

REAL-TIME PERFORMANCE MANAGEMENT FOR THE ENTERPRISE

**RtPM**



REAL-TIME PERFORMANCE MANAGEMENT FOR THE ENTERPRISE

**RtPM**



## **RtPM**

# **A Collaborative Manufacturing Infrastructure Supporting What the Enterprise Must Do, Should Do, and Wants to Do**

**Curt Hertler**

**OSISOFT Cleveland**

## The Bottom Line:

**As business and IT recognize the overlapping requirements of individual compliance mandates, leaders are taking steps to build out a sustainable architecture that minimizes time and cost while maximizing future reuse.**

**John Hagerty, AMR Research Staff**



# “Compliance” Mandates

## Definition: Compliance

*The act of complying with a demand, request, or wish.*

- [www.dictionary.com](http://www.dictionary.com)

Manufacturing enterprises strive to comply with:

- Government Regulations
- Industry Standards
- Best Practices

All require real-time information



# Must do's – Government Regulations

Mandate	Description	Industry
EPA Clean Air Act (1990)	Sets limits on air pollutants.	All
EPA Clean Water Act (1972)	Set limits on water discharged to waterways.	All
EPA Title V	Regulation of chemical substances whose manufacture may present risk to health or the environment	Oil & Gas Chemicals Pulp & Paper
FDA 21 CFR Part 11	Electronic records and signature	Pharmaceutical Food
FDA – GMP	Finished Drugs or Medical Devices	Pharmaceutical
NERC Critical Infrastructure Protection	Cyber security standards	Power Generation Transmission & Distribution



# Should do's – Industry Standards

Standard	Description	Industry
QS 9000	Quality Management	All
ISA-SP95	Enterprise – Control System Integration	All
ISA-SP99	Manufacturing and Control Systems Security	All
ISA-SP88	Batch Control System Standards	Pharmaceutical Chemical
NERC GADS	Generating Availability Data System (GADS)	Power Generation
HACCP	Hazard Analysis and Critical Control Point Principles	Food



# Want to do's – Best Practices

Best Practice	Description	Industry
KPI	Key Performance Indicators	All
CBM	Condition Based Maintenance	All
FDA - PAT	Ensure Final Product Quality	Pharmaceutical
OEE	Overall Equipment Effectiveness	Chemicals Food Metals & Mining
Six Sigma	Continuous Quality Improvement	Metals & Mining



# The RtPM Platform an Infrastructure for Collaborative Manufacturing Compliance

- Real-time Infrastructure Requirements
- Active Compliance Architecture
- RtPM's Role in Supporting this Architecture
- Customer Case Studies



