# Getting Ready for Real-time and Advanced Analysis

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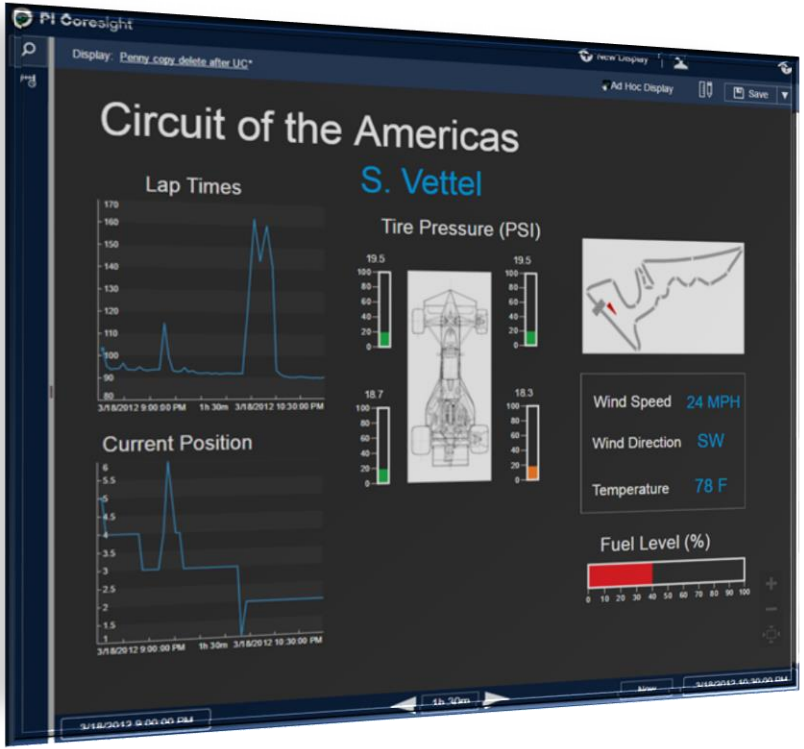
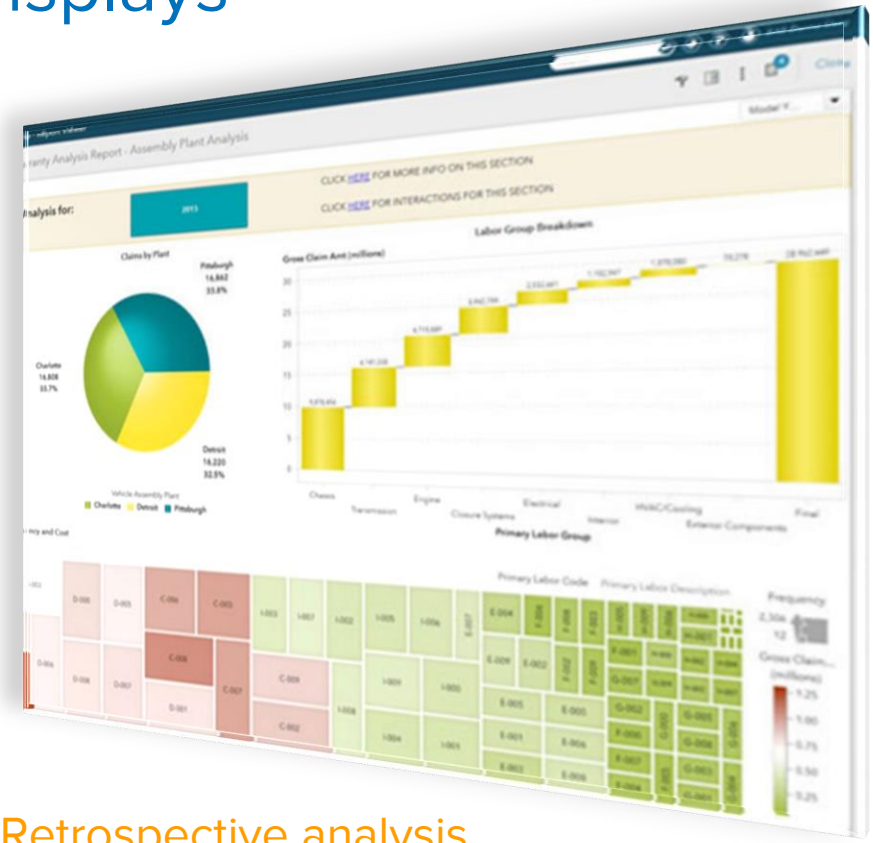
November 2, 2016

