Overall equipment effectiveness in the PI System Ecosystem
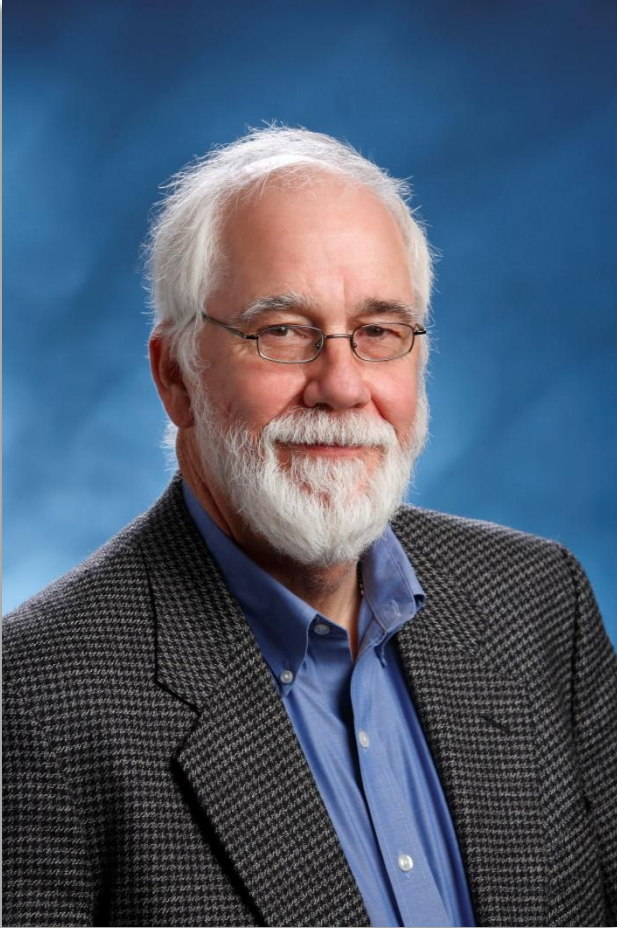
Presented by **Dean MacLean, PEI Energy Systems**

Keith Flynn, RtTech Software Inc.

Mission

"Our mission is to maximize the Value our customers get from our product and services"
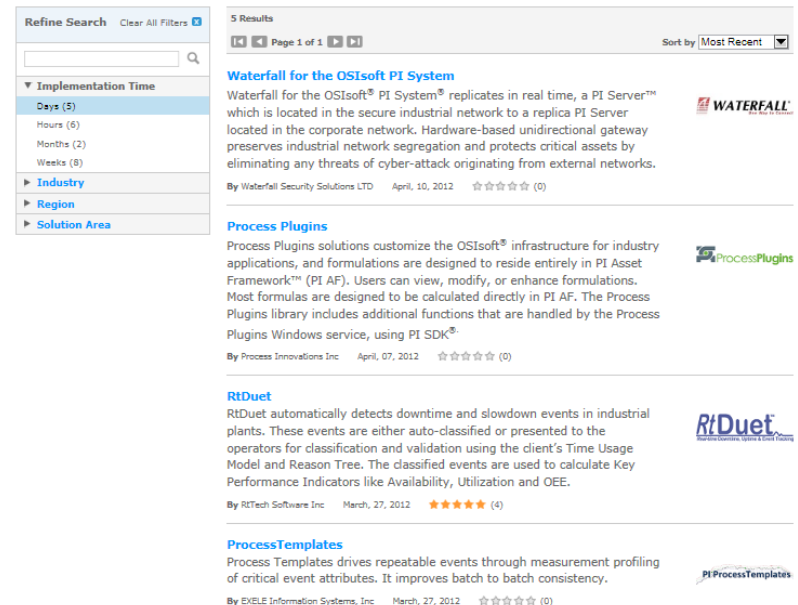
OSIsoft® Partner Solution Showcase

– Find software solutions from OSIsoft partners with specific industry and domain expertise.

– http://partners.osisoft.com/solutions

pss@osisoft.com

Presenters

- Dean MacLean
  - PEI Energy Systems
  - Charlottetown PEI
  - dmaclean@peies.ca
- Keith Flynn
  - RtTech Software Inc.
  - Moncton NB
  - keith@RtTechSoftware.com
- Stephane Rioux
  - OSIsoft
  - Montreal, QC
  - srioux@osisoft.com

PEI Energy

OSIsoft. Empowering Business in Real-time.