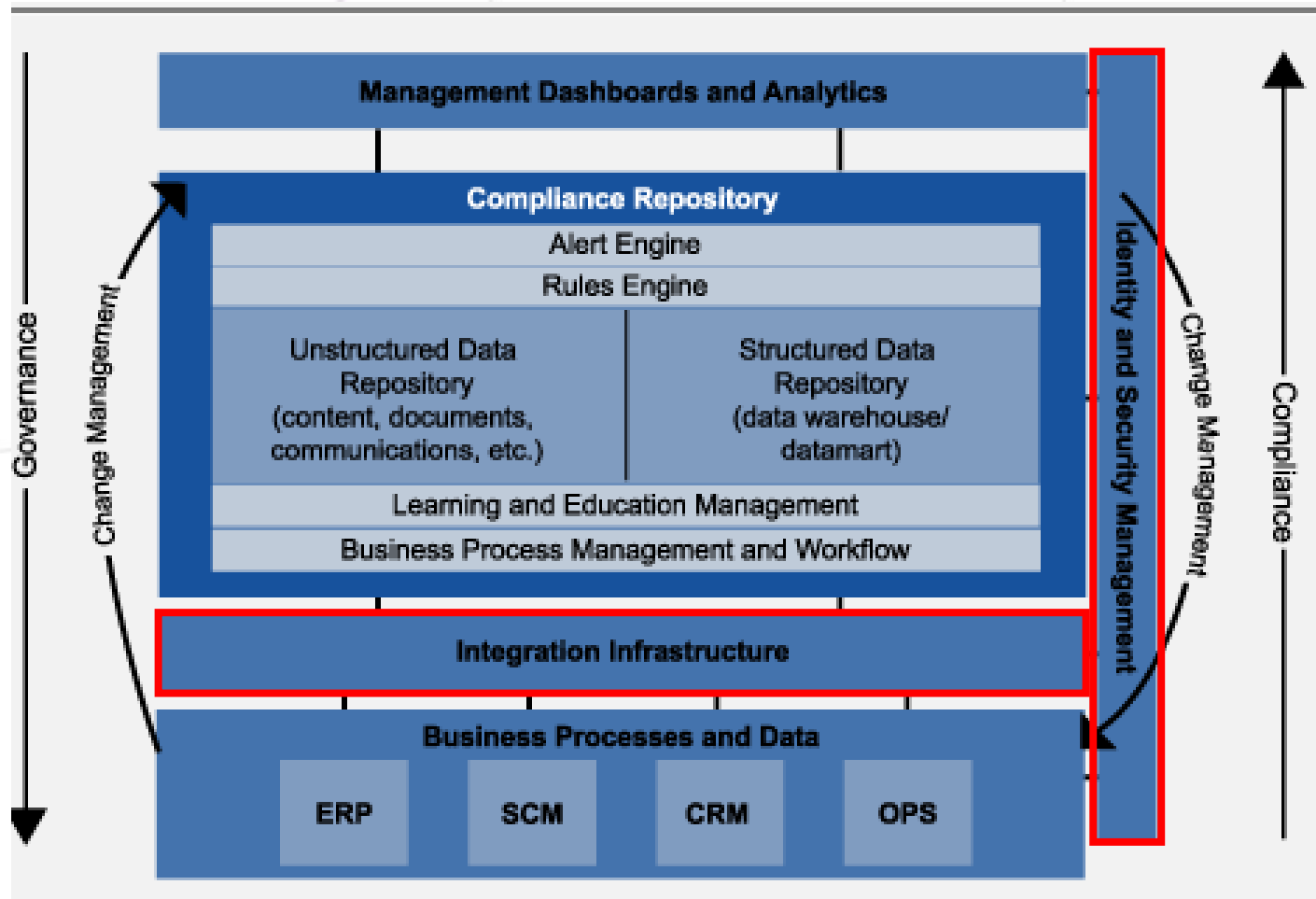


# Real-time Infrastructure Requirements

- Complete Real-Time Data Capture and Access
  - Broad access to manufacturing data
  - High speed, large capacity data handling
  - Data integrity, security, and auditing is fundamental
- Transparent Integration and Data Structure
  - Standards compliant OPC, OLEDB, ODBC
  - Common context to enable efficient reuse and scalability
- Robust Analytical Capabilities
- Version Controlled Reporting and Alert Notification
- Collaborative Environment, to make it go