OSIsoft

# A Journey of Enabling Rich Displays



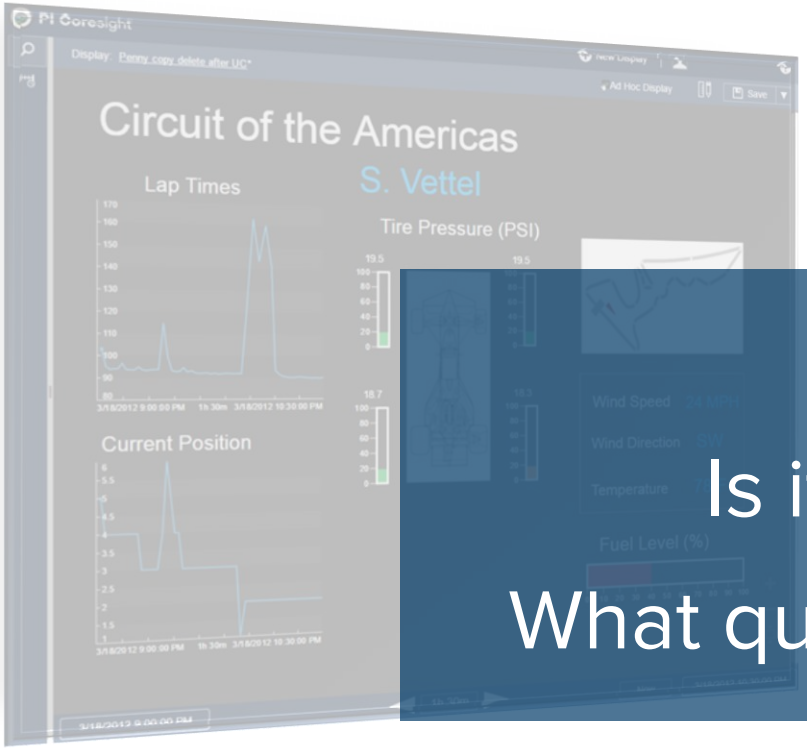

Real-time monitoring

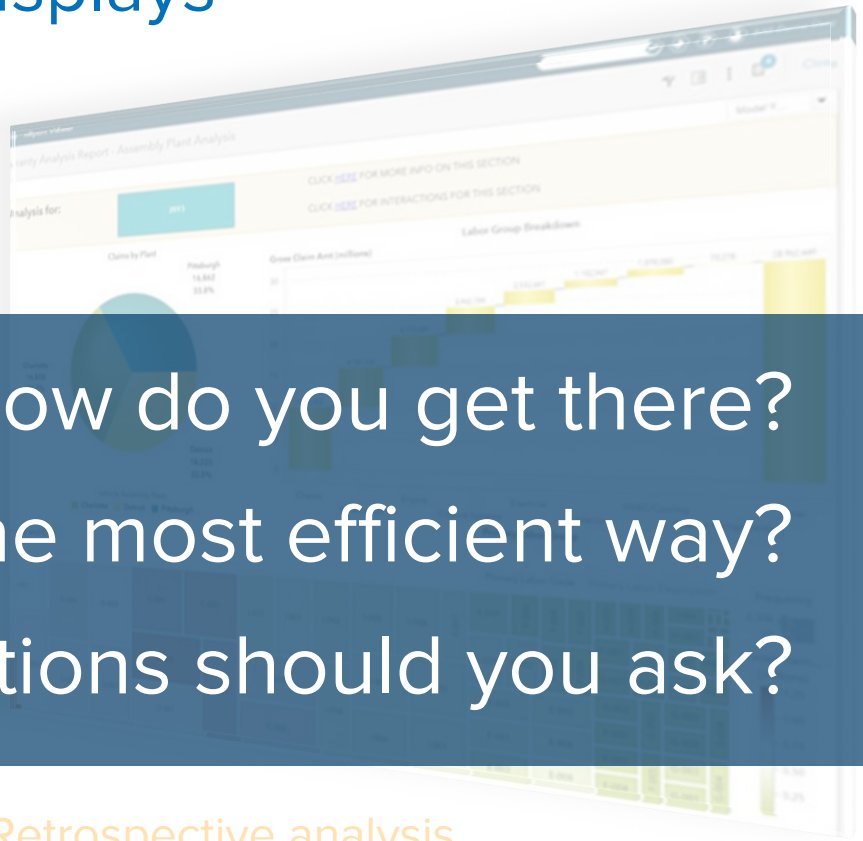



Retrospective analysis

Image: SAS Visual Analytics from www.sas.com

# A Journey of Enabling Rich Displays



How do you get there?

Is it the most efficient way?

