Self-service Process Analytics at Total Refining & Chemicals Improves Overall Equipment Effectiveness

Presented by **Fabrice Leclercq**

© Copyright 2017 OSIsoft, LLC

Company Profile -

Total is the world's **4th**-ranked oil and gas company[1]

and a global **leader** in solar energy with SunPower.

WITH OPERATIONS IN MORE THAN

110 COUNTRIES,

we have over **96,000 employees** who are fully committed to better energy.

[1] Based on market capitalization in U.S. dollars at December 31, 2015

© Copyright 2017 OSIsoft, LLC

Our Activities

EXPLORE AND PRODUCE

1. Oil and Gas
2. Solar
3. Biomass

TRANSFORM AND DEVELOP

4. Specialty Chemicals
5. Refining – Petrochemicals

SHIP AND MARKET

6. Trading – Shipping
7. Marketing and Services



© Copyright 2017 OSIsoft, LLC

Our Key Indicators in 2015

700+
PRODUCTION FACILITIES

$10.5B*
ADJUSTED NET INCOME
* €9.5B

$7.39B
ALLOCATED TO R&D between 2015 and 2019

$165.4B*
REVENUE
* €149B

96,019
EMPLOYEES

$23B*
ORGANIC INVESTMENT
* €20.7B

* Employees on the payroll as of Dec. 31, 2015

© Copyright 2017 OSIsoft, LLC

Our Ambition: To Become The Responsible Energy Major



Produce, process and supply **affordable** energy while meeting the **highest HSE standards**

Supply a responsible energy mix consistent with the IEA's 2°C scenario

Introduce solutions that promote **responsible energy use** by our customers

Be recognized for our convenient, quality **local service**

This is what it means to be Committed to Better Energy

© Copyright 2017 OSIsoft, LLC



TOWARDS A DATA-DRIVEN TOTAL

TRENDMINER IN TOTAL REFINING & CHEMICALS DIGITAL ROADMAP

© Copyright 2017 OSIsoft, LLC

4 Industrial Priorities





4 INDUSTRIAL PRIORITIES

- Safety
- Availability
- Cost control
- Energy efficiency

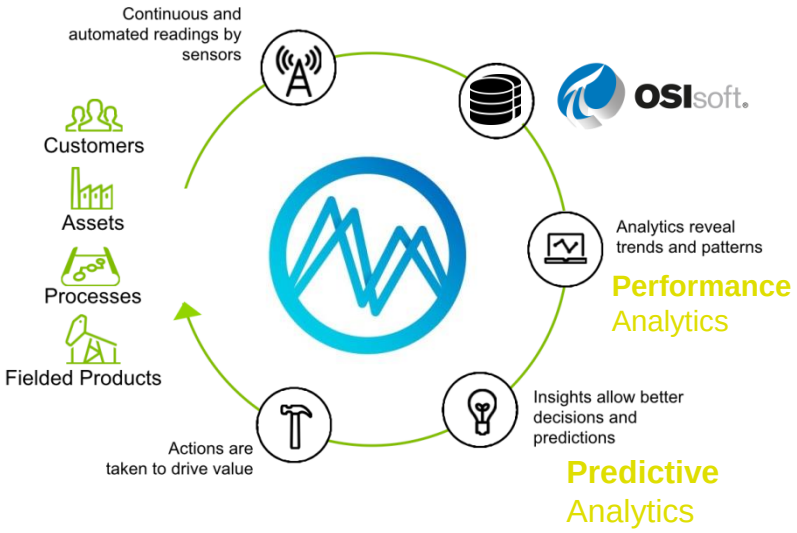
Within TOTAL Refining & Chemicals industrial plants

- Thousands of assets
- Millions of sensors to monitor
- Tons of data to analyze

"We must give the power to the people that can interpret the thousands of data."