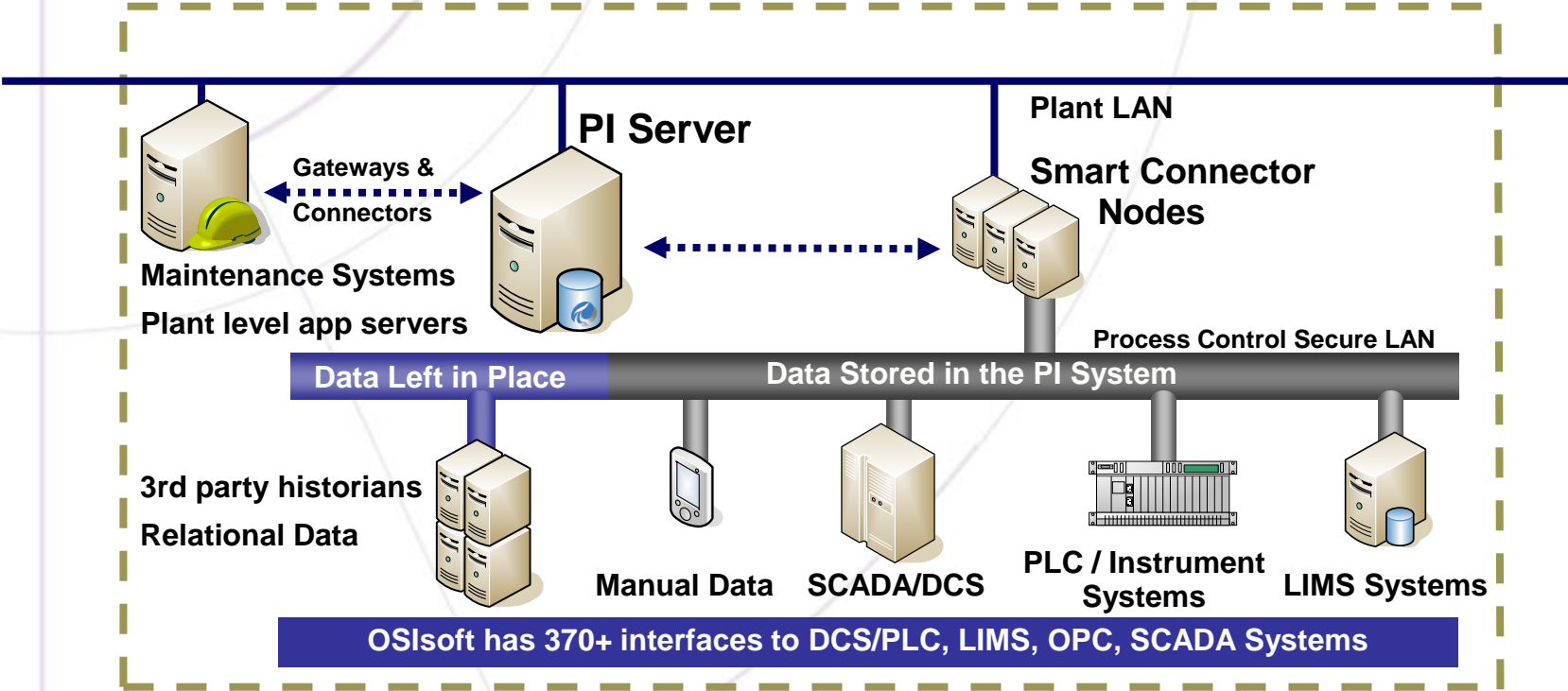
# Active Compliance Architecture



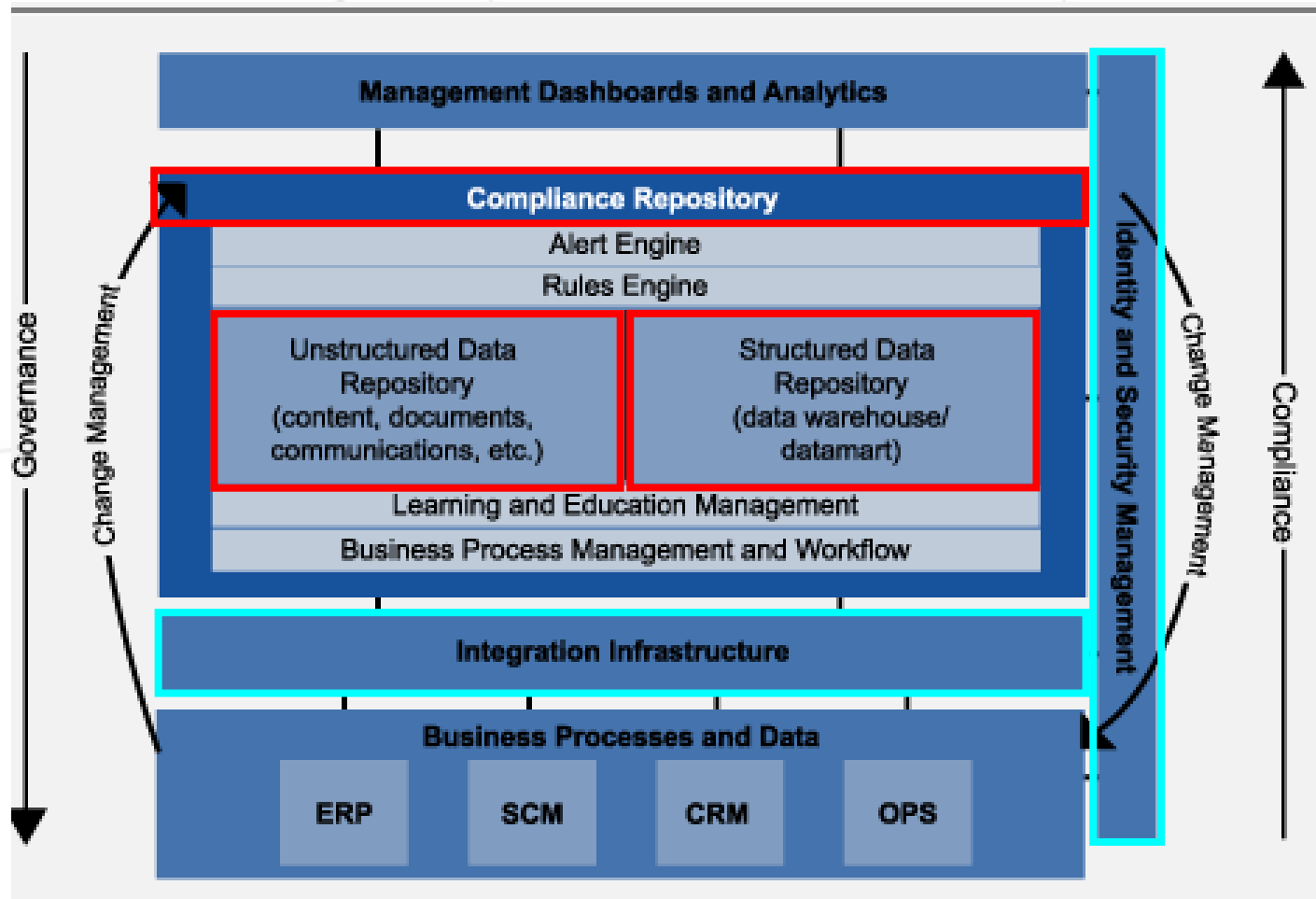
Source: AMR Research 2004

# Integration Infrastructure

## RtBaseline



# Active Compliance Architecture

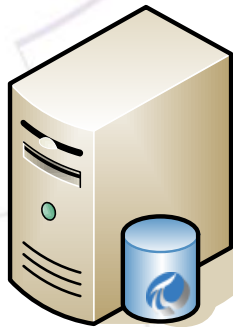


Source: AMR Research 2004

# Compliance Repository

**Structured Data**  
Data from Process,  
Instruments, SCADA

## RtBaseline



Trusted  
Connections

### PI Server

- PI Data Archives
- Module Database
- Event Data
- Alarms
- Audit Trail
- Security Database

