



vCampus **Live! 2011**

PI AF + PI Event Frames + Ekho = Real Time Operational Intelligence

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iT*i*

WHERE PI GEEKS MEET



Agenda

- iTi Introduction
- Ekho System and Features
- Market and Customers
- PI AF / PI Event Frames / Ekho Architecture
- Data Access Challenges
- What is next?
- Ekho Demonstration



iTi Introduction

- Founded in 2000 by Patrick Ramsey and Yannick Galipeau
- Headquarters and R&D center located in Montreal, Canada
- Developer of the Ekho System
- Ekho presence in Canada, United-States and Europe
- Working with OSIsoft since the beginning of iTi
- Early Adopter of OSIsoft technologies (PI AF, PI Event Frames)



What is Ekho?

Ekho is an Event Driven, EMI Software (*Enterprise Manufacturing Intelligence*)

- Packaged Cases
- Chemical Reactor Batch
- Steel Coil
- Raw Material Lot #
- Reel of Paper
- Equipment Downtime
- Order
- Complaint
- Wind Turbine Fault
- Environmental Spill
- Process Centerline Event
- Quality upset
- KPI (OEE)
- Injury
- Recipe
-



Ekho System Features

- Production Tracking, Genealogy and Traceability
- Process Centerlining
- Quality and Specifications Management
- Downtime / Rate Loss Captures and Management
- Performance Mgmt. Calculations (OEE & KPI's)
- Accident and Injury Tracking
- Ad Hoc Extractions and Data Analysis
- Web Reporting & Silverlight Web Dashboards





ArcelorMittal



alternativenergy



Rothmans Inc.



Why using PI AF and PI Event Frames

- Faster Development for our applications
- Generic re-usable routines development
- Allows iTi to focus on added values features on top of OSIsoft Infrastructure
- Complete the Integration of Ekho with OSIsoft Infrastructure (PI Server, PI AF, PI Event Frames)
- Allows OSIsoft Clients Applications to use Ekho Data



Benefits of PI AF and PI Event Frames for Ekho

- **PI AF and PI Event Frames Templates**
- **Templates inheritance**
- **PI AF Attributes**
- **UOM**



\\ITWKS00\E2 - PI System Explorer

File Edit View Go Tools Help

Database Query Date Back Check In Refresh New Element New Attribute Search

Elements

- My Solar
 - Europe
 - Spain
 - Castilla La Mancha
 - Castilla y Leon
 - North America
 - US
 - California
 - Fed Ex CA
 - Solar 466
 - Solar 469
 - PVC CA
 - Solar 472**
 - Wal-Mart CA
 - Solar 476
 - Solar 479
 - Solar 482
 - Solar 485
 - Solar 488
 - Solar 491
 - Solar 494
 - Solar 498
 - Solar 501
 - Solar 504
 - Solar 507
 - Solar 510
 - Solar 512
 - Solar 515
 - Solar 518
 - Solar 521
 - Solar 523

Elements
Event Frames
Library
Unit of Measure

Solar 472

General Child Elements Attributes Ports Version

Filter

Name	Value
ContractType	PPA
Latitude	36° 12' 5.22" N
Longitude	119° 20' 59.77" W
Peak Capacity	1176 kW

Group by: ☐ Category ☐ Template

Name: Longitude

Description:

Configuration Item: ☐

Categories:

Default UOM: <None>

Value Type: String

Value: 119° 20' 59.77" W

Data Reference: <None>

Settings...

Solar 472 Modified:11/25/2011 9:15:22 AM. Version: 1/1/1970 12:00:00 AM, Revision 2



Added value of iTi to PI AF and PI Event Frames

- Bring into a Single Solution Information from PI AF, PI Event Frames, PI Server and Ekho
- Quality Specifications and Limits
- Multi Language
- Hierarchical Data Structures (Products, Downtime Reason Tree, etc.)



http://itsql2008/e2r2/ EKHO Look II

Definition Security User Management Display language: English US ...

