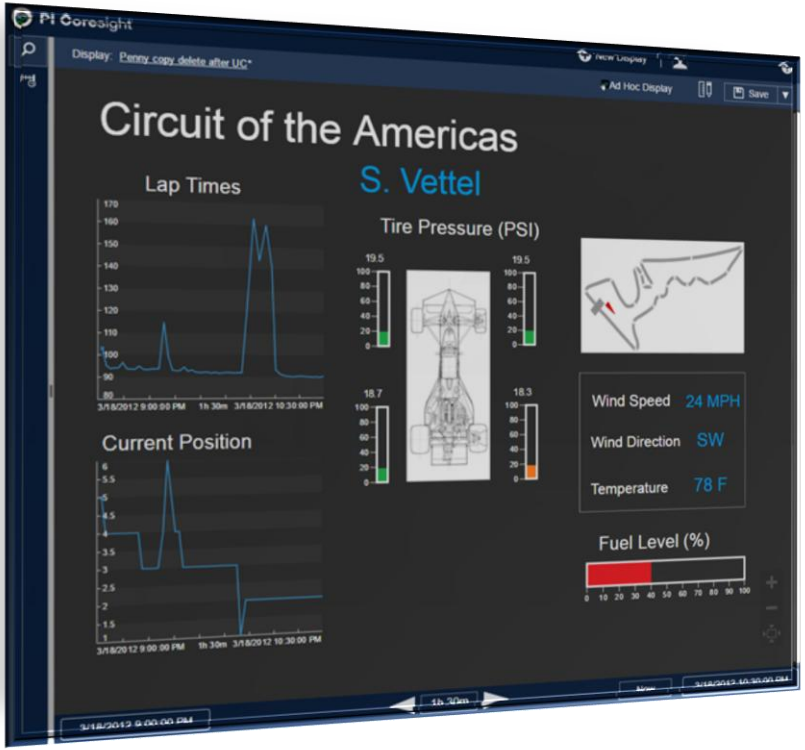
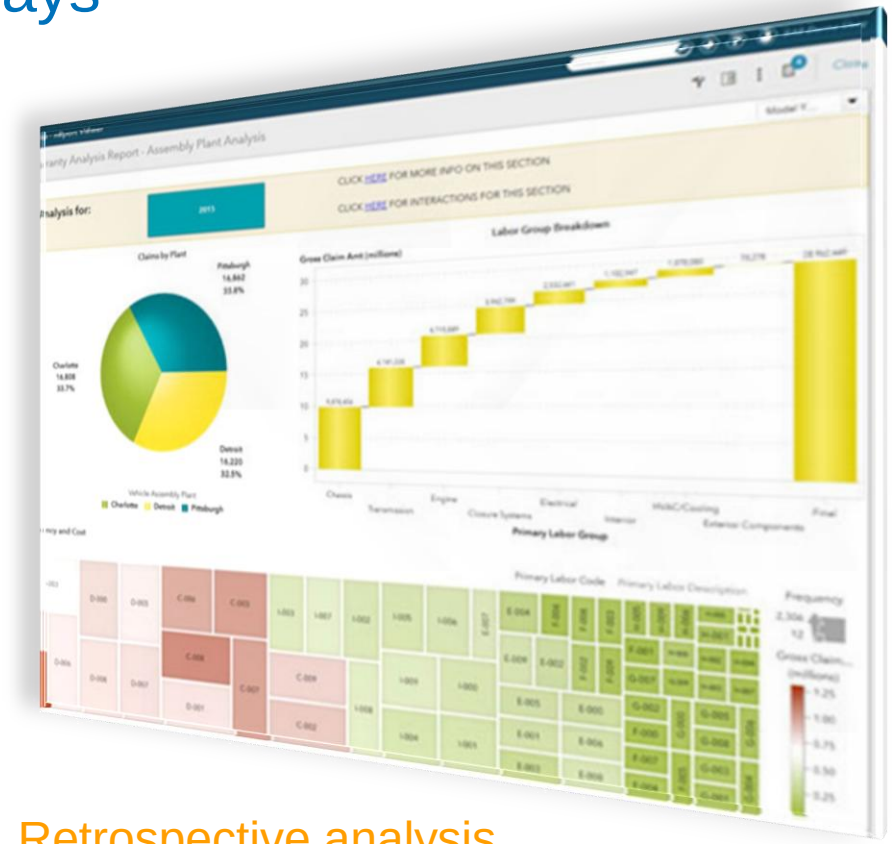
A journey of enabling rich displays