**Unstructured Data**  
Content, Documents,  
Communications

## RtPortal



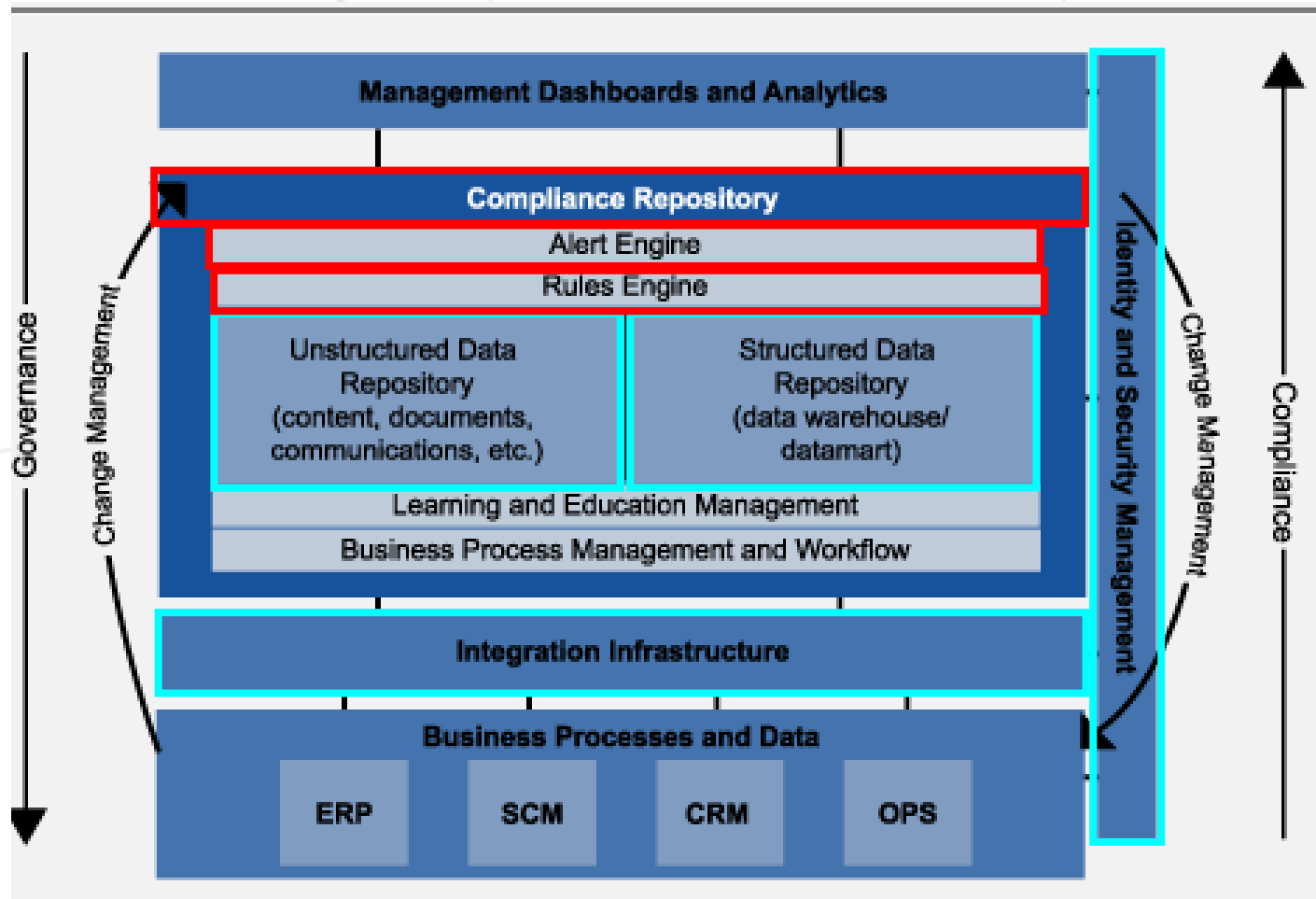
Trusted  
Connections

### SharePoint Server

- Documents
- Reports
- Portal Sites
- Web Parts
- Web Content
- Collaboration



# Active Compliance Architecture



Source: AMR Research 2004

# RtAlerts Benefits

- Communication & Collaboration
  - Accelerate problem resolution
  - Deliver notifications to the right people in your organization
  - Notification rules based on raw data or operational metrics defined in the RtPM Platform
  - Alarms acknowledgment
  - Filtered alerting during abnormal situations

The image displays three overlapping screenshots illustrating the RtAlerts system's capabilities:

- RtAlerts Rule List:** A web interface showing a list of rules. The rule "Reactor 107 Effluent Temperature" is selected. Buttons for "New...", "Clone", and "Delete" are visible. A status message at the bottom reads "Status: Cloning Rule, please wait".
- Email Notification:** A screenshot of an email titled "Limit for Reactor 107 temperature exceeded - Messag...". The subject is "Limit for Reactor 107 temperature exceeded". The body text includes: "HighLimit: 710.596 at 5/28/2004 5:20:55 PM", "High Limit: 710", and "The cooling water control valve has been...".
- PI AlarmView:** A screenshot of the PI AlarmView software interface. It shows a tree view of "Alarm Groups" on the left, a table of "Current Alarms" in the center, and "Alarm Properties" on the right. The "Current Alarms" table lists several alarms with their conditions and start times. The "Alarm Properties" window shows details for "pialm\_02", including its name, path, condition name, and actions.

Alert Engine  
Rules Engine

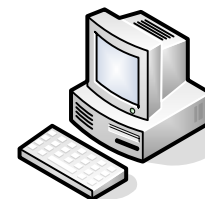
# RtAlerts

## Alert Notification Platform

### RtPortal

#### Thin Client

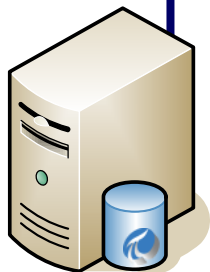
- RtAlert Configuration



Internet Explorer

### RtBaseline

### RtAnalytics

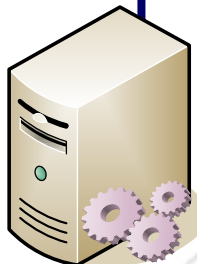


#### PI Server

- Module Database
- Alarm Subsystem



Trusted Connections



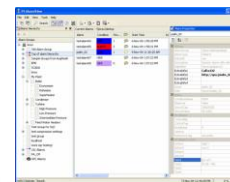
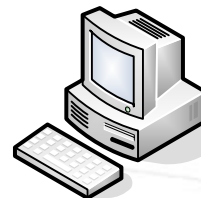
#### RtAlerts