© Copyright 2017 OSIsoft, LLC

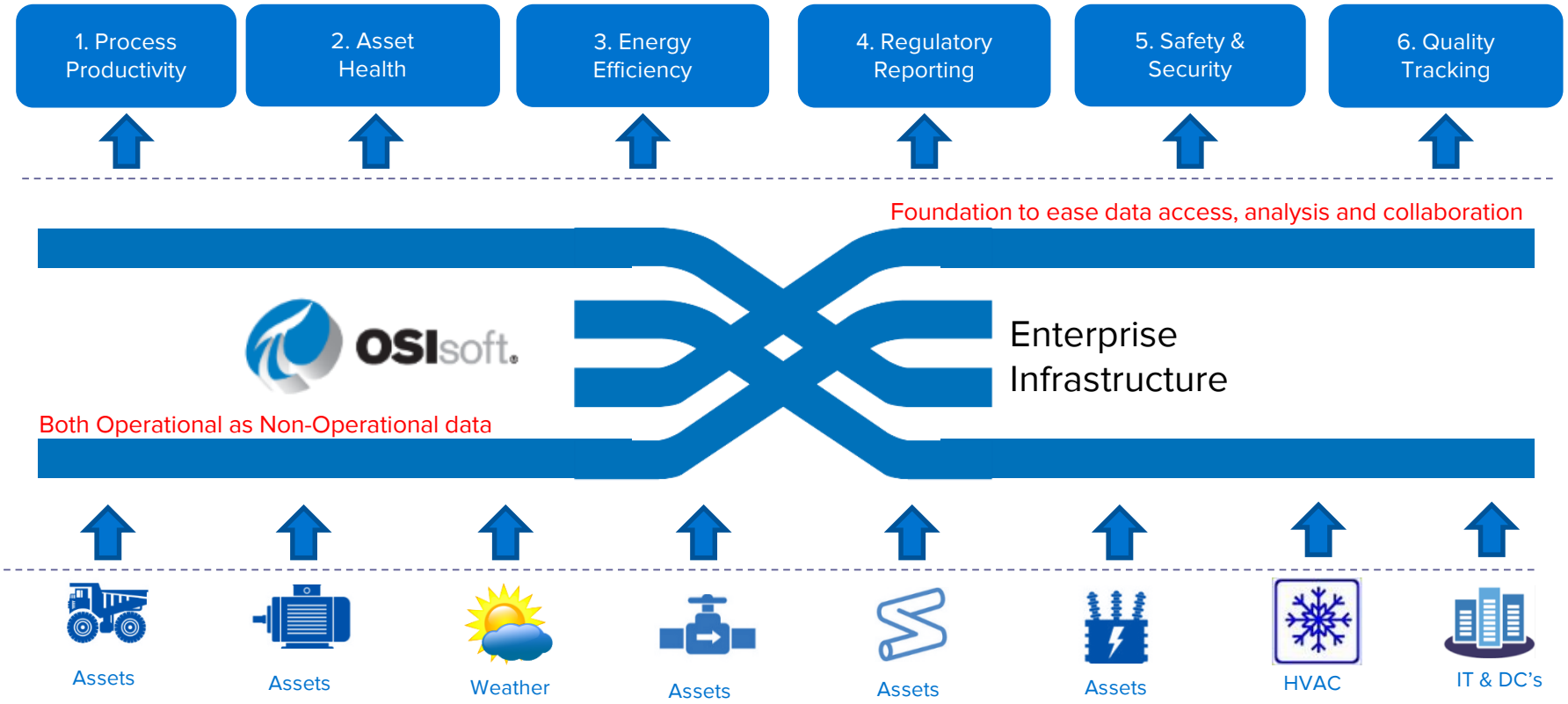
Trendminer Capabilities



Search	High Performance and **multi dimensional search** on process data
Diagnose	Self-Service and **Model free** advanced **diagnostics**
Capture	**Capturing** manual input on process events **with automatic labeling** of bookmarked situations
Monitor	Positive and Negative **monitoring** for both simple and **complex patterns**
Predict	**Predicting** performance **based on historical** similar situations