Real-time monitoring



Retrospective analysis

Image: SAS Visual Analytics from www.sas.com

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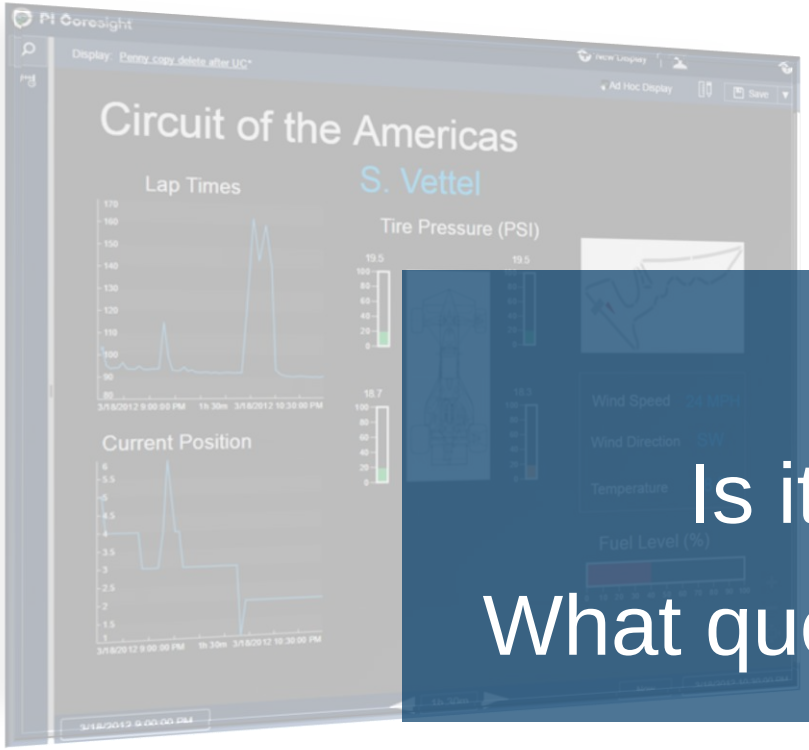
A journey of enabling rich displays



How do you get there?

Is it the most efficient way?

What questions should you ask?

Real-time monitoring

Retrospective analysis

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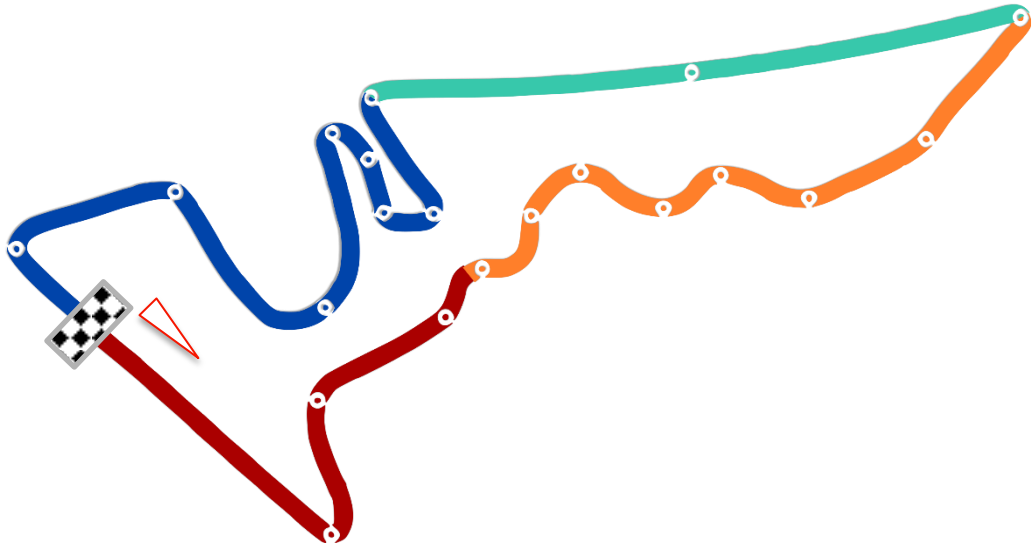
Agenda: 4 stages to get value out of your PI System

1. Get started
   - **Collect raw data**: adding a new data source
2. Maneuver the turns
   - **Metadata**: applying context
3. Achieve fast insights
   - **Visualize** and **find** the info
4. The next level and the finish line
   - Enable **business analytics**