- Advanced Computing Engine
- IIS

Plant LAN

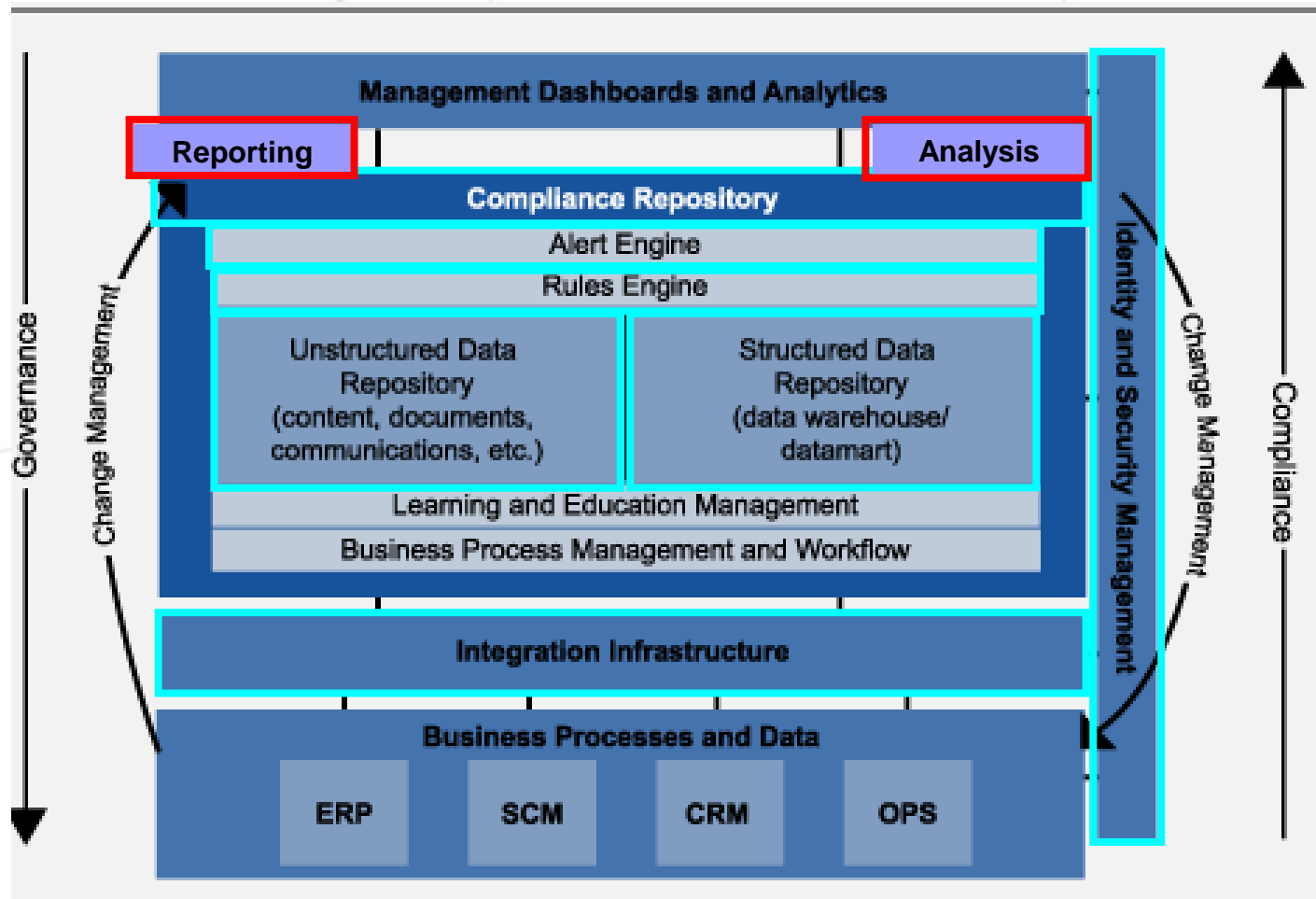
#### Smart Client

- AlarmView





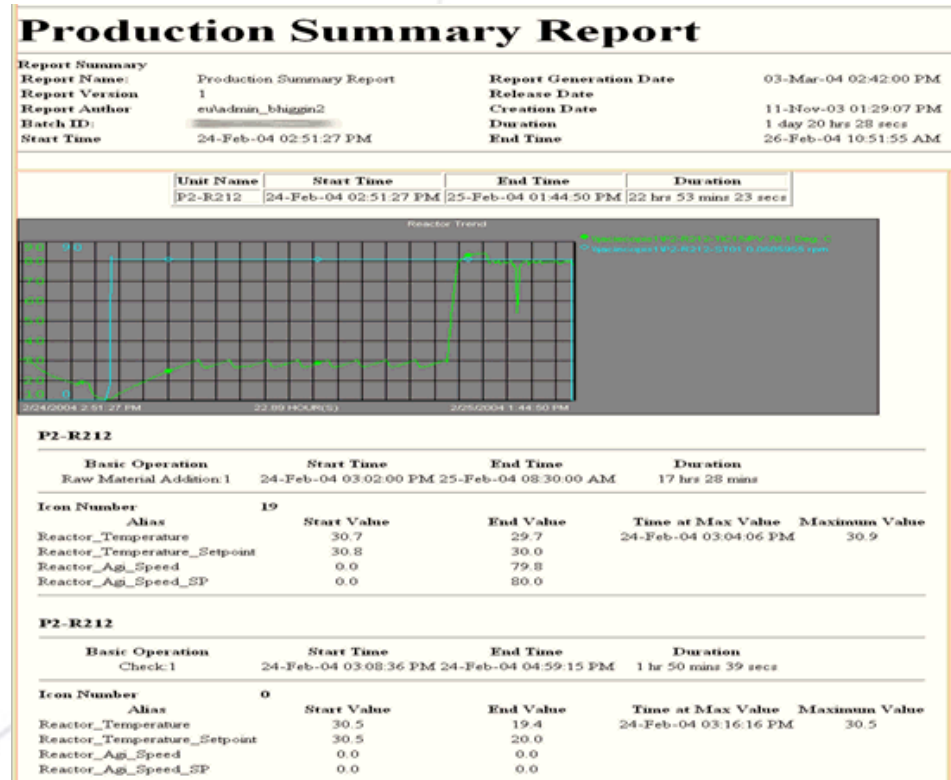
# Active Compliance Architecture +



Source: AMR Research 2004

# RtReports Benefits

- Communication and Collaboration
  - On-demand reporting, via secure Web connection
  - Comment, verify and approve functions
  - Electronic signatures and workflow provides accountability
- Knowledge Management
  - Centralization and version control
- Scalability
  - Templates can serve as enterprise standards



# Reporting

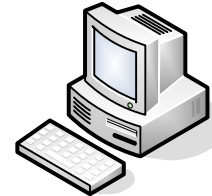
## RtReports

Version Controlled Reporting