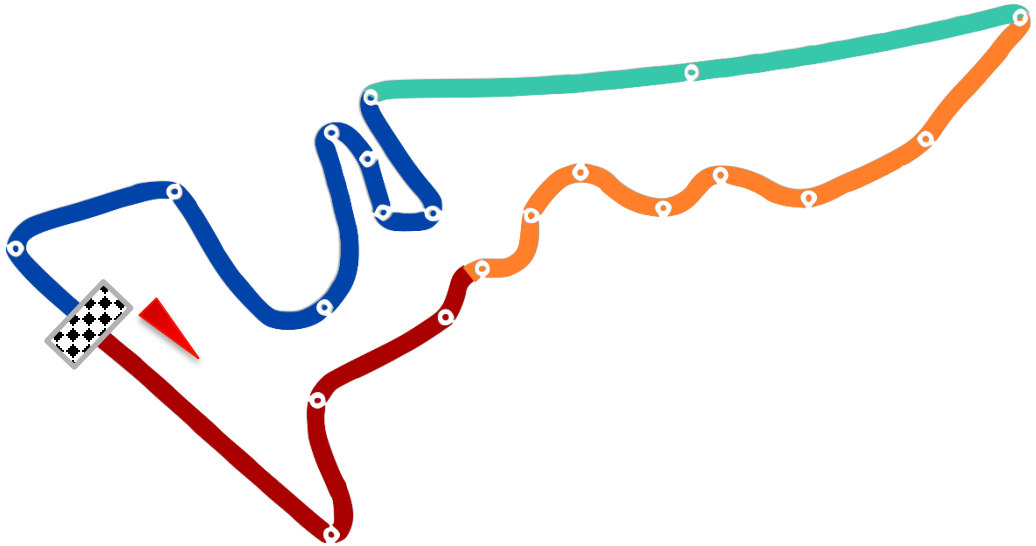
What questions should you ask?