© Copyright 2017 OSIsoft, LLC

An Infrastructure Connects the Enterprise



© Copyright 2017 OSIsoft, LLC

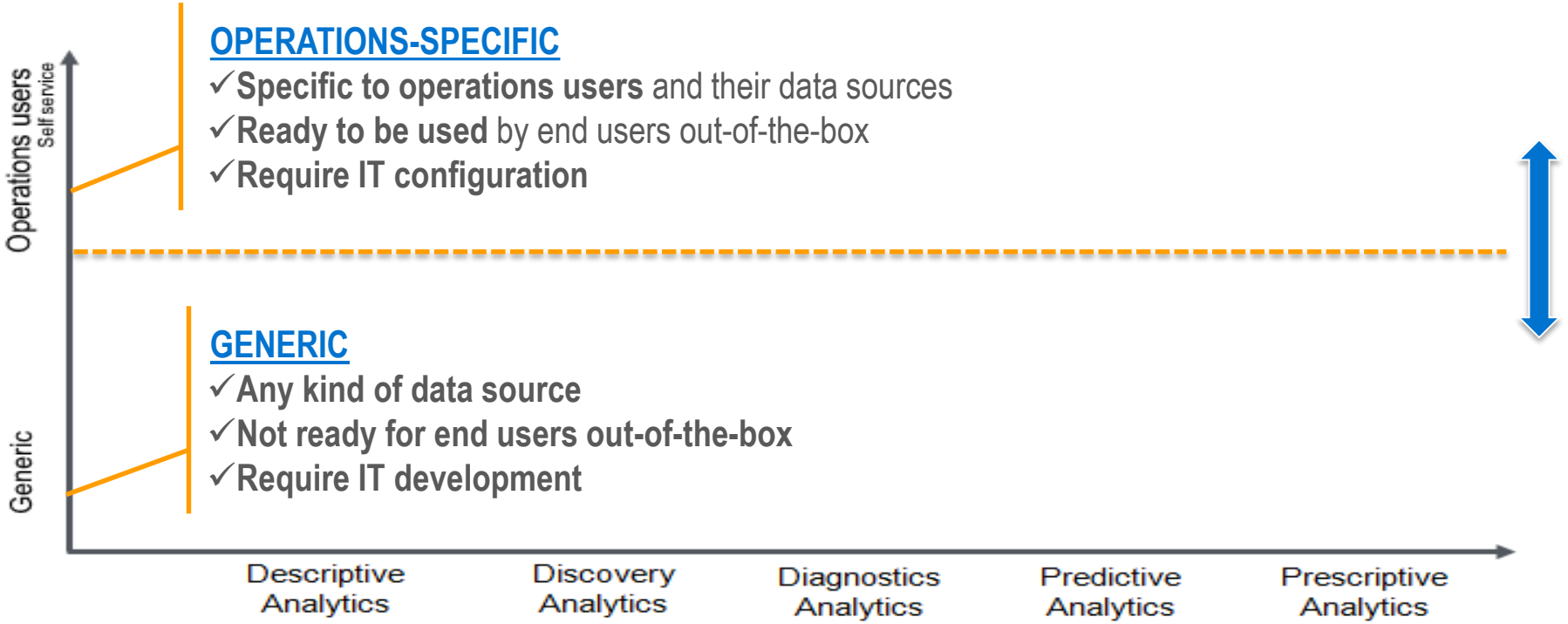
Trendminer's Added Value

Visualization / descriptive	• **Easy** and **user-friendly** trend overlays • **Self service** access to calculations
Search / discovery	• **Extensive real-time search** options on process data.
Diagnostics	• Advanced diagnostics : **influence factors, comparison**
Monitoring and predictive	• **Self-service alerting** options for end users • **Fingerprinting** options • Plug-and-play **predictive mode**
Knowledge sharing	• Auto and manual **annotations** for patterns • Support for communication between engineering and shifts