Veresen PEI - The System
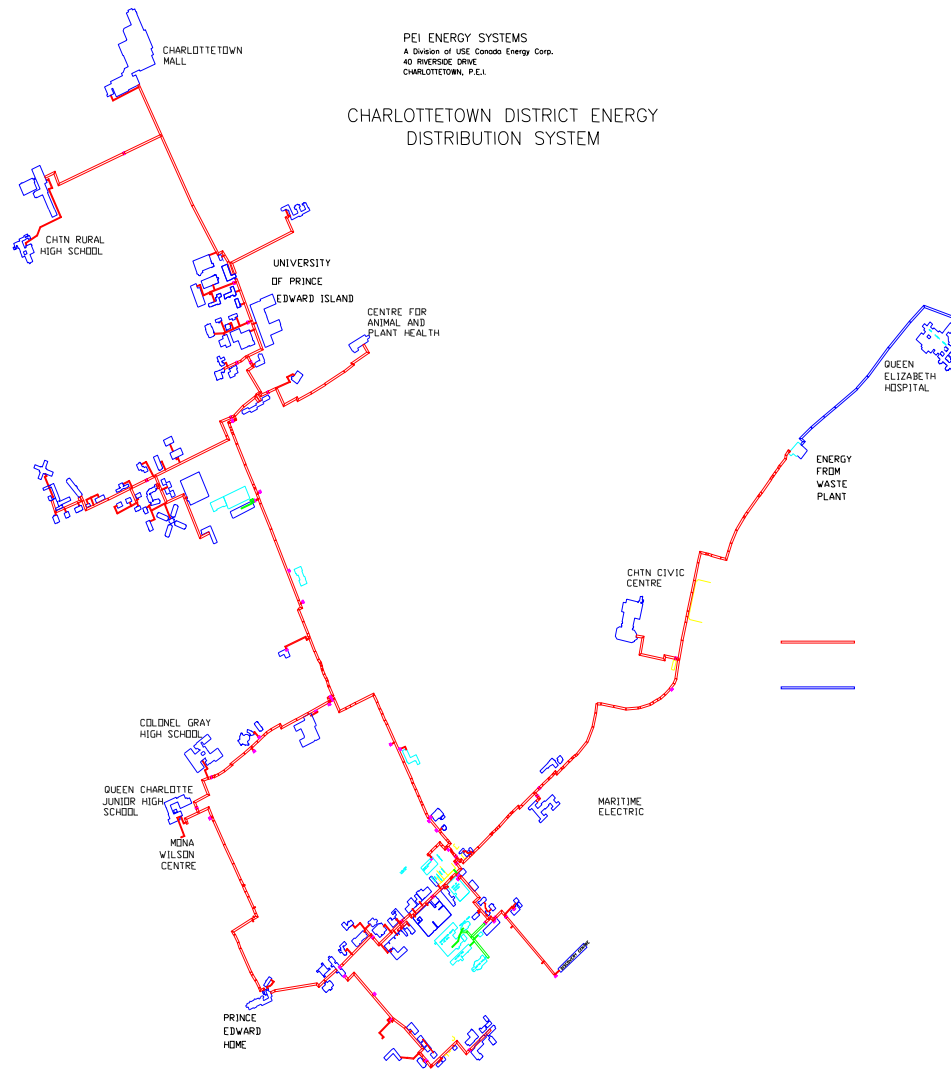
Annual Fuel Consumption