Real-time monitoring

Retrospective analysis

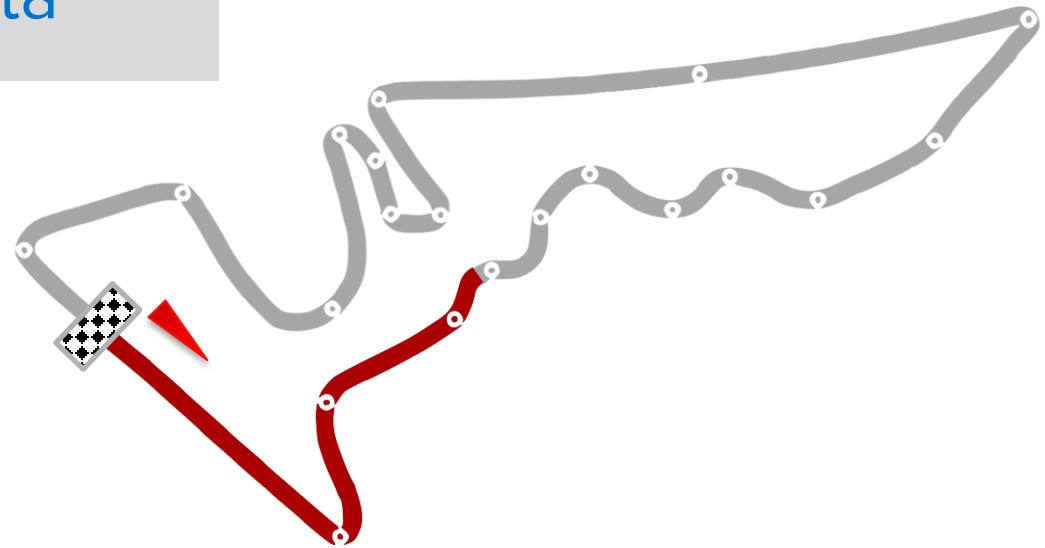
# Agenda: 4 Stages to Get Value

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

# Get started with raw data



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

# 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?

# Collecting Data: Key Questions

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

# Ex: Answering 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 |

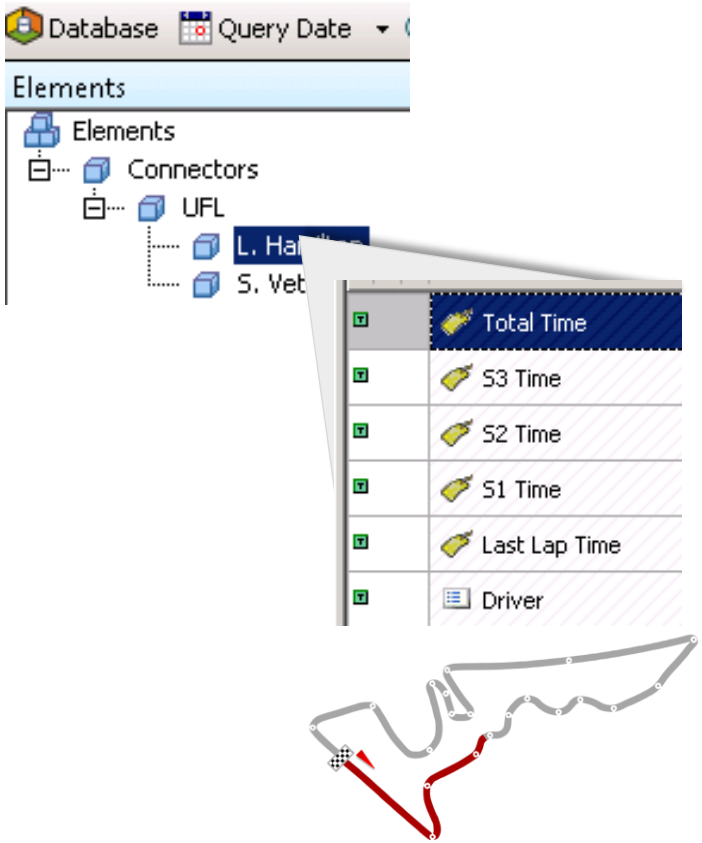
# Ex: Choosing the Best Technology

## New option: PI Connector for UFL

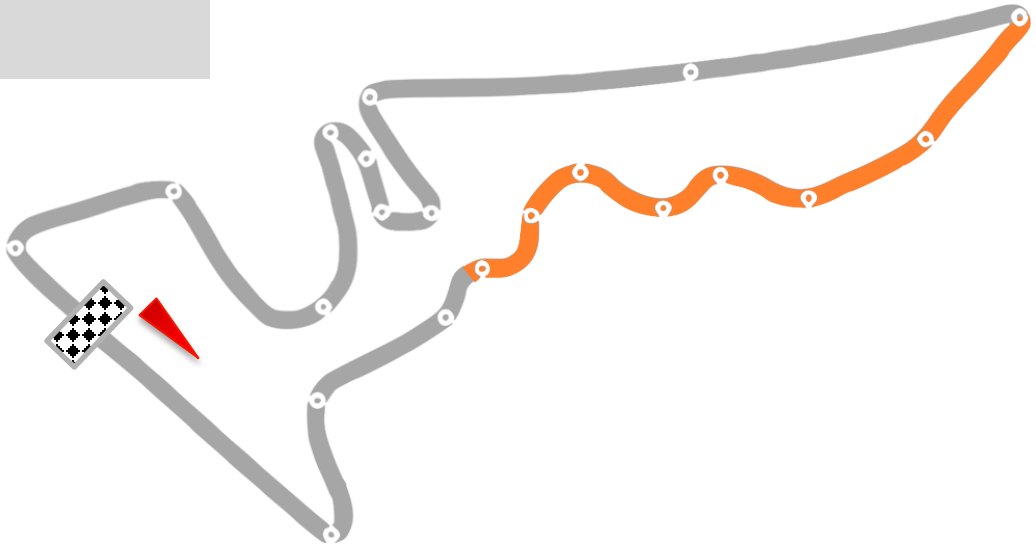
No more temporary text files needed: write directly to the UFL connector Rest endpoint.

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

Now you implement your data collection solution!



# Maneuver meta data



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

# 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

# Meta Data: Key Questions

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

# Ex: Meta Data: Add the Racing Team

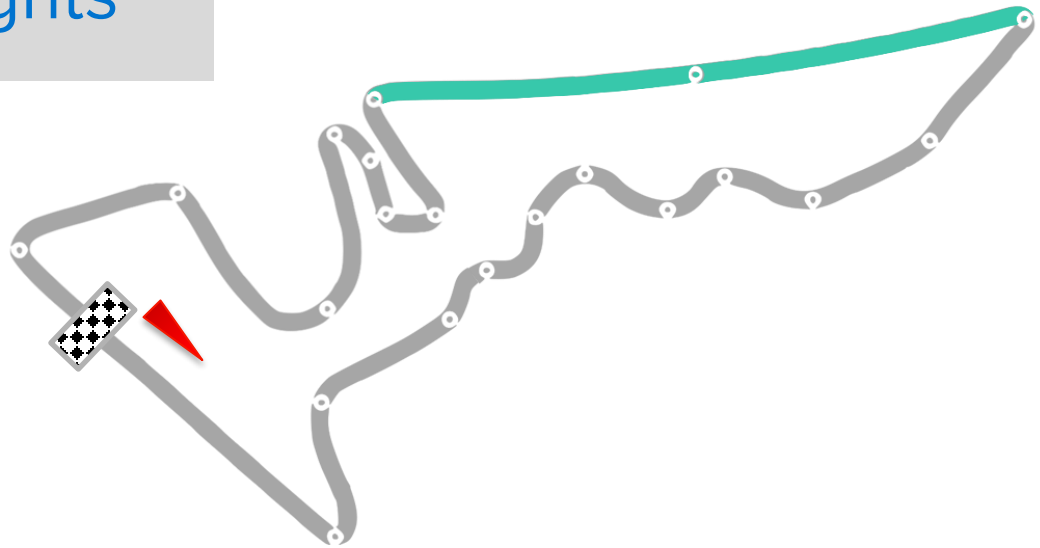
1. What context will help the user?
   - Want to compare by car constructor (team)