Example: Find the Winning Formula
Lap around the Circuit of the Americas

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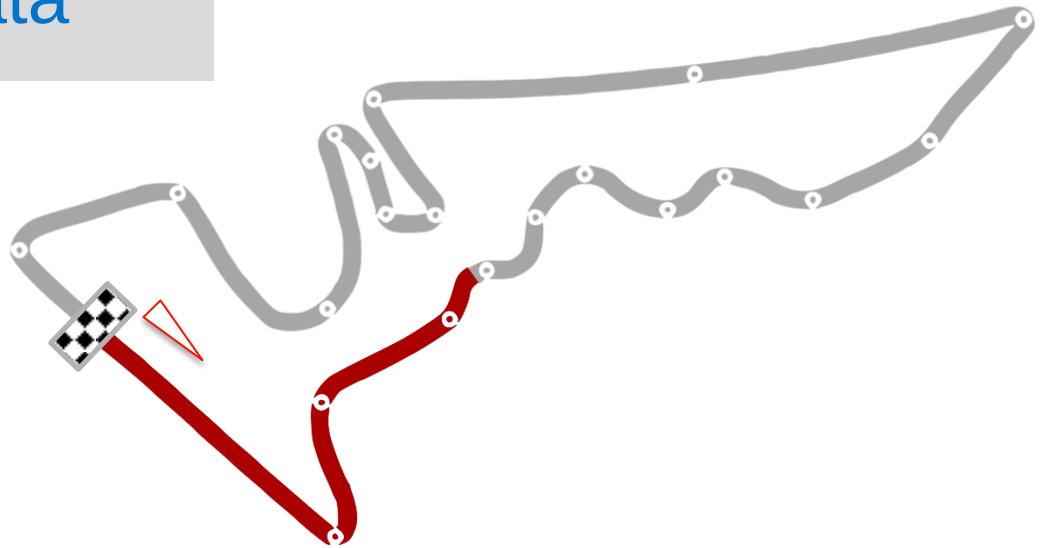
Get started with raw data



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Adding a new data source

Challenges

Can the data be brought in the PI System?

How can the data be imported?

Is this the most **effective and efficient** way to do this?

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Collecting data: Key questions to ask

1. What is the device?

2. What type of data is it?
   - Number of data streams, frequency of updates, necessary fidelity

   Vendor specific?

3. What type of protocol does this device support?
   - Standard
     - OPC, Modbus, ODBC/OLEDB connectivity, RDBMS embedded
   - Non-Standard
     - OSIsoft Development & Technical Support

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Ex: Answering key questions

1. What is the device?
   - Telemetry device collects data as the cars go around the racetrack
2. What type of data is it?
   - Many data streams, high frequency
     Need high fidelity information
3. What type of protocol does this device support?
   - Non-Standard: Need to access data via the web server
4. Solution:
   - PowerShell script to query source data
   - Parse text files with PI Interface for Universal File Loader (UFL)

Lap Times		
Lap 1		
DriverId	**Position**	**Time**
alonso	1	1:34.494
vettel	2	1:35.274
webber	3	1:36.329
hamilton	4	1:36.991
petrov	5	1:38.084
michael_schumacher	6	1:38.633
rosberg	7	1:39.139
massa	8	1:39.979
buemi	9	1:40.611
button	10	1:40.998
perez	11	1:41.433
alguersuari	12	1:41.876
maldonado	13	1:42.255
resta	14	1:42.808
trulli	15	1:43.553
kovalainen	16	1:44.276
heidfeld	17	1:45.164
sutil	18	1:46.107
liuzzi	19	1:46.737
barrichello	20	1:47.077
glock	21	1:47.556
karthikeyan	22	1:48.183
ambrosio	23	1:48.573
kobayashi	24	1:57.590
Lap 2		
DriverId	**Position**	**Time**
alonso	1	1:30.812
vettel	2	1:30.633
webber	3	1:30.827
hamilton	4	1:31.189
petrov	5	1:32.394
michael_schumacher	6	1:32.839

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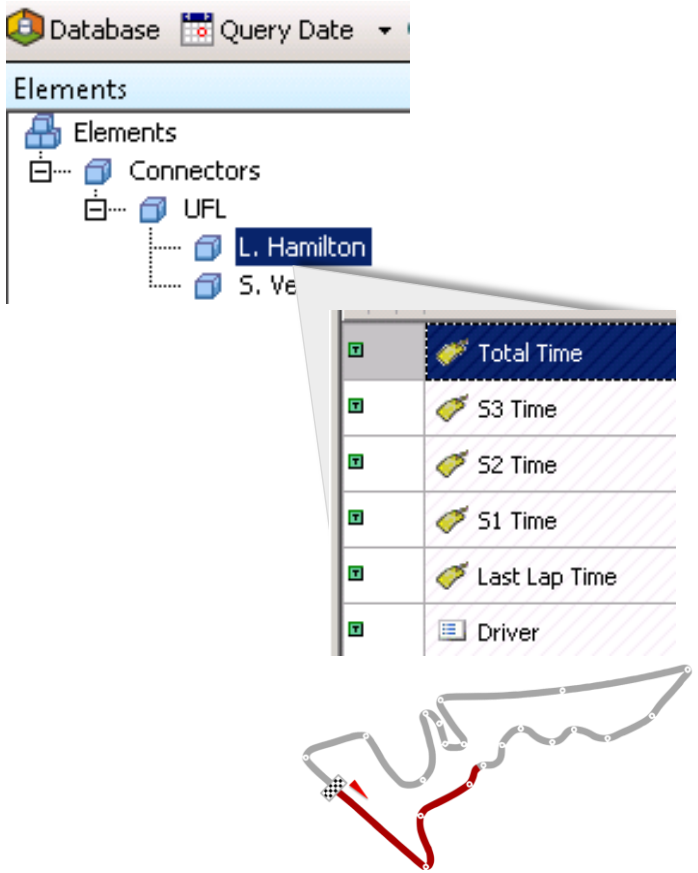
Ex: Choosing the best technology

New option: **PI Connector for UFL**

No more temporary text files needed: write directly to the UFL connector Rest endpoint.