© Copyright 2017 OSIsoft, LLC

Understanding the Analytics Tools Market in 2017

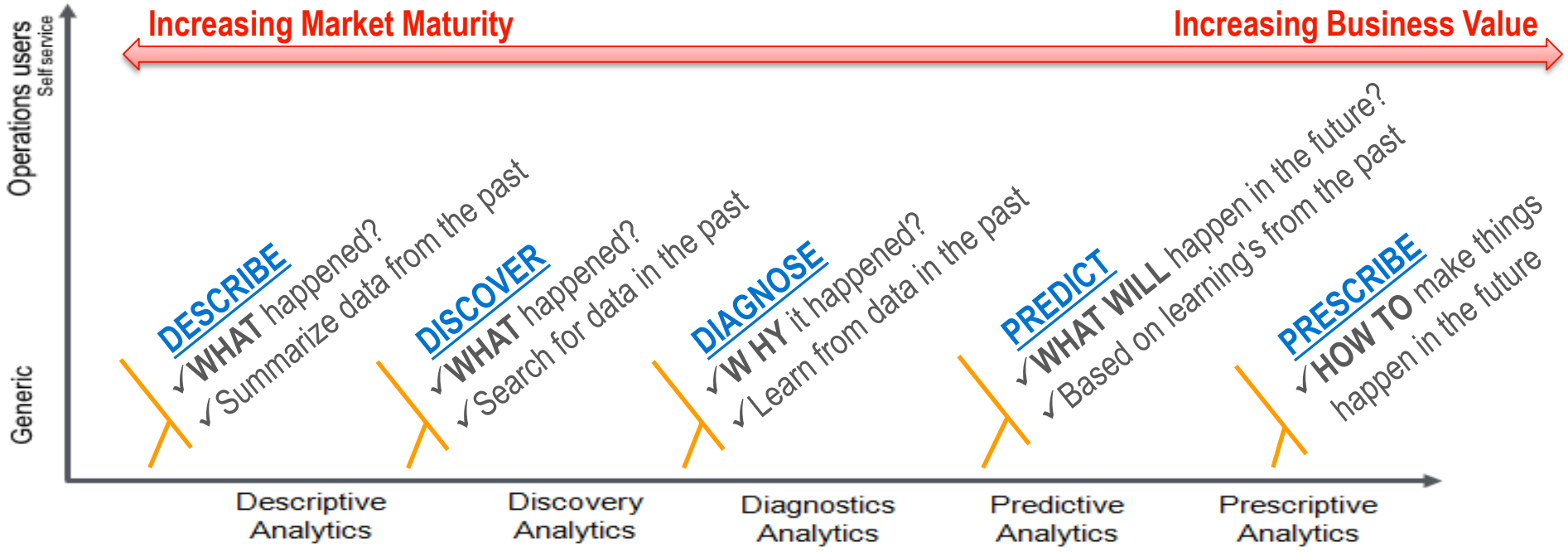
ANALYTICS TOOLS MARKET POSITIONING | *ZOOM ON THE Y-AXIS*



© Copyright 2017 OSIsoft, LLC

Understanding the Analytics Tools Market in 2017

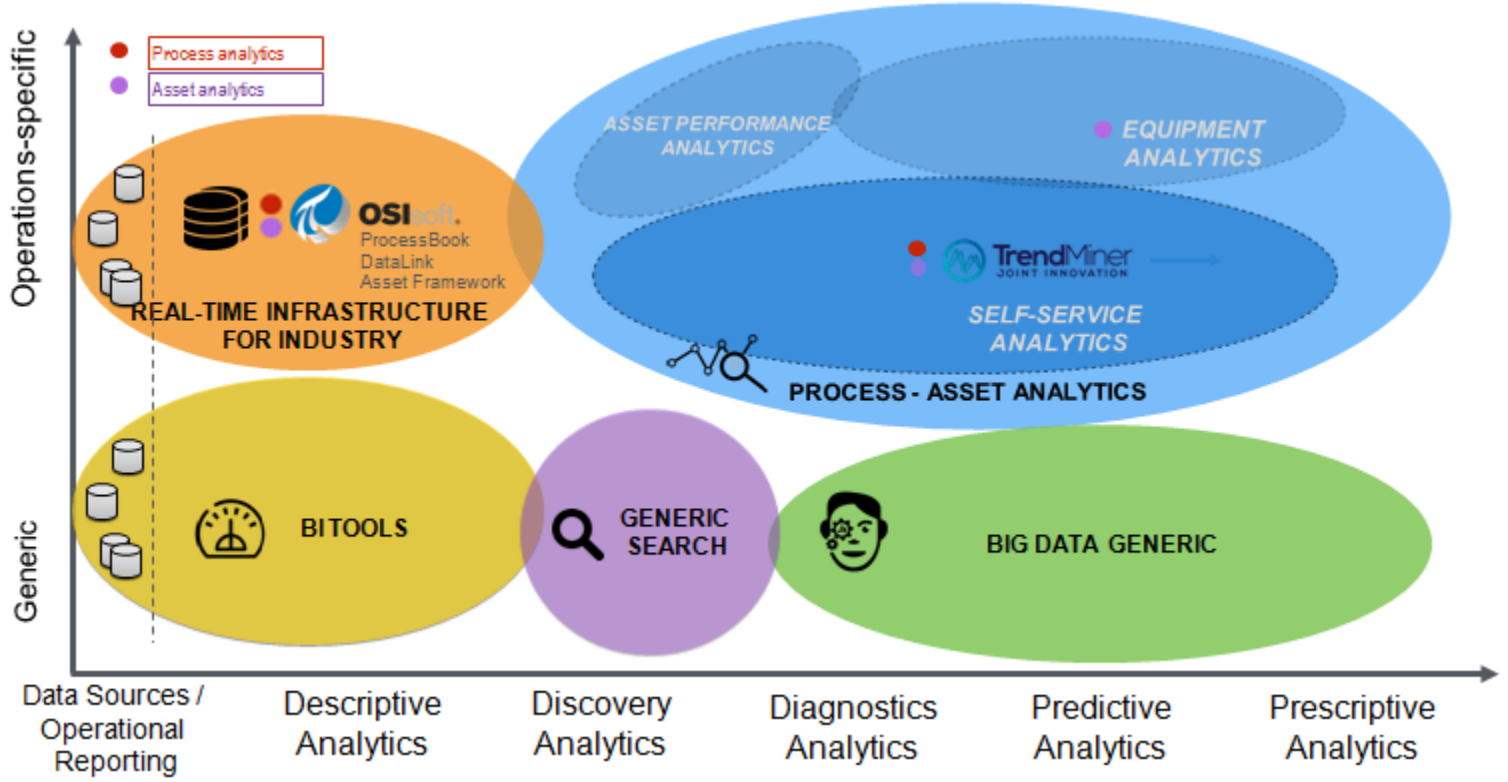
ANALYTICS TOOLS MARKET POSITIONING | *ZOOM ON THE X-AXIS*



© Copyright 2017 OSIsoft, LLC

The Analytics Tools Vision at Total RC in 2017

OVERVIEW OF ANALYTICS TOOLS BY MARKET POSITION



© Copyright 2017 OSIsoft, LLC

Zoom on Industrial Analytics Tools at Total RC

	Real-Time Infrastructure for Industry	Predictive Maintenance	Discovery & data analytics
Supplier	OSIsoft.	Adv. Monitoring Systems	TrendMiner JOINT INNOVATION