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**

# Visualization & fast insights



*Example: Find the Winning Formula*
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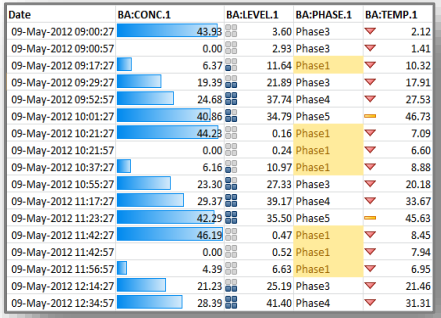
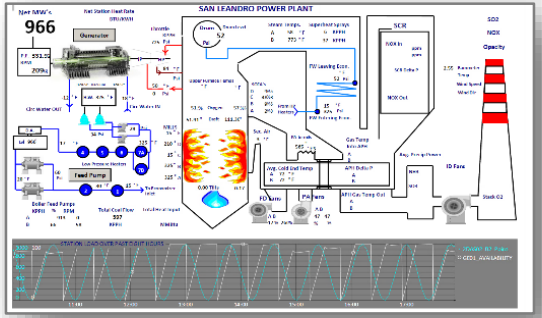
# The Right Visualization: Consumable Data

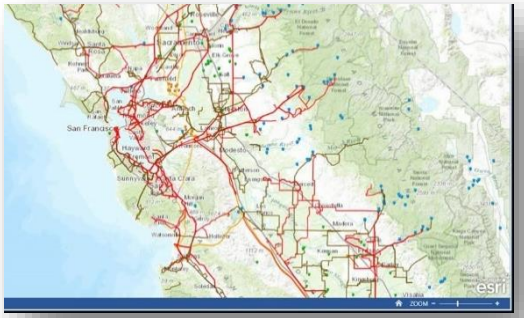


| Date | BA:CONC.1 | BA:LEVEL.1 | BA:PHASE.1 | BA:TEMP.1 |
|---|---|---|---|---|
| 09-May-2012 09:00:27 | 43.93 | 3.60 | Phase3 | 2.12 |
| 09-May-2012 09:00:57 | 0.00 | 2.93 | Phase3 | 1.41 |
| 09-May-2012 09:17:27 | 6.37 | 11.64 | Phase1 | 10.32 |
| 09-May-2012 09:29:27 | 19.39 | 21.89 | Phase3 | 17.91 |
| 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