- Benefits
  - Automatically creates tags, elements/attributes
  - Easier configuration
  - No scan class
  - Creates event frames

Now you just need to implement the solution!



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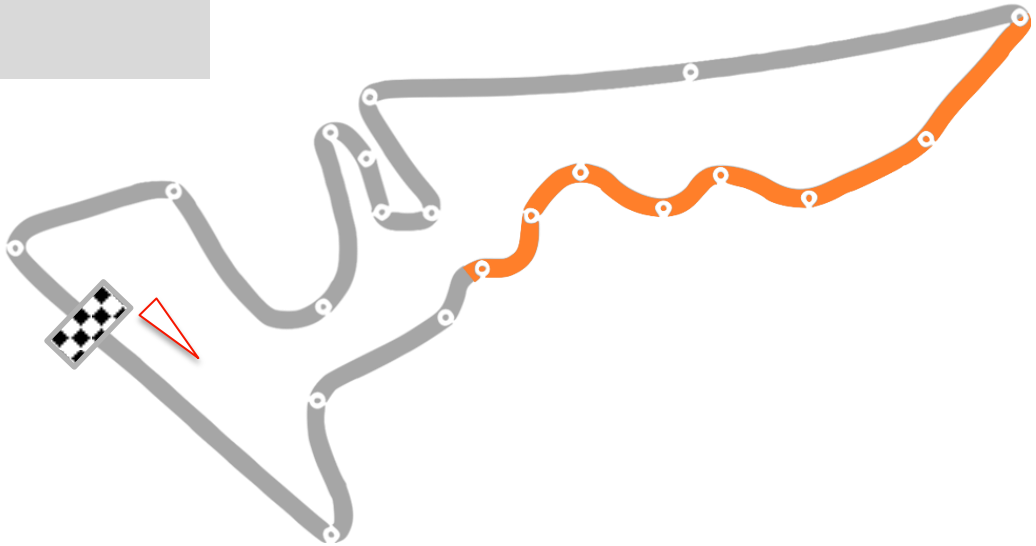
Maneuver meta data



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Context adds meaning to your data

Challenges:

- Meta data is needed to transform **raw data** into **information**.

Speed

107

mi/hr

Driver: Hamilton

Austin, TX

- Important: Define the **use case**

→ Gives you **focus** on what meta-data is relevant to include

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Meta data: Key questions to ask

1. What meta data will put data into context?

2. What are the data characteristics?
   How often does it update?
   - Often ➡ Store the data in a PI Point
   - Not often/Never ➡ Data reference via PI AF

3. Where is the meta data stored?
   - File, Web Site, Relational Database, etc

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Ex: Meta data: Add the racing team

1. What context will help the user?
   - Want to compare by car constructor (team)
2. What are the data characteristics?
   How often does it update?
   - Many data streams. History is not required. Data type is string. Static information
3. Where is the meta data stored?
   - Web site
4. Options
   - PI Interface for RDBMS
   - PowerShell to pull in data from the web into my SQL Server and use a linked AF Table
   - **Import the table from the web into an internal AF Table**

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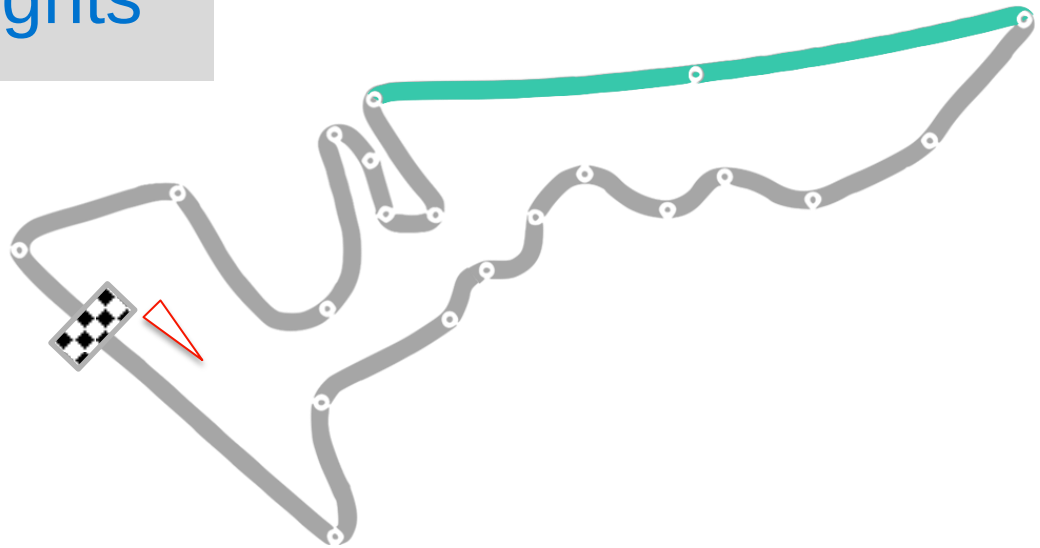
Visualization & fast insights