Fuel Usage by Type

■ Waste ■ Wood ■ Oil

	2007	2008	2009	2010
Oil	19%	18%	20%	16%
Wood	46%	47%	46%	47%
Waste	36%	34%	34%	37%
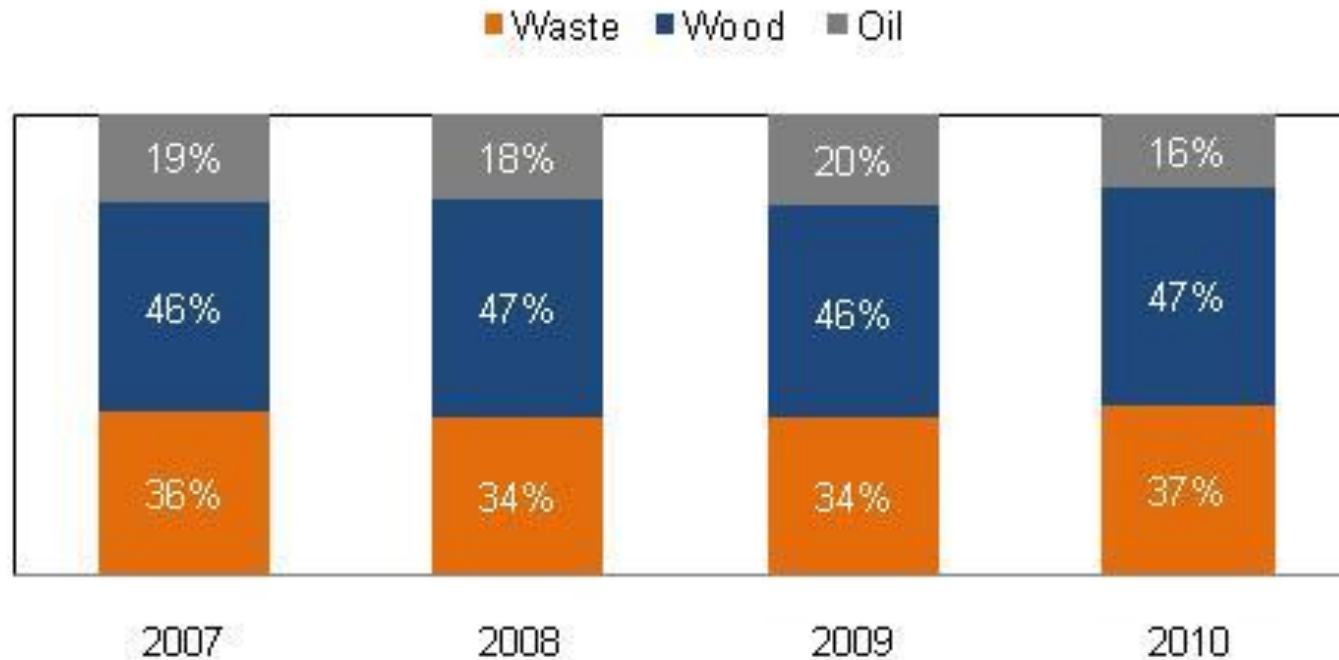
Fuel Flexibility

Charlottetown District Energy System

- System peak load ~ 40 MW – Equivalent to 4000 single family homes

- Cogeneration of electricity (1200 KW on peak)
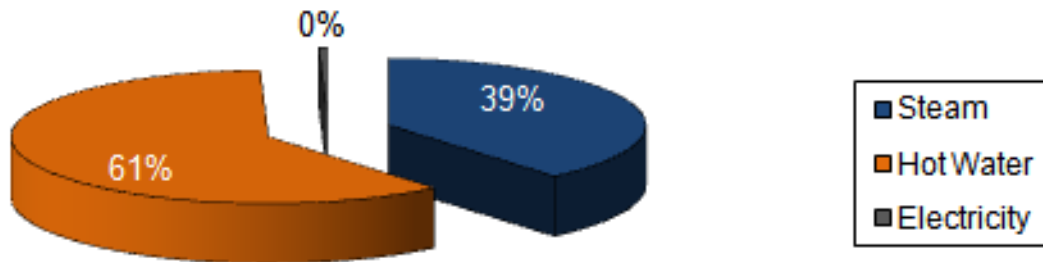 - 4800 MWh produced primarily for the displacement of purchased electricity
  - 600 MWh exported to the grid annually Equivalent to ~ 80 single family homes