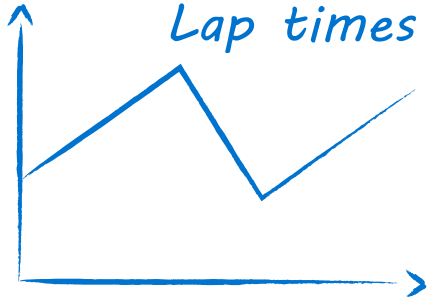
Geospatial view

# Visualization: Key Questions

1. How do you view data today?

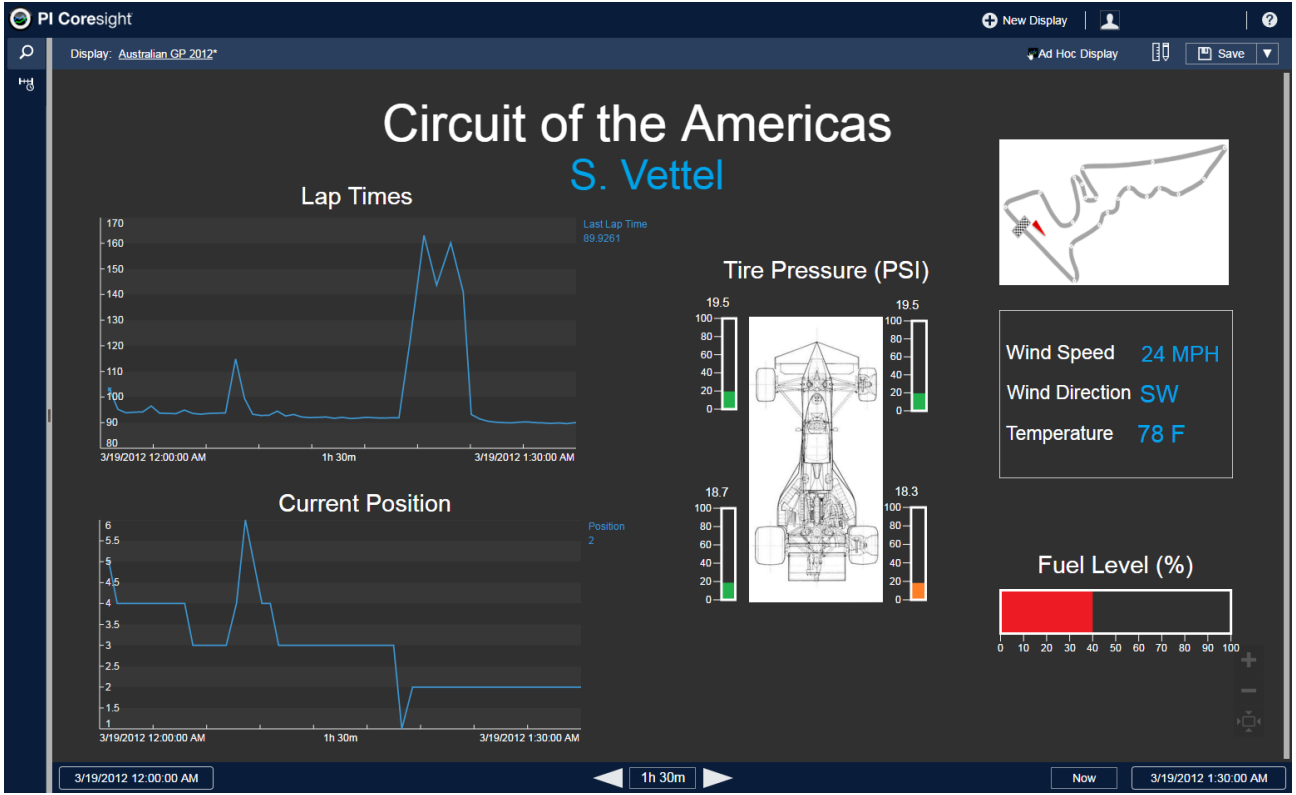
2. What tools do you want to use?
   - Excel, web browser