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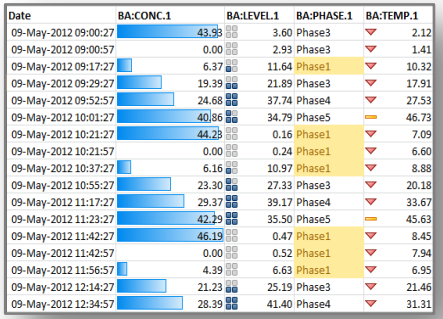
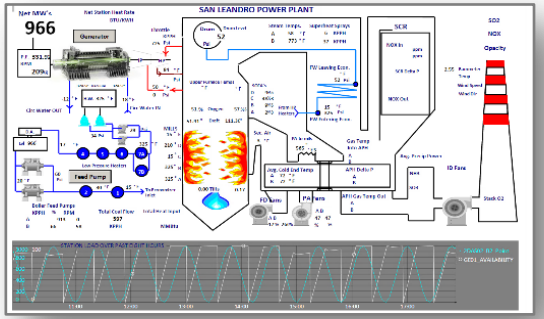
The right visualization makes information consumable



Date	BA:CONC.1	BA:LEVEL.1	BA:PHASE.1	BA:TEMP.1
09-May-2012 09:00:27	43.93	3.60	Phase3	2.12
09-May-2012 09:00:57	0.00	2.93	Phase3	1.41
09-May-2012 09:17:27	6.37	11.64	Phase1	10.32
09-May-2012 09:29:27	19.39	21.89	Phase3	17.91
09-May-2012 09:52:57	24.68	37.74	Phase4	27.53
09-May-2012 10:01:27	40.86	34.79	Phase5	46.73
09-May-2012 10:21:27	44.23	0.16	Phase1	7.09
09-May-2012 10:21:57	0.00	0.24	Phase1	6.60
09-May-2012 10:37:27	6.16	10.97	Phase1	8.88
09-May-2012 10:55:27	23.30	27.33	Phase3	20.18
09-May-2012 11:17:27	29.37	39.17	Phase4	33.67
09-May-2012 11:23:27	42.29	35.50	Phase5	45.63
09-May-2012 11:42:27	46.19	0.47	Phase1	8.45
09-May-2012 11:42:57	0.00	0.52	Phase1	7.94
09-May-2012 11:56:57	4.39	6.63	Phase1	6.95
09-May-2012 12:14:27	21.23	25.19	Phase3	21.46
09-May-2012 12:34:57	28.39	41.40	Phase4	31.31

Table view



Process view

Geospatial view

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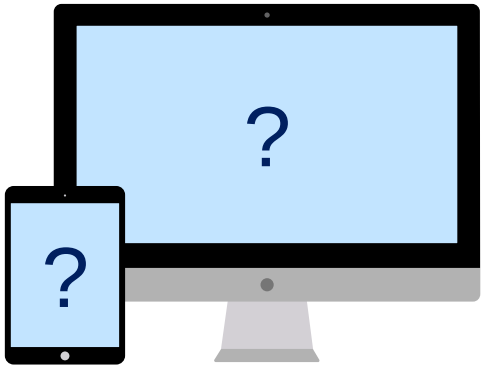
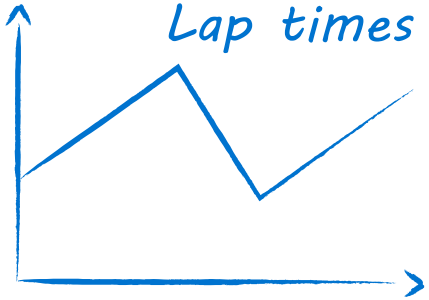
Choosing the right visualization: Key questions to ask

1. How do you view data today?

2. What tools do you want to use?
   - Excel, web browser



3. **Pro tip**: Can you sketch what your ideal view looks like?