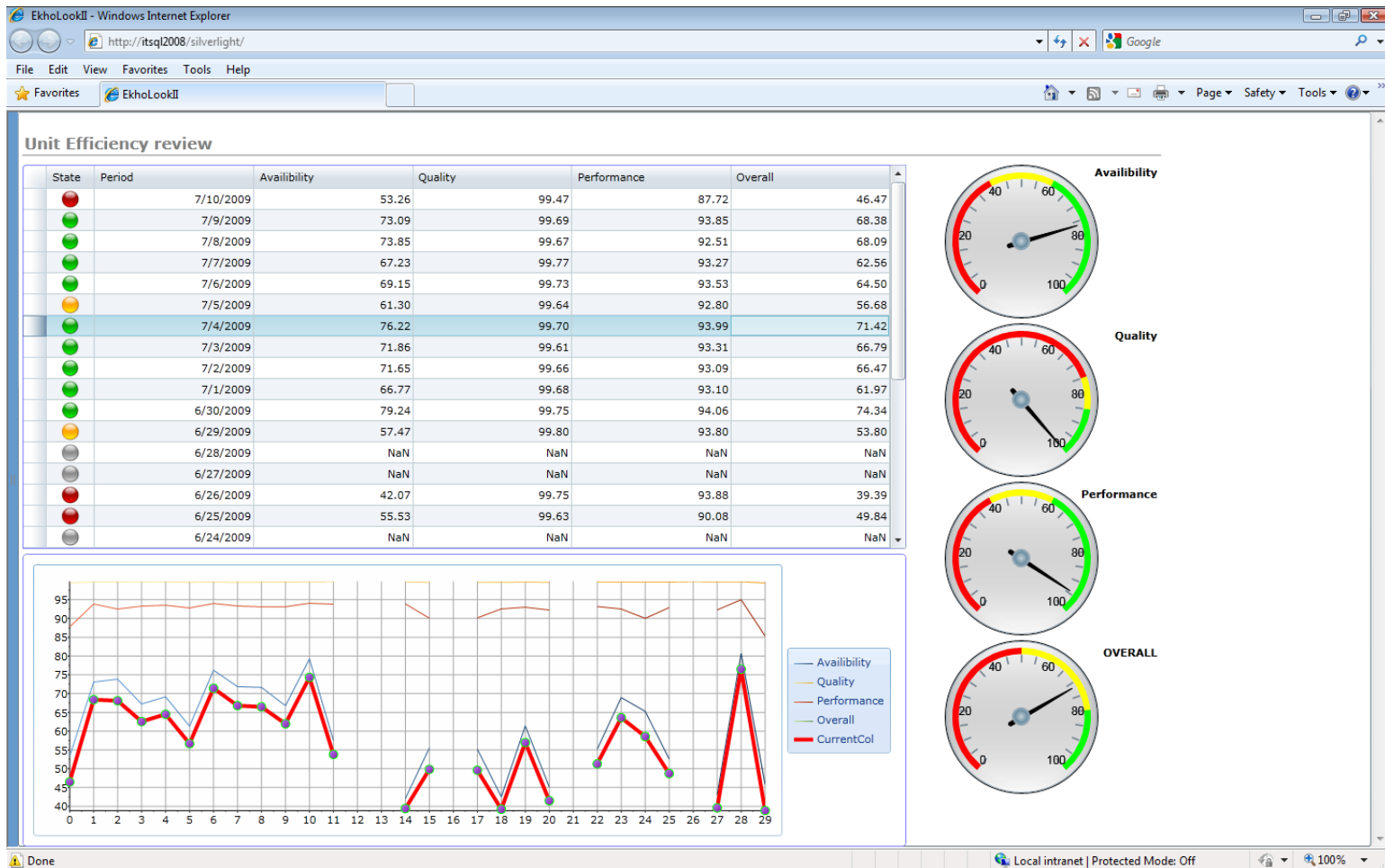
Save Refresh Delete Move...