Target users	Non-data scientists, either on site or not	Subject matter experts	Subject matter experts / data scientists
Use	▪ **Describe & Discover** functionalities but at a **basic level** ▪ **Potential increase** of use cases by implementing **PI AF**	▪ Can **not** be implemented **without PI** ▪ **Benchmark** of the different tools **on-going**	▪ Can **not** be implemented **without PI** data but **totally new functionality**

These 3 families are neither actual nor potential competitors and are compatible with each other!

© Copyright 2017 OSIsoft, LLC



RETURN ON EXPERIENCE OF RC PILOT USERS

TRENDMINER TOOL DISCOVERY AND EXAMPLES FROM TOTAL RC USERS

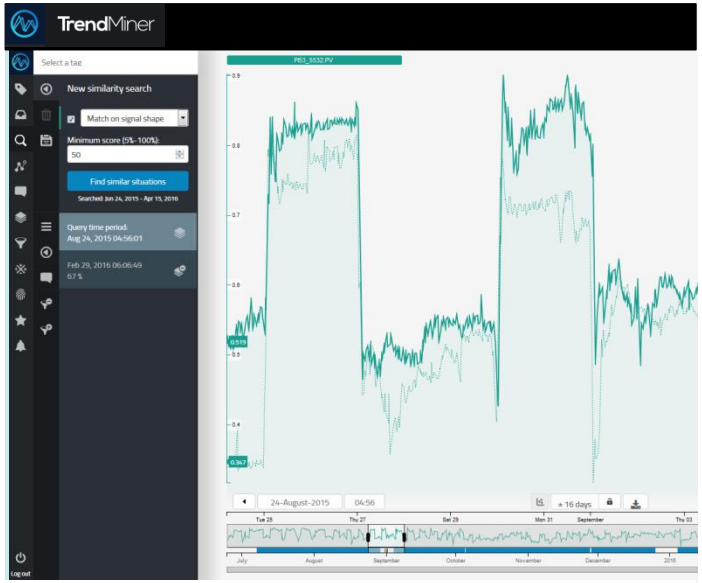
© Copyright 2017 OSIsoft, LLC

PI Data: Discovery & Analytics with Trendminer

Did it happen before ?