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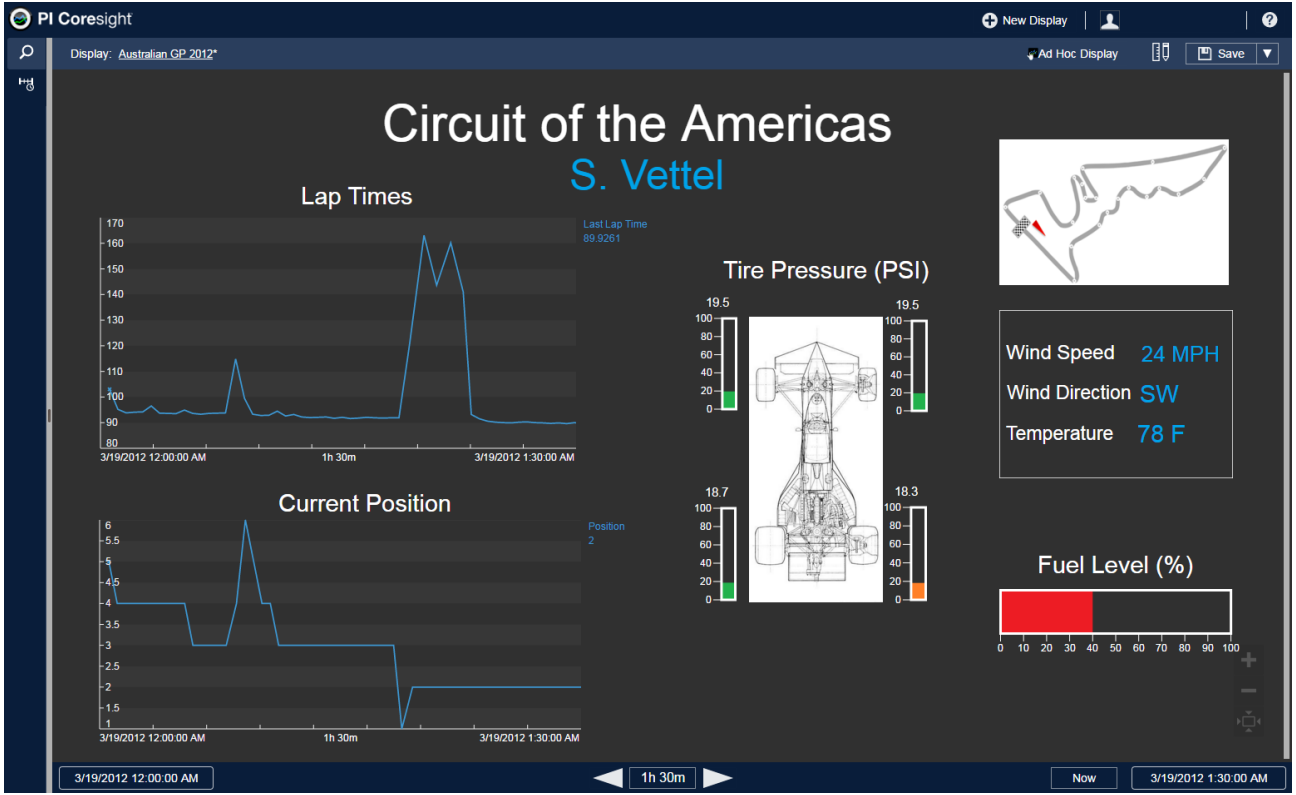
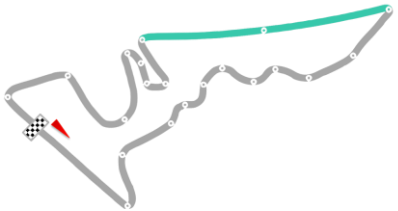
Ex: Enable real-time monitoring with PI Coresight





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Help users find data: Organize data in multiple views