### RtPortal

#### Thin Client

- RtReport Access



Internet Explorer

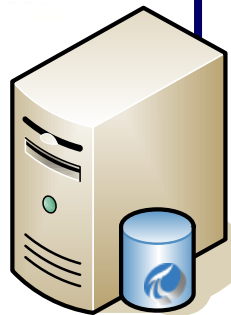
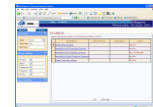
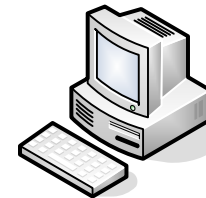
### RtBaseline

### RtAnalytics

Plant LAN

#### Smart Client

- RtReports Editor

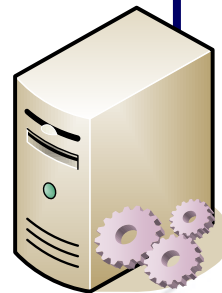


#### PI Server

- Module Database
- Batch Database



Trusted Connections



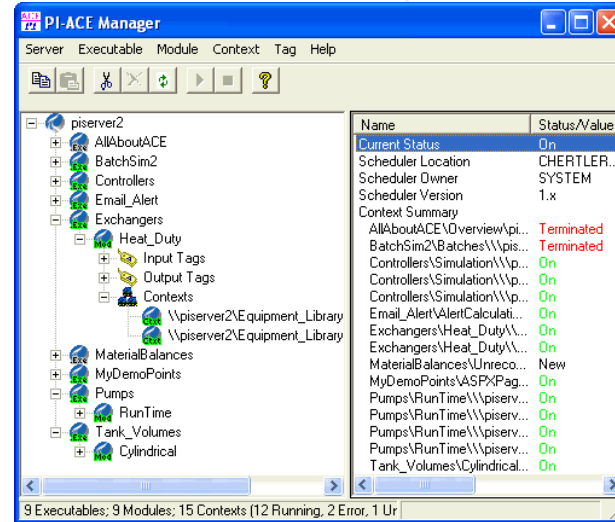
#### RtReports

- IIS



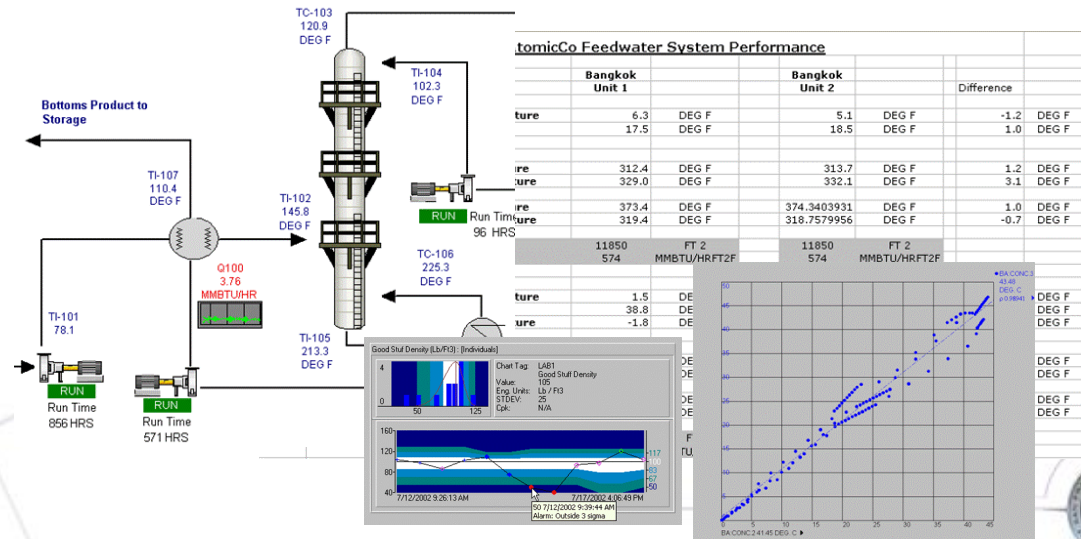
# RtAnalytics Benefits

- **Advanced Computing Engine**
  - Apply one set of equations to multiple equipment
  - Implement complex calculations with comments
  - Interaction with other applications