Attribute
Marker
Event Template
Derates
Downtime
EditAuditLog
EnergySettlement
KPI-Day
KPI-Month
KPI-Quarter
KPI-Shift
KPI-Week
KPI-Year
NercOutage
NercPerformance
OilSample
Operation
Performance
Reel
Running
Sector Template
Site Hierarchy
Style Configuration
Style Definition

Event Template Attribute

Checked	Effective	Name	Text	Description
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	EnergySettlement	EnergySettlement	Energy Settlement
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	KPI-Month	KPI-Month	KPI-Month
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Derate's	Derates	Derate
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	NercPerformance	NercPerformance	Nerc Monthly Perf
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	NercOutage	NercOutage	Nerc Monthly Outage
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	KPI-Quarter	KPI-Quarter	KPI-Quarter
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	KPI-Day	KPI-Day	KPI-Day
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	KPI-Week	KPI-Week	KPI-Week
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	KPI-Year	KPI-Year	KPI-Year
<input type="checkbox"/>	<input type="checkbox"/>	Downtime	Downtime	Downtime
<input type="checkbox"/>	<input type="checkbox"/>	Running	Running	Running
<input type="checkbox"/>	<input type="checkbox"/>	Operation	Operation	Operation
<input type="checkbox"/>	<input type="checkbox"/>	KPI-Shift	KPI-Shift	KPI-Shift
<input type="checkbox"/>	<input type="checkbox"/>	Performance	Performance	Performance
<input type="checkbox"/>	<input type="checkbox"/>	EditAuditLog	EditAuditLog	Edit Audit Log
<input type="checkbox"/>	<input type="checkbox"/>	OilSample	OilSample	OilSample
<input type="checkbox"/>	<input type="checkbox"/>	Reel	Reel	





http://itwks00/ekhoiweb2/ EKHO Look II EKHO Look II

Loss Events Editor

Sector: POLI-R2101C

By Date
Relative

Start Date: 8/1/2011 12:00:00 AM
End Date: 11/25/2011 11:59:59 PM

86 events displayed

Drag a column here to group by that column

Validated	Event Start	Event End	Reason Code
✓	8/6/2011 4:57:43 PM	8/6/2011 8:28:31 PM	N/A
✓	8/6/2011 1:40:09 PM	8/6/2011 4:57:43 PM	N/A
✗	8/6/2011 9:55:43 AM	8/6/2011 1:40:09 PM	Speed
✗	8/6/2011 5:51:36 AM	8/6/2011 9:55:43 AM	Down
✗	8/6/2011 1:43:41 AM	8/6/2011 5:51:36 AM	Speed
✗	8/3/2011 3:20:27 PM	8/6/2011 1:43:41 AM	Down
✗	8/3/2011 3:20:27 PM	8/6/2011 1:43:41 AM	Down
✗	8/3/2011 11:29:54 AM	8/3/2011 3:20:27 PM	Speed
✗	8/3/2011 7:12:12 AM	8/3/2011 11:29:54 AM	Down
✗	8/3/2011 3:28:43 AM	8/3/2011 7:12:12 AM	Speed
✗	8/2/2011 9:07:42 AM	8/3/2011 3:28:43 AM	Down
✗	8/2/2011 9:07:42 AM	8/3/2011 3:28:43 AM	Down
✗	8/2/2011 2:52:47 AM	8/2/2011 9:07:42 AM	Down
✓	8/1/2011 10:09:02 PM	8/2/2011 2:52:47 AM	N/A
✗	8/1/2011 5:47:55 PM	8/1/2011 10:09:02 PM	Down
✓	8/1/2011 2:11:13 PM	8/1/2011 5:47:55 PM	N/A
✓	8/1/2011 9:05:14 AM	8/1/2011 2:11:13 PM	N/A
✗	8/1/2011 3:04:03 AM	8/1/2011 9:05:14 AM	Downtime

Event Editor - Reason Code Selection

Selected Event

Start Time	End Time	Level 1	Level 2	Level 3	Level 4	Duration
8/3/2011 2:25 AM	8/3/2011 3:28 AM	Downtime	Planned	Changeover / HP	No Level 4	63