In addition to a flat list of drivers

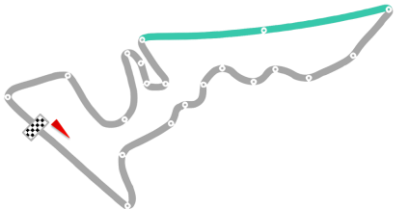
Elements

- UFL
  - S. Vettel
  - L. Hamilton

Some users may want to search by team

Elements

- UFL
  - Ferrari
    - S. Vettel
  - Mercedes
    - L. Hamilton



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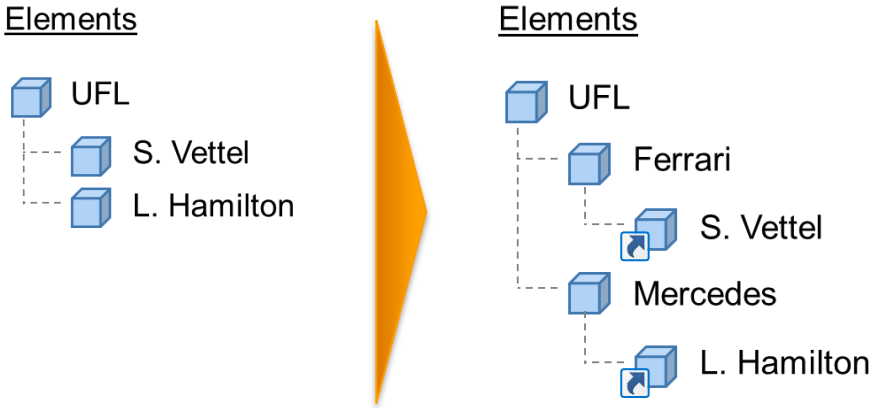
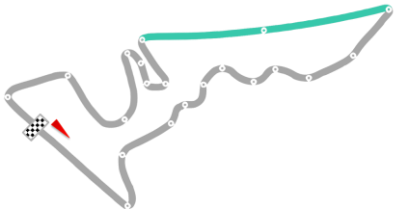
Same data can be organized in multiple views

Create views by group, geography, or process



Options:

- PI System Explorer
- PI Builder
- AF SDK



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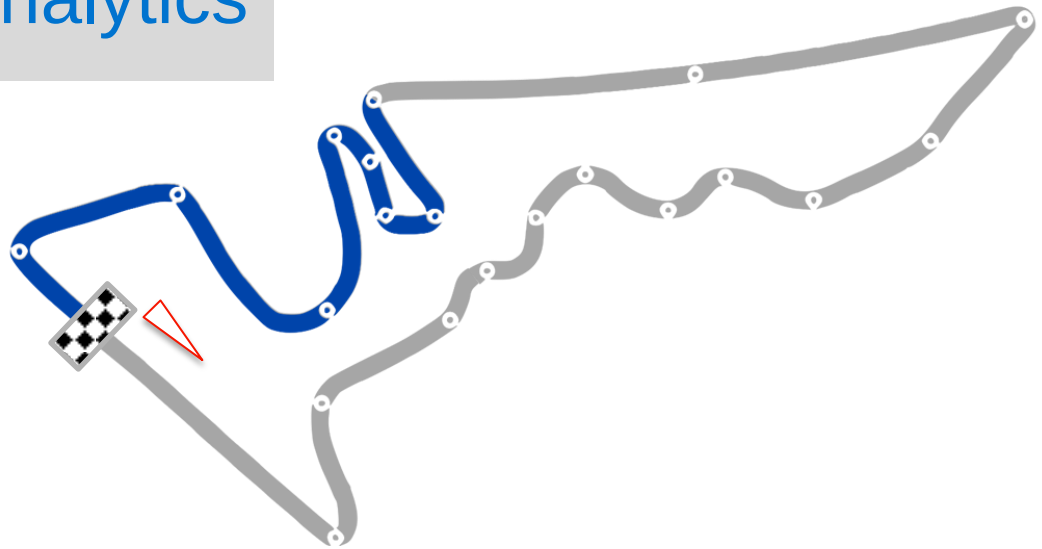
Strong finish: Business analytics



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Operational data is a piece of your larger business landscape

Business analytics blends multiple data sets to support your strategy.

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Business analytics: Key questions to ask

Analytics Packages

Visual Analytics

Excel, tableau, QlikView, DATAWATCH, esri, TIBCO Spotfire, COGNOS

Statistical Analytics

R, Hadoop, SAS, python, SAP

- Which tools do you want to use?
- Do you have a data warehousee?
- What decision are you driving toward?
  How does this add business value?
- What data sets would support that decision?
  Operational, financial, market