"Filtering out irrelevant time series directly on the tool"
"Find easily production transitions and comparable situations"
"Share knowledge to every one directly on the tool"

Similarity Search
(abs value/ signal shape)



"Tremendous time savings thanks to trend search & filtering capabilities"

think digital

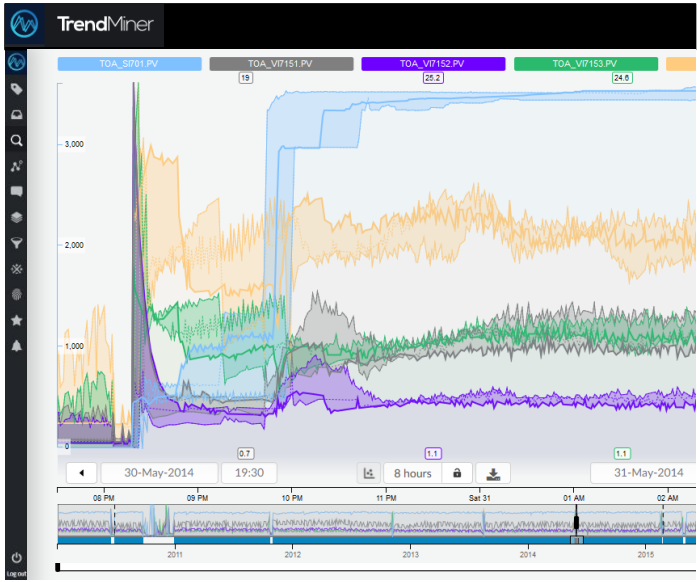
© Copyright 2017 OSIsoft, LLC

Operating Windows with Trendminer

What is normal operation ?

"define an operating window"
"real-time monitoring"
"easy comparison of batch production typically for different polymer grades"
"trigger your own alarm notifications and receive email "

Pattern Fingerprinting



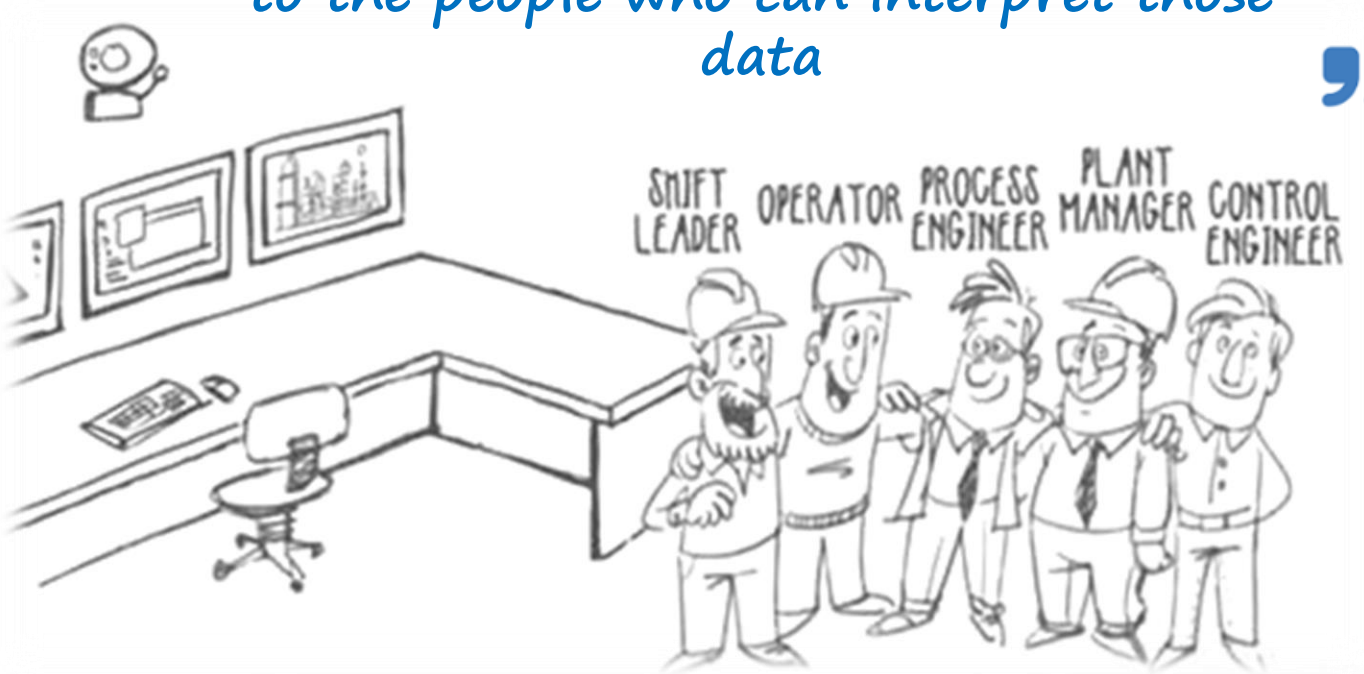
"Arrive sooner at a diagnosis, be beneficial to the interactions between the local and central teams."