Select a Reason Code from the Tree and click Apply button

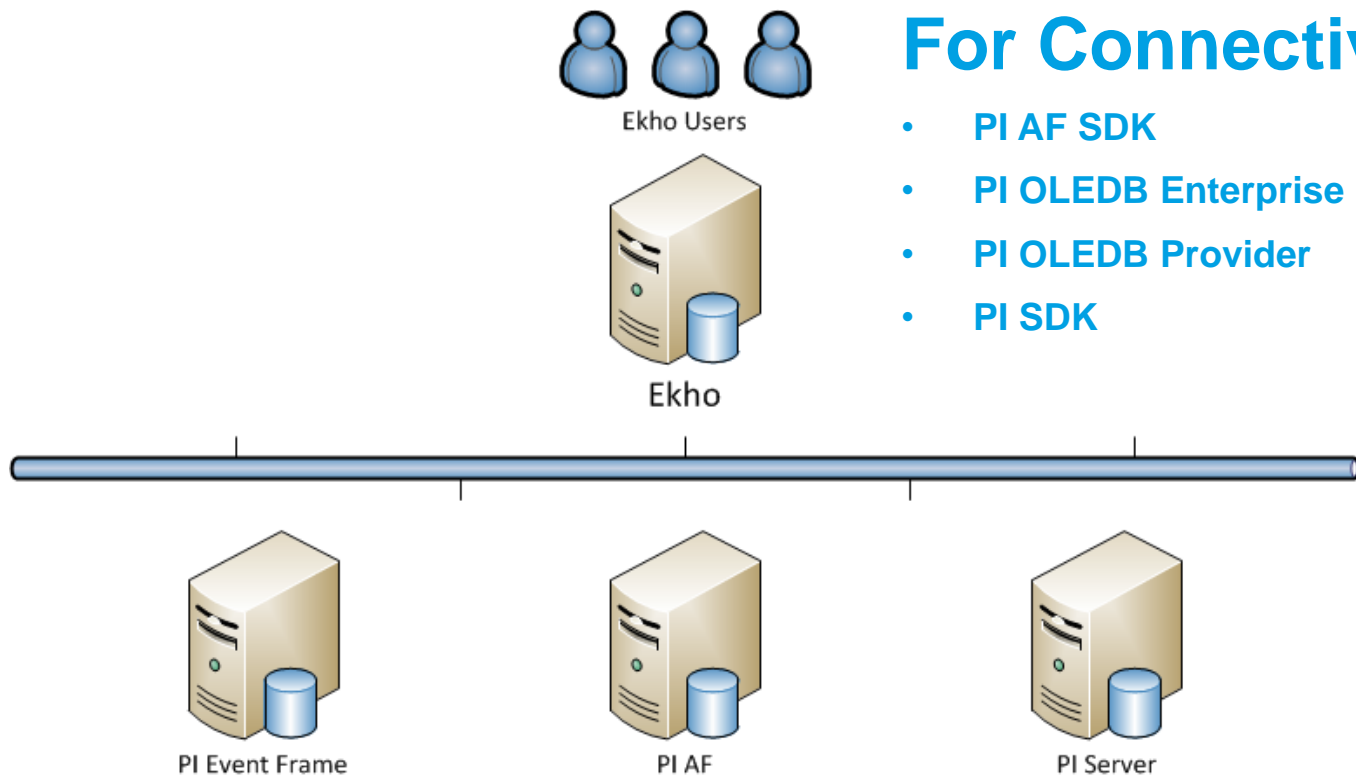
- Speed Loss
 - Batch Restarted
- Minor Stops
 - Blockage
 - Carro fwd
 - Gasometro
- Downtime
 - Planned
 - Changeover / HP
 - Cleaning
 - Maintenance
 - Elettrical
 - Meccanical
 - Strumental
 - No business request
 - Storage full
 - Waiting analysis
- Unplanned
 - Acetone
- Failure
 - HP Cleaning
- Operator

Apply Code Cancel

Select Reason Code Comment Split Event

Comment: Tenuta meccanica
Non capisco la durata calcolata da EKHO e la scelta di downtime....