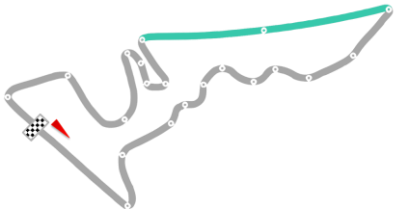

3. Pro tip: Can you sketch what your ideal view looks like?





# Ex: Real-Time Monitoring with PI Coresight



# Help Users Find Data

In addition to a flat list of drivers

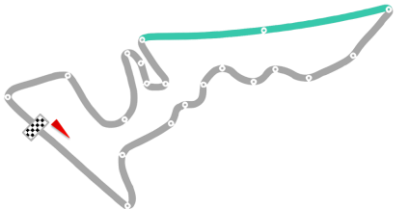
Elements

- UFL
  - S. Vettel
  - L. Hamilton

Some users may want to search by team

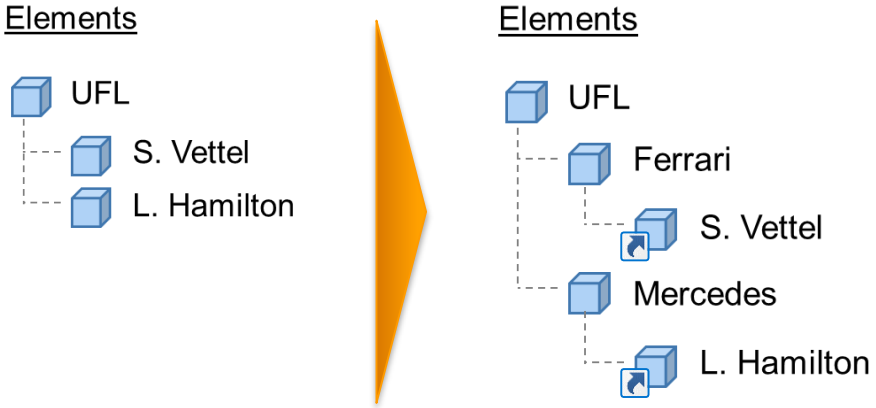
Elements

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



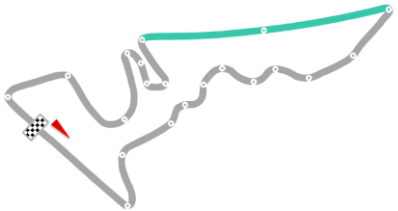
# Organize Data in Multiple Views

Create views by group, geography, or process

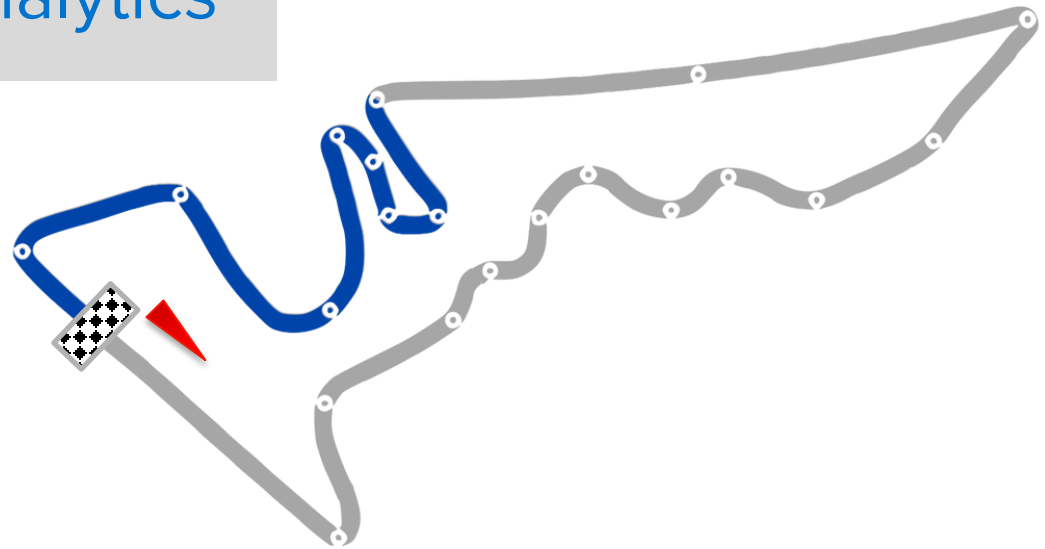



Options:

- PI System Explorer
- PI Builder
- AF SDK



# Strong finish: Business analytics



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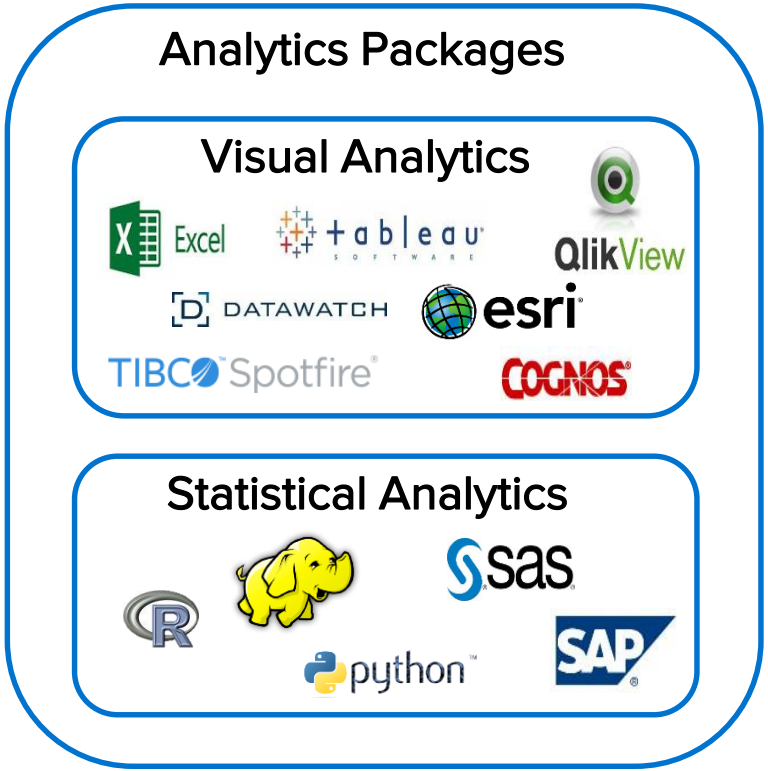
Lap around the Circuit of the Americas

# The Larger Business Landscape


Business analytics blends multiple data sets to support your strategy.