Total Energy Sales 132,000 MWh

0%

39%

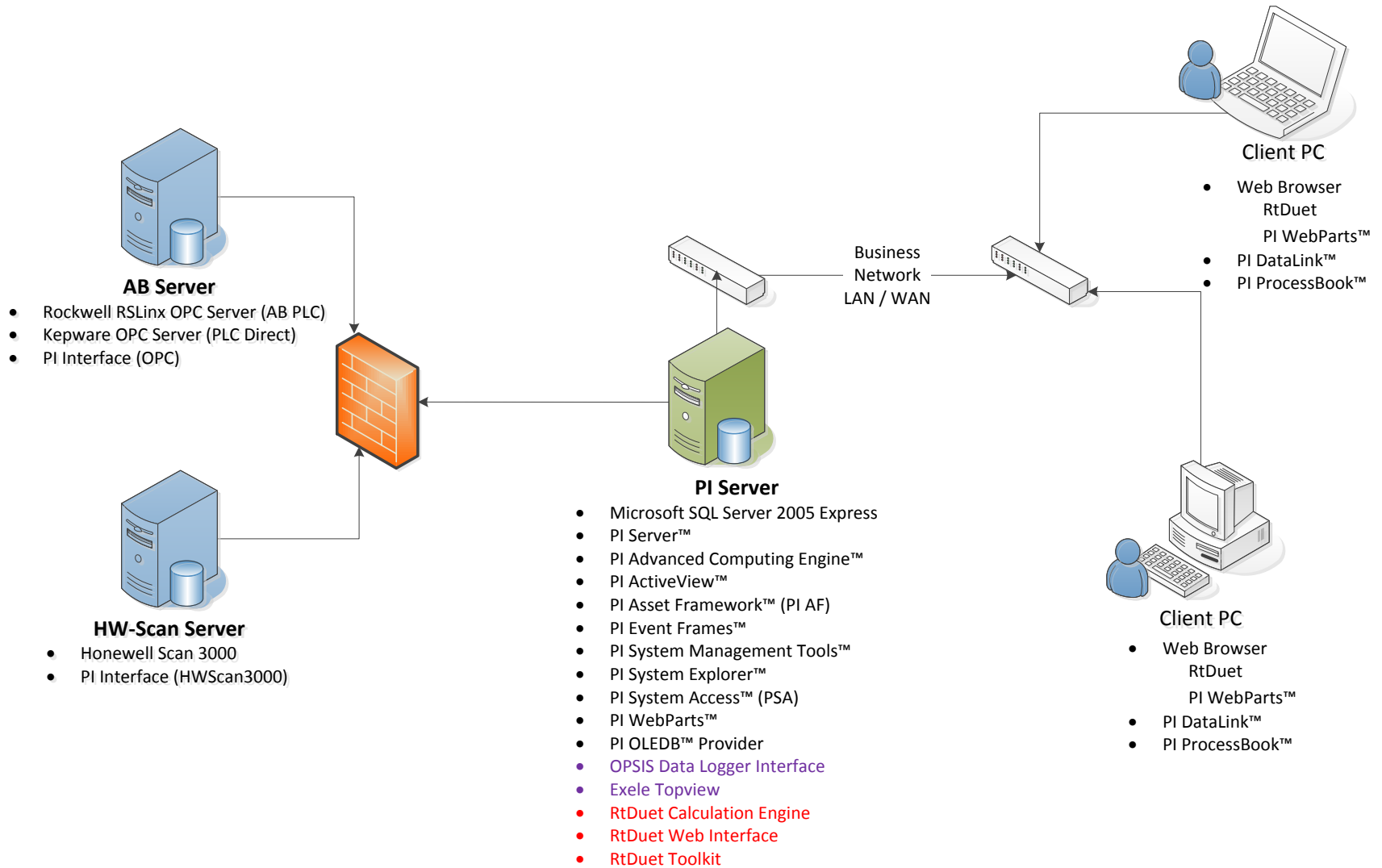61%

- Steam
- Hot Water
- Electricity

Our Situation

- No good up to date data for reporting Environmental Events
- Data was always old and hard to retrieve

- SCADA Honeywell Scan 3000
    - Data was always a month old
        - Saved everything to excel
        - Had to purge frequently
        - High requirement for manual data mining

- Updated controls to AB Control Logix and Rockwell RSView SE
    - Upgrades did not solve issues with data

- Needed a data historian for easy access to the data
- Needed a tool for analyzing environmental events

Our Solution

- Selected OSIsoft PI System™ and RtDuet ™ (Installed 2009)

- Data Sources
  - Honeywell Scan 3000
    - PI HW3000 Interface
  - AB Control Logix PLCs
    - Rockwell RSLinx OPC Server
    - PI OPC Interface
  - PLC Direct
    - Kepware OPC Server
    - PI OPC Interface
  - OPSIS Data Logger
    - PI SDK Custom Interface

- RtDuet 2012 for PI AF
  - RtDuet Calculation Engine
  - RtDuet Toolkit
  - RtDuet Web Interface
  - RtDuet Data Server

- PI Server™
- PI Advanced Computing Engine™
- PI ActiveView™
- PI Asset Framework™ (PI AF)
- PI DataLink™
- PI Event Frames™
- PI ProcessBook™
- PI System Management Tools™
- PI System Explorer™
- PI System Access™ (PSA)
- PI WebParts™
- PI OLEDB™ Provider

- Exele Topview

AB Server
- Rockwell RSLinx OPC Server (AB PLC)
- Kepware OPC Server (PLC Direct)
- PI Interface (OPC)

HW-Scan Server
- Honewell Scan 3000
- PI Interface (HWScan3000)

Business
Network
LAN / WAN

PI Server
- Microsoft SQL Server 2005 Express
- PI Server™
- PI Advanced Computing Engine™
- PI ActiveView™
- PI Asset Framework™ (PI AF)
- PI Event Frames™
- PI System Management Tools™
- PI System Explorer™
- PI System Access™ (PSA)
- PI WebParts™
- PI OLEDB™ Provider
- OPSIS Data Logger Interface
- Exele Topview
- RtDuet Calculation Engine
- RtDuet Web Interface
- RtDuet Toolkit