think digital

© Copyright 2017 OSIsoft, LLC

Self-Service Analytics

Giving the power of the data to the people who can interpret those data



PILOT @ TOTAL

±45

system matter experts involved

87%

average score on user-friendliness

© Copyright 2017 OSIsoft, LLC

Functional Evaluation by Pilot Users

FUNCTIONALITY ASSESSMENT

HOW WOULD YOU QUALIFY THE VALUE POTENTIAL OF TRENDMINER?

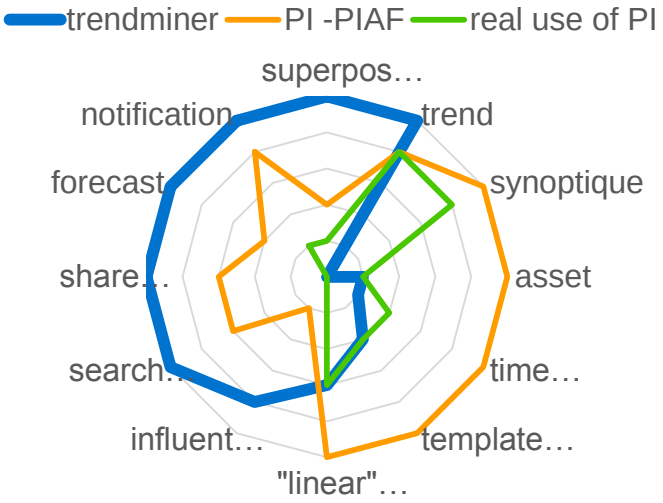
VALUE POTENTIAL

57,9% of respondents:
*"I see **significant value** potential (time gain, $ and / or strategic)"*

42,1% of respondents:
*"I see **some value** potential (time gain, $ and / or strategic)"*