# Business Analytics: Key Questions




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

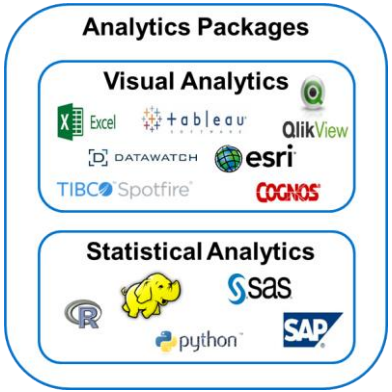
# PI Integrator for Business Analytics


**Cleanse**
Data quality

**Augment**
Aggregation

**Shape**
Model

**Transmit**
Normalization




# Winning Strategies with Business Analytics Tools

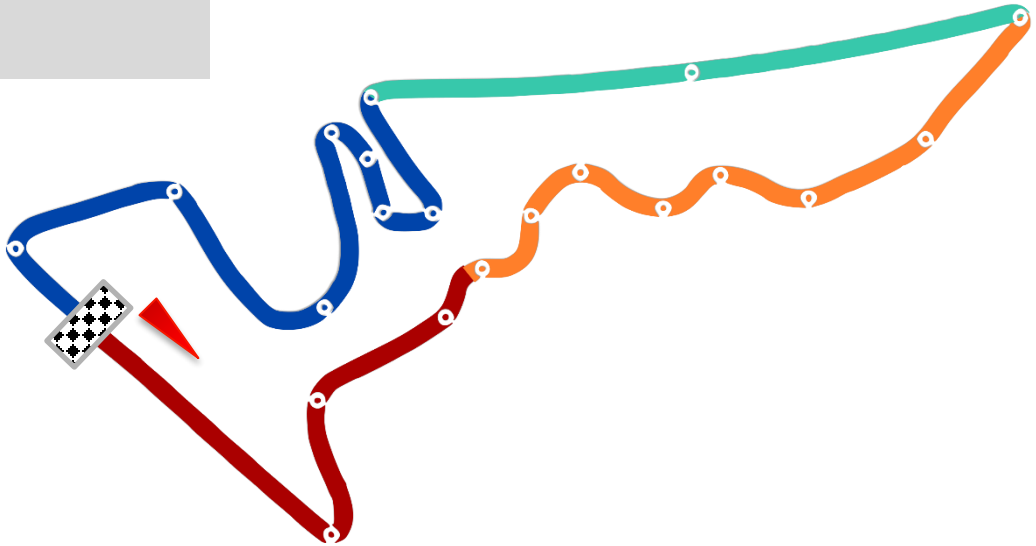

Image: SAS Visual Analytics from www.sas.com

Benchmarking

Fleet-wide performance comparisons

Large multivariate analysis

# 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

# 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

# Contact Information

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OSIsoft, LLC

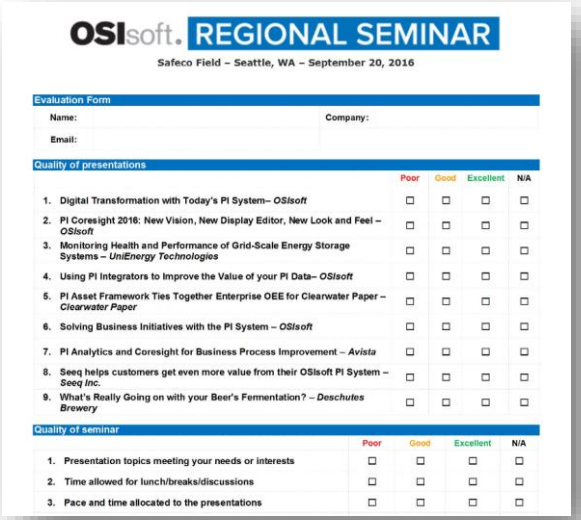
# Questions

Please wait for the **microphone** before asking your questions

State your
**name & company**

# Please remember to…

Complete the Survey
for this session



OSIsoft. REGIONAL SEMINAR

Safeco Field – Seattle, WA – September 20, 2016

**Evaluation Form**

Name: Company:

Email:

**Quality of presentations**

| | Poor | Good | Excellent | N/A |
|---|---|---|---|---|
| 1. Digital Transformation with Today's PI System– *OSIsoft* | ☐ | ☐ | ☐ | ☐ |
| 2. PI Coresight 2016: New Vision, New Display Editor, New Look and Feel – *OSIsoft* | ☐ | ☐ | ☐ | ☐ |
| 3. Monitoring Health and Performance of Grid-Scale Energy Storage Systems – *UniEnergy Technologies* | ☐ | ☐ | ☐ | ☐ |
| 4. Using PI Integrators to Improve the Value of your PI Data– *OSIsoft* | ☐ | ☐ | ☐ | ☐ |
| 5. PI Asset Framework Ties Together Enterprise OEE for Clearwater Paper – *Clearwater Paper* | ☐ | ☐ | ☐ | ☐ |
| 6. Solving Business Initiatives with the PI System – *OSIsoft* | ☐ | ☐ | ☐ | ☐ |
| 7. PI Analytics and Coresight for Business Process Improvement – *Avista* | ☐ | ☐ | ☐ | ☐ |
| 8. Seeq helps customers get even more value from their OSIsoft PI System – *Seeq Inc.* | ☐ | ☐ | ☐ | ☐ |
| 9. What's Really Going on with your Beer's Fermentation? – *Deschutes Brewery* | ☐ | ☐ | ☐ | ☐ |

**Quality of seminar**

| | Poor | Good | Excellent | N/A |
|---|---|---|---|---|
| 1. Presentation topics meeting your needs or interests | ☐ | ☐ | ☐ | ☐ |
| 2. Time allowed for lunch/breaks/discussions | ☐ | ☐ | ☐ | ☐ |
| 3. Pace and time allocated to the presentations | ☐ | ☐ | ☐ | ☐ |

# Thank You