Client PC
- Web Browser
  RtDuet
  PI WebParts™
- PI DataLink™
- PI ProcessBook™

Client PC
- Web Browser
  RtDuet
  PI WebParts™
- PI DataLink™
- PI ProcessBook™

Now – Our Solution

	(2009) **Then (Hrs)**	(2012) **Now (Hrs)**	**Annual** **Savings Estimate**
Annual Man Hours Saved from Reporting	192	12	$ 27,000.00
Annual Operator Hours Saved	183	61	$ 18,250.00
Data is now more accurate			
Data is now on time			
'EFW.INCIN.1.Secondary.temp.avg'<990			
Start	1-Sep-09	1-Sep-12	
End	1-Oct-09	1-Oct-12	
Hours	145.7	6.2	
% Reduction		95.8%	

Savings Estimate $45,250.00

PEI Energy – PI System Demo

RtTech Software Inc.
RtDuet

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About **RtTech** Software Inc.

- Founded in November 2011 by ADM Systems Engineering Ltd. Software Group

- Head Office in Moncton, NB, Canada

- Resources in Canada, USA, Europe, Australia

- Developer of 2 products:
  - RtDuet: 6 year old product with 35+ installations worldwide.
  - RtEMIS: 2 year old product with 5 installations in North America.

- Mission: Development, Marketing and Sales of best in class products to turn Data into Actionable Information.

Why Manage Downtime

- Increased plant efficiency and performance
- Improved safety
- Extended asset life cycle
- Availability is a key maintenance and reliability metric
- Reduced Unplanned Maintenance
- Reduced maintenance costs
- Improved product quality
- Greater visibility of asset performance
- Working smarter rather than harder

Downtime in Operations

- Plant Stoppages
    - Unplanned maintenance (breakdowns)
    - Scheduled maintenance
    - Operational delays (blockages, shift change)
    - Non-scheduled time
    - Idle (Energy supply, feed supply, stock-bound)
- Plant Slowdowns
    - Aging equipment
    - Poor quality feed
    - Bottlenecks

Typical scenarios

- Paper log sheets / Excel based solution
  - Inaccurate information
  - Time consuming
  - Sheets are lost
  - Comments can not be analysed or quantified
- Downtime collation time consuming
- Uncontrolled information
- Home grown reporting systems are expensive to develop and maintain.

RtDuet – Rich History

1st Generation
Stand Alone Application
PI Tags for outputs and comments
Excel Reports

2nd Generation
PI ACE
Recalculation
Excel Reports

3rd Generation
Logic Tables
Annotations
New interface
Improved reporting

4th Generation
PI Batch
Web Interface
Configuration Toolkit
Web Service
SAP Integration