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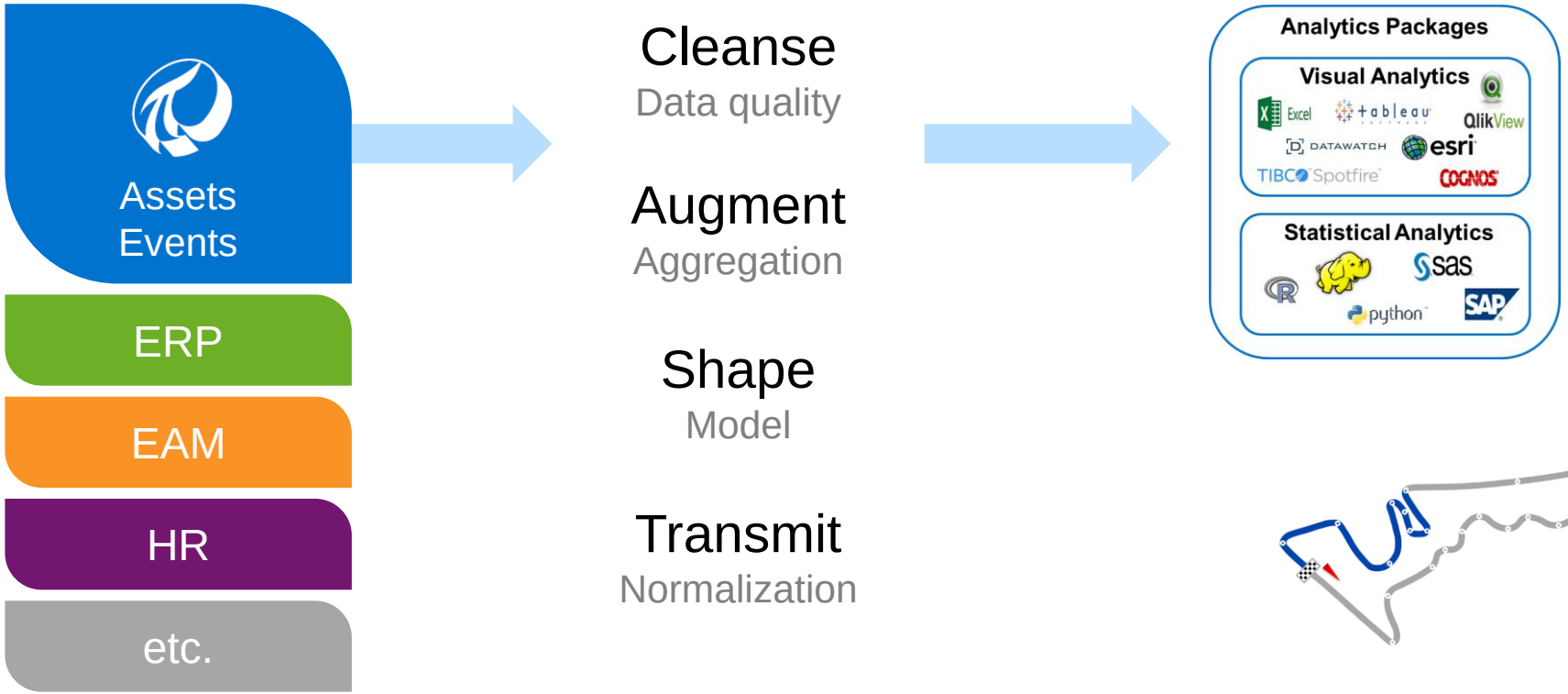
No coding needed: PI Integrator for Business Analytics



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Develop winning strategies with business analytics tools

Image: SAS Visual Analytics from www.sas.com

- Benchmarking
- Fleet-wide performance comparisons
- Large multivariate analysis

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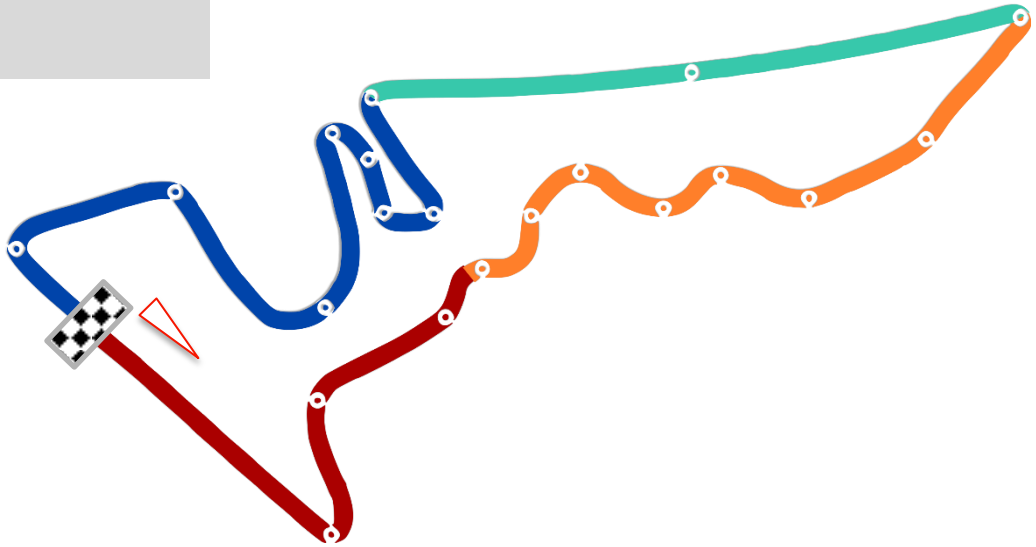
Summary



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Set your team up for success

Collect → Contextualize → Visualize → Analyze

Understand the use case
Understand the users
Choose the technology that best fits their needs

Goal: Get the most value from your data

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Resources

OSIsoft. Tech Support

PI Square
The OSIsoft Community

- PI Connector for UFL
- PI Coresight
- PI Integrator for Business Analytics

- Master PI
- PI Developers Club

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Contact Information

Leila Chaouki-Juneau
lchaouki-juneau@osisoft.com
Customer Support Engineer
OSIsoft, LLC

Penny Gunterman
hgunterman@osisoft.com
Product Marketing Manager
OSIsoft, LLC

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Danke

Gracias

Merci

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