System Architecture



For Connectivity:

- PI AF SDK
- PI OLEDB Enterprise
- PI OLEDB Provider
- PI SDK

PI AF and PI Event Frame Data Access Challenges

- All the Data for the Ekho Frontend needs to come from SQL Server
- Initial Data Access available through SDK only
- Usage of SQL CRL with Web Services for reads and writes to PI AF and PI Event Frames
- Web Services Overhead



Next Steps

- Migration all the Readings from PI AF to the usage of the PI OLEDB Enterprise (in progress).
- Waiting for the PI Event Frame OLEDB Access to migrate Web Services Calls for Reads.
- Writes to PI AF and PI Event Frames will still be through the SQL CLR and Web Services.
- When Writing is available through OLEDB, Web Services will be Removed as well for Saving Data.



iti Presentation

Welcome



System Overview Detail Data

29 Sites



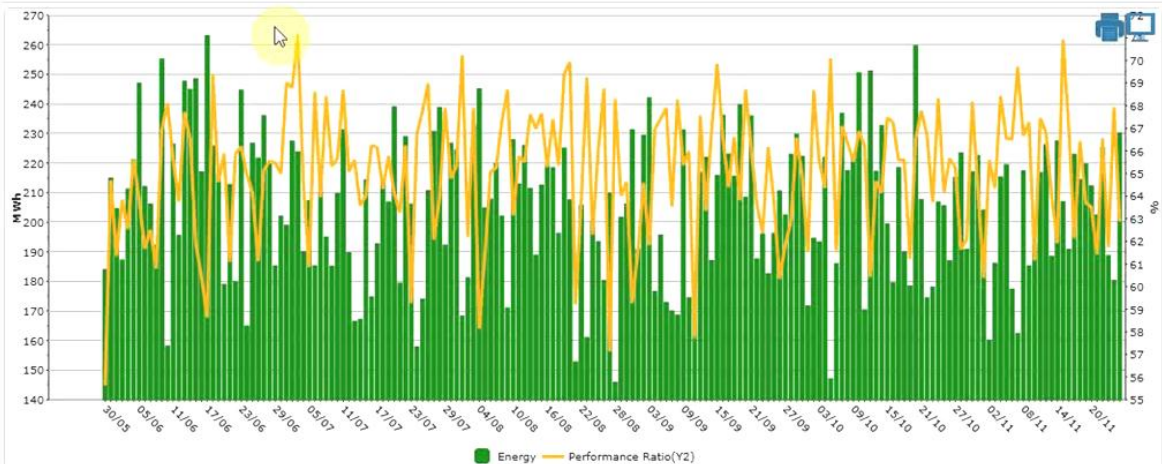
Operational

	Yesterday	Month To Date	Year To Date
Energy	220.73 MWh	2,947.20 MWh	18,361.50 MWh
Availability	54.02 %	94.50 %	95.43 %
Performance Ratio	62.15 %	68.36 %	73.57 %
Insolation vs Expected	94.47 %	95.33 %	94.92 %



Environmental

	Yesterday	Month To Date	Year To Date
Trees Planted	3,100,922 trees	14,375,295 trees	92,460,853 trees
Plane Flights	128 flights	2,684 flights	12,513 flights
CO2 Saved	6,831	196,589	844,413



Actual MWh vs Performance Ratio

1D 1M 3M 6M 9M 12M Custom



Messages

Info	Site	Date	Description
⚠	Solar 560	10/14/2011 10:36:01	this is the body text
⚠	My Solar	10/03/2011 21:53:27	Global BP Solar Customer Message
🔧	My Solar	10/04/2011 21:14:36	Planned Maintenance Scheduled
⚠	My Solar	09/22/2011 08:43:19	UnPlanned schedule in progress
📍	California	10/14/2011 10:36:01	this is the body text



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iTi



Thank you