5th Generation
PI AF
Event Frames
Calculation Engine

| 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |

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About RtDuet

Downtime and OEE
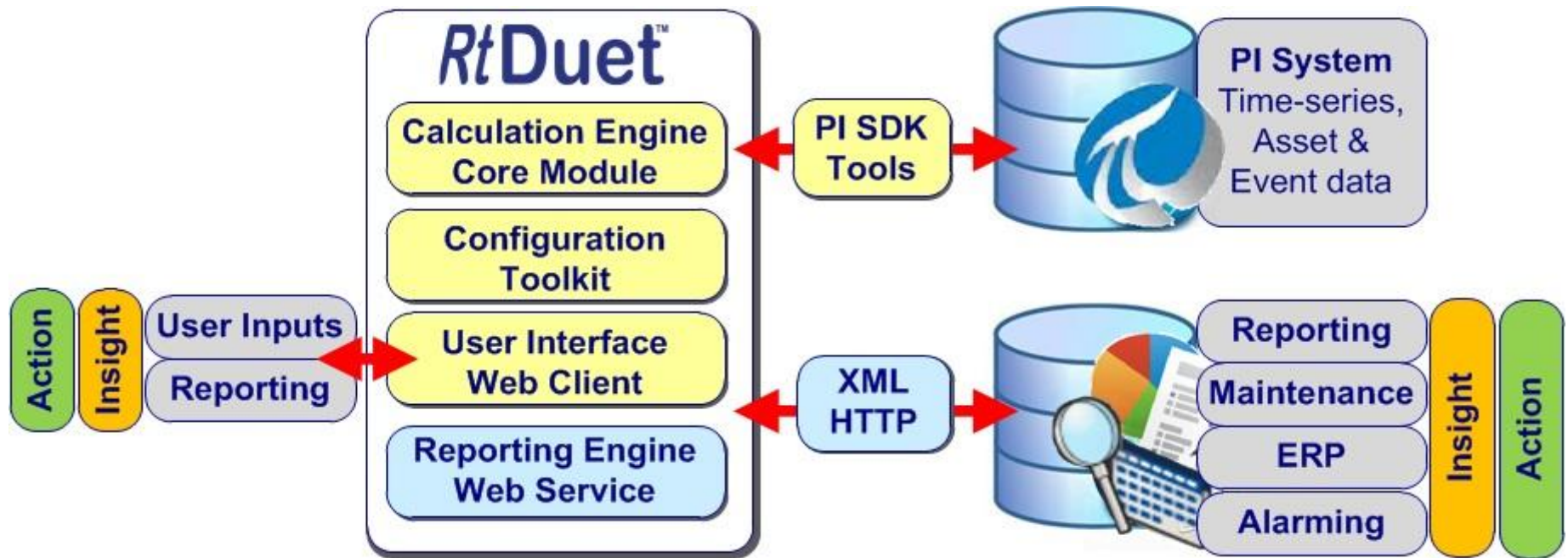
RtDuet - Downtime