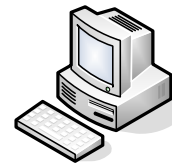
- **Smart Clients**

- ProcessBook
- DataLink
- BatchView
- SQC
- ProcessTemplates



# Analysis

## Advanced Computing Engine PI Smart Client Tools



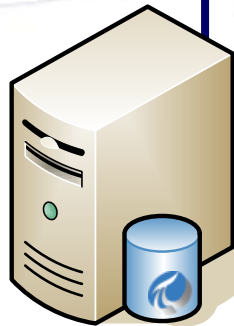
3<sup>rd</sup> Party Applications,  
Modeling Packages  
Relational Databases

RtBaseline

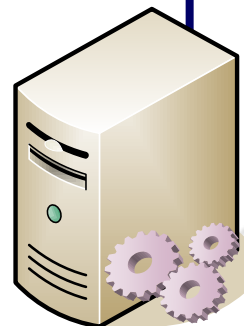
RtAnalytics

Plant LAN

RtPortal



Trusted  
Connections

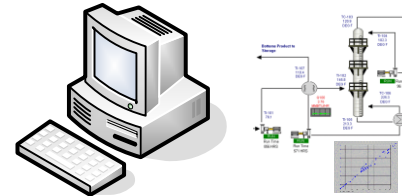


**PI Server**

- Module Database
- Alarm Subsystem

**Advanced  
Computing  
Engine**

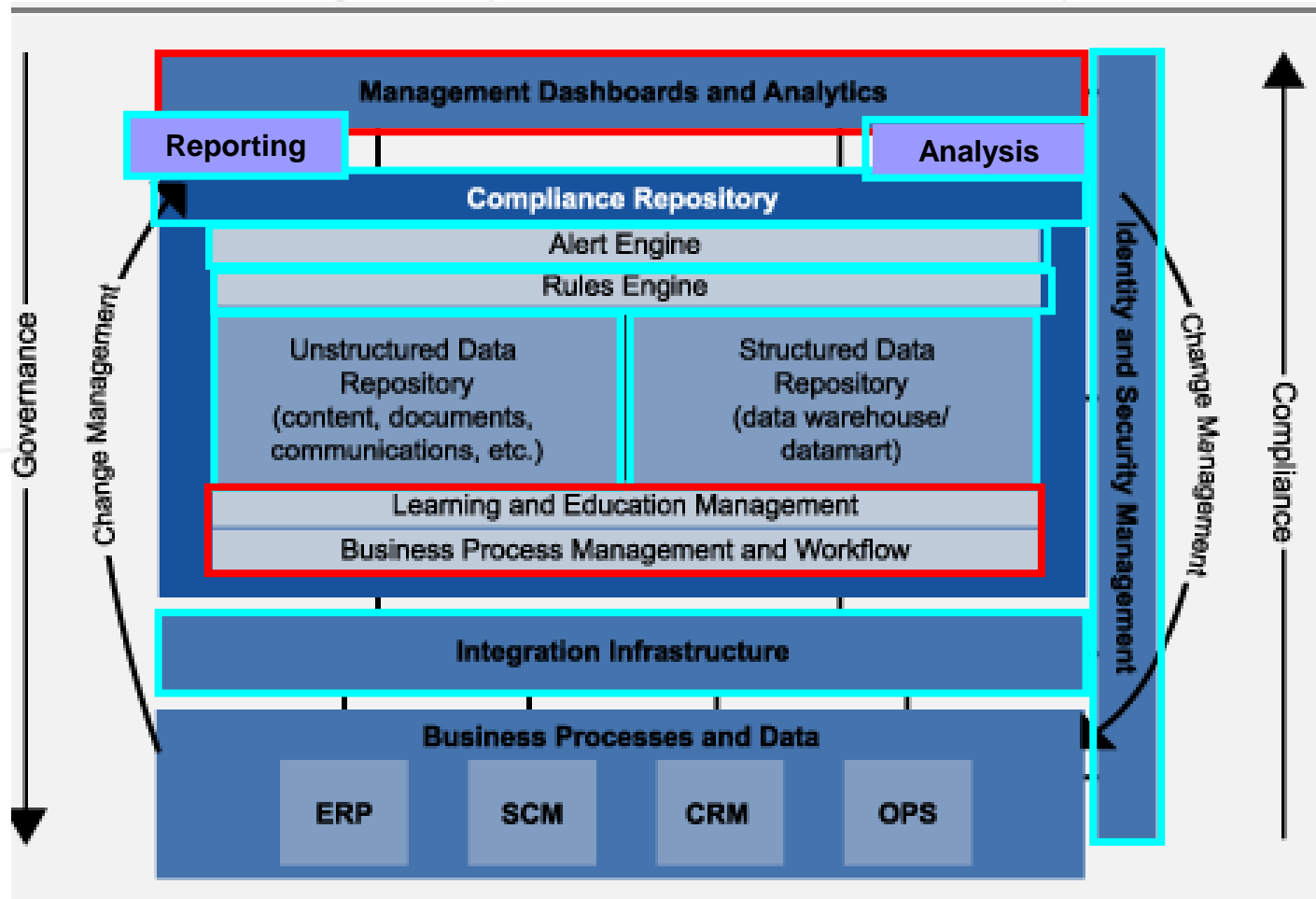
**Smart Clients**



**ProcessBook  
BatchView  
Datalink  
SQL  
Process Templates**



# Active Compliance Architecture



Source: AMR Research 2004



# Collaboration

## RtWebParts and SharePoint

Web Part Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://shareberry.osisoft.com/sites/Curt/Billings/Billings%20Refinery.aspx>