AVERAGE SCORE

Weighted average score: 81%

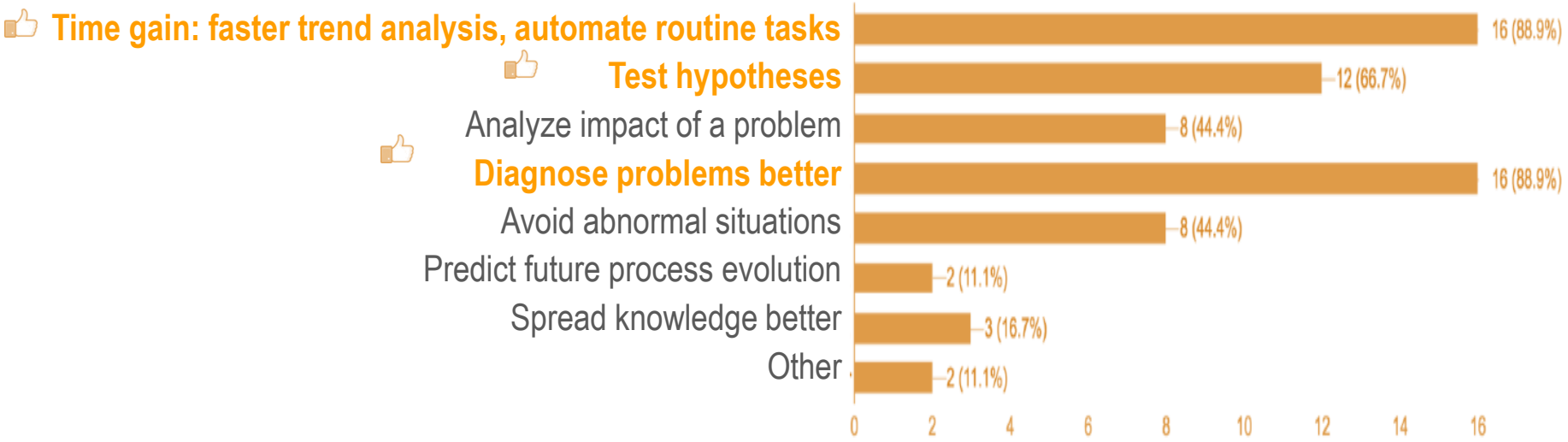


© Copyright 2017 OSIsoft, LLC

Trendminer Benefits Identified @ Total RC

TOOL BENEFITS

WHAT ARE THE MAIN POTENTIAL BENEFITS YOU SEE IN USING TRENDMINER?



© Copyright 2017 OSIsoft, LLC

Conclusion

EXECUTIVE SUMMARY

	Google	OSIsoft		
Functional REX (pilot users)	**Niche positioning** as the 'GOOGLE of the Industry'	Global partner of **OSIsoft PI**	**70** man years R&D behind + **patented tech**	**87%** average score for **user-friendliness**
IT Security & Integration (Arch.)	1 centrally managed **plug & play tool**	**Compatible** with TOTAL IS landscape	**Digital pass** requirements covered	**Agile** development & roadmap in line with Total's
Roll-Out Strategy	**Gradual deployment** for full RC scope (2017 – 2018)	**Roll-out planning** to be defined according to site constraints	**Change mngt project** (not a classical IT-project)	**Yearly follow-up** to evaluate usage and contract commitment (1+1+1 formula)

© Copyright 2017 OSIsoft, LLC

Self-service process analytics at Total Refining & Chemicals improves overall equipment effectiveness

COMPANY and GOAL

Total R&C is constantly looking for ways to **improve overall equipment effectiveness** of the production sites.



CHALLENGE

Give the power to the people that can interpret the thousands of data.

SOLUTION

Run an advanced analytics pilot project on a plant

- Data infrastructure from OSIsoft
- Asset analytics from TRENDMINER

RESULTS

TrendMiner has been added to the catalog of digital solutions which contribute to 'Data-Driven Asset Performance'

Roll out in 9 months

© Copyright 2017 OSIsoft, LLC

Customer Value of OEM Partnership with OSIsoft

Leverage OSIsoft's Key Capabilities

- **Extended use of real-time data infrastructure**
  - Connect any source
  - Reliable real-time data processing and storage
- **Deep integration for PI Asset Framework**
  - Out-of-the-box cross asset search and monitoring
  - TrendMiner Analytics on PI Asset attributes and formulas
- **Bidirectional integration for PI Event Frames**
  - Available for search and diagnostics
  - Process knowledge base: event frames based on search and complex monitoring patterns

Benefits for Customers

- **General**
  - Widen the range of use cases for self service predictive analytics
  - Enable organization to solve more cases (unsolved problems)
  - Increase collaboration and knowledge sharing
- **Safety**
  - Improved regulatory compliance (Safety, Health & Environment)
- **Availability (Overall Equipment Effectiveness)**
  - Extend asset lifetime / time to maintenance
  - Avoid abnormal situations and unplanned maintenance
  - Diagnose bottlenecks
- **Cost control**
  - Increase employee efficiency
  - Reduce operations costs, maintenance costs, waste, etc.
- **Energy efficiency**
  - Reduce utility costs (WAGES; water, air, gas, electricity, steam)

© Copyright 2017 OSIsoft, LLC

Contact Information

Fabrice Leclercq

Fabrice.leclercq@total.com

Rotating Machinery Engineer
TOTAL Refining & Chemicals



Learn more about TrendMiner at Booth #9

OEM partner and Independent Software Vendor

© Copyright 2017 OSIsoft, LLC

Questions

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



State your **name & company**

Please remember to…

Complete the Online Survey for this session



http://bit.ly/uc2017-app

© Copyright 2017 OSIsoft, LLC

감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado

© Copyright 2017 OSIsoft, LLC