- Automatically generates operational performance information

RtDuet - Downtime

- Exposes business logic using a configuration environment driven by templates

RtDuet - Downtime

- Delivers Information
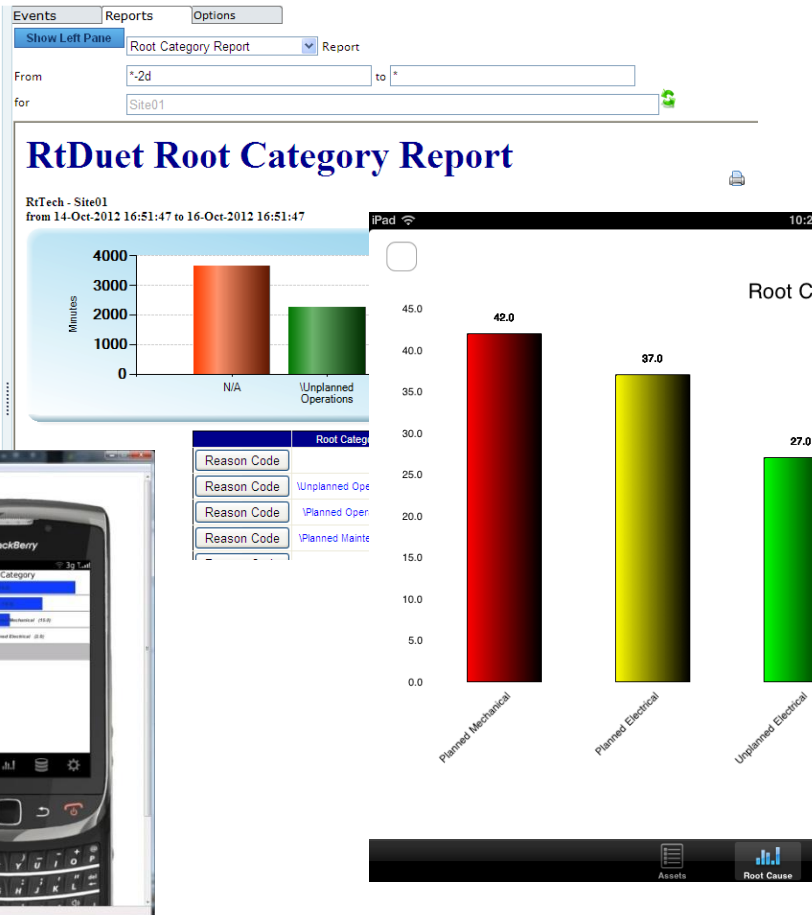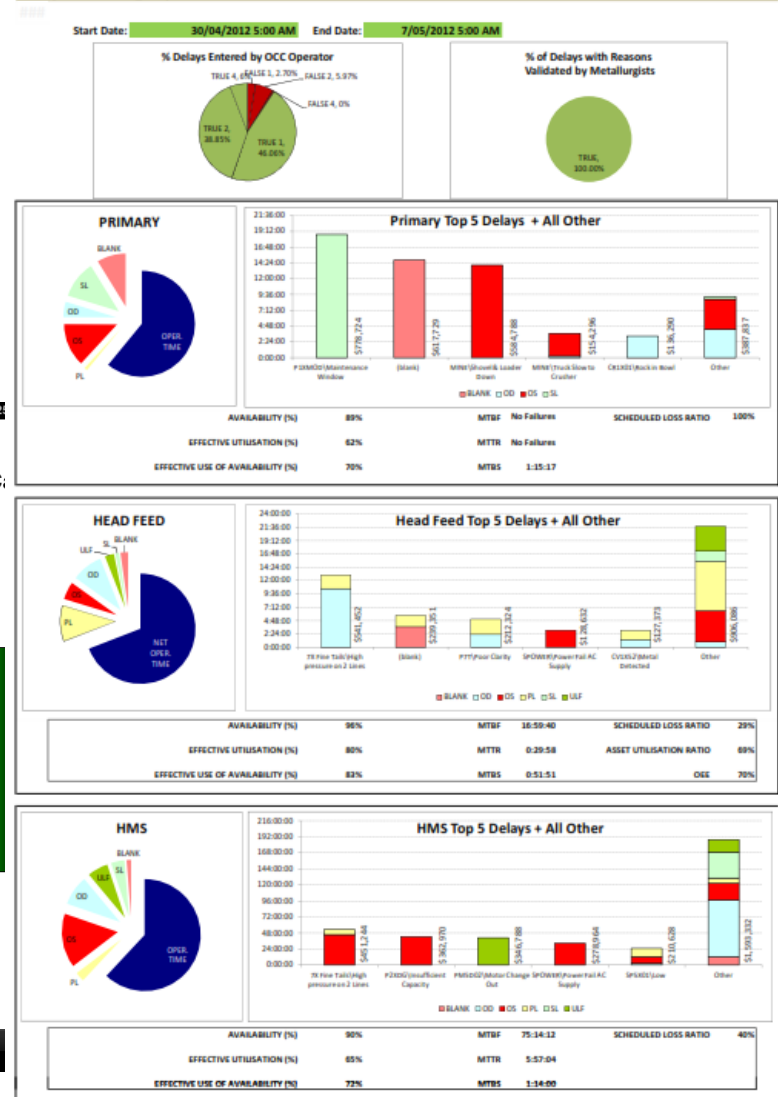
About RtDuet - OEE

- Overall Equipment Effectiveness (OEE) is an Asset Performance KPI

- Some companies have designed their own slightly different version of OEE.

- RtDuet can be configured to meet all the OEE definitions

- OEE breaks the performance of a manufacturing unit into:
  - Availability
  - Performance
  - Quality

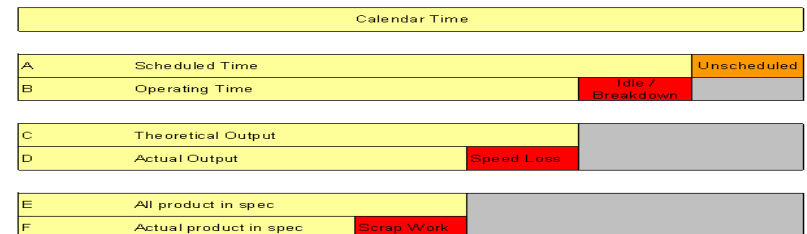|	Calendar Time		
A	Scheduled Time		Unscheduled
B	Operating Time	Idle / Breakdown	
C	Theoretical Output		
D	Actual Output	Speed Loss	
E	All product in spec		
F	Actual product in spec	Scrap Work	

B/A = Availability   D/C = Performance   F/E = Quality

$$OEE = B/A \times D/C \times F/E$$

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About RtDuet - OEE

- **<u>Availability</u>**:
- Represents the percentage of scheduled time that the operation is available to operate.
- The Availability Metric is a pure measurement of Uptime
- Most manufacturing companies have developed a Time Usage Model that states how Availability is calculated
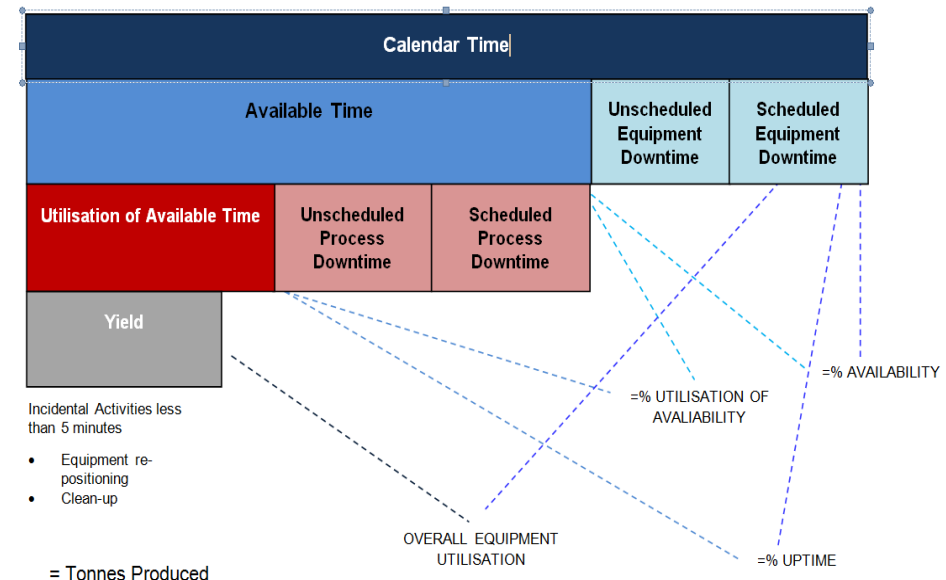
$$Availability = \frac{Calendar\ Time - Scheduled\ Equ.\ Downtime - Unscheduled\ Equ.\ Downtime}{Calendar\ Time}$$

About RtDuet - OEE

About RtDuet - OEE

Performance:

- Represents the speed at which the Work Center runs as a percentage of its designed speed

$$Performance = \frac{Production\ achieved\ when\ running}{Theoretical\ Production}$$

Quality:

- Represents the Good Units produced as a percentage of the Total Units Started

- We can calculate it or access it from other existing systems

About RtDuet - OEE

- RtDuet uses the classified events to calculates real-time Key Performance Indicators (KPI) like:
    - OEE
    - Availability
    - Utilization
    - MTBF
    - MTTR
    - MTBS
    - Effective Utilization
    - Operating Efficiency
    - …
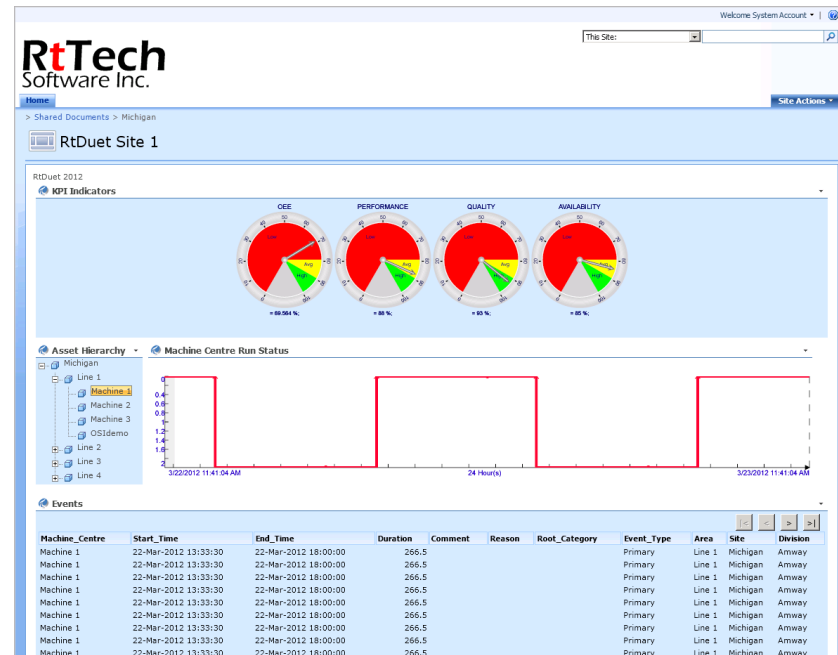
RtDuet Benefits

- Transforms Operational Data into Actionable Information to:
  - Optimize Performance
  - Reduce Downtimes
  - Reduce Operator workload
  - Standardized Information
  - Increase Profits

RtTech Software
RtDuet Demo

OSIsoft.

Questions?

Partner Solution Showcase Webinar Series

Date	Title
September 5, 2012	Migration of DCS/SCADA Graphics to PI ProcessBook (Automatic and Fast)
September 19, 2012	Tag Tuning to Optimize Information Retained in the PI Server
October 3, 2012	One Way PI System Data Transmission from Secure to Business Networks
November 7, 2012	Process Calculations and Characterization embedded in PI Asset Framework
December 5, 2012	KPIs, Data and Events On Any Mobile Device

Webinar Recordings

You can watch previously recorded Partner Solution Showcase Webinars at http://partners.osisoft.com/solutions

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Thank you