Home Documents and Lists Create Site Settings Help Up to Shareberry

Crude Unit  
**Billings Refinery** Modify Shared Page ▾

**Billings Refinery**

- Billings Refinery
  - Crude Unit
  - FCCU
  - Isomerization
  - Reformer No. 1
  - Reformer No. 2
  - Sat Gas Plant

**Process Performance**

Measurement	Target	Units	% Below	% On	% Above
Heavy Naptha Endpoint	395	Deg F	16%	80%	4%
Vacuum Heater Duty	86.9	MMBTU/Hr	0%	80%	20%
Kerosene Draw Rate	4.5	MPBD	5%	96%	1%
Crude Charge Rate	205	MPBD	29%	97%	0%

**Lab Results**

\\huckleberry\HvyNapEP

Time	Value
2/28/2005 8:00:00 PM	378
3/1/2005 6:00:00 AM	398
3/1/2005 2:00:00 PM	402
3/1/2005 11:00:00 PM	390
3/2/2005 6:00:00 AM	385

**Process Overview**

**Procedures**

Type	Name
Shutdown Procedure	NEW
Operator's Log	NEW
Shift Schedule	NEW

**Drawing File**

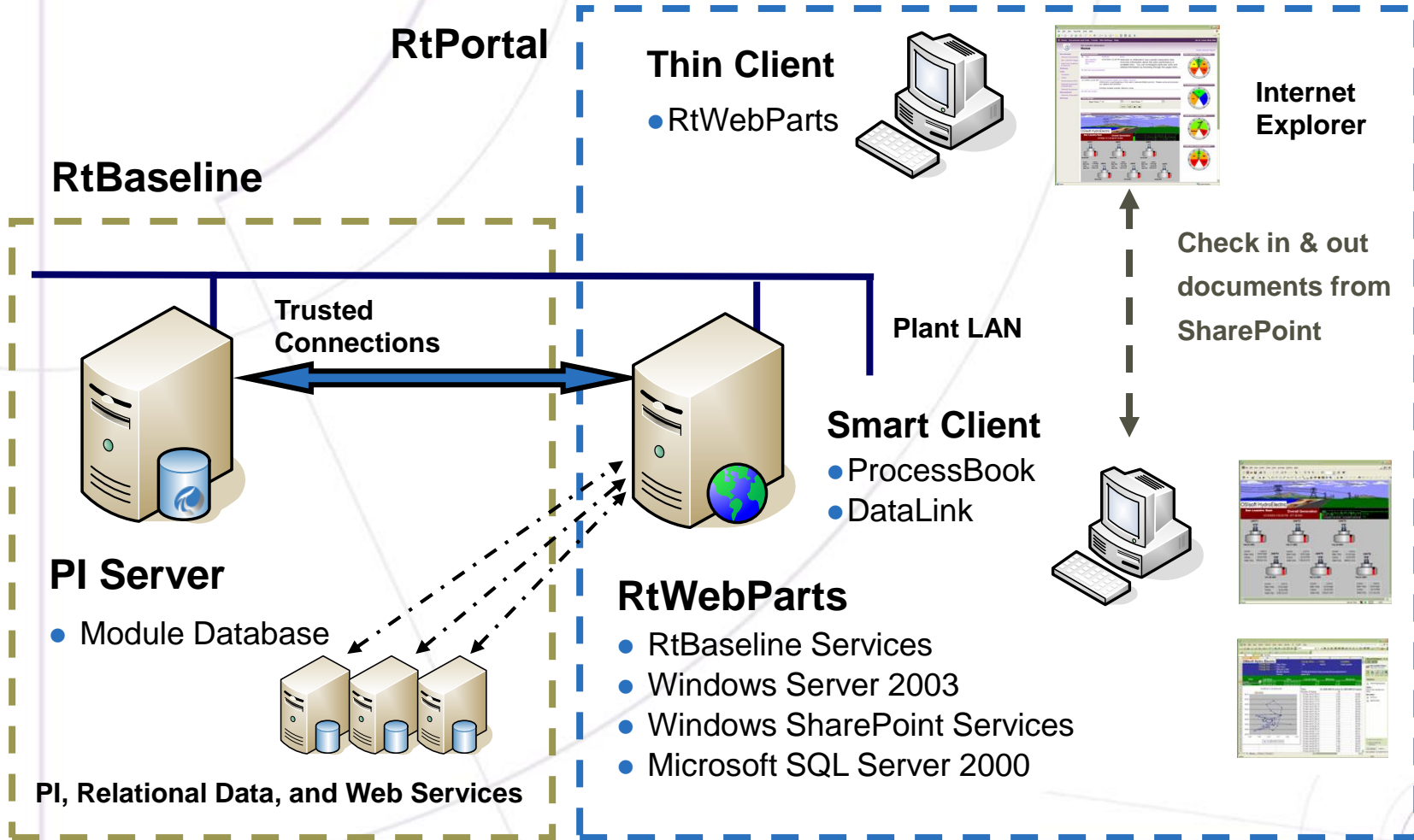
DrawingNo	Unit P&ID's
01-E456-78B	Desalter
01-E378-567	Atmospheric Heater
01-E345-592	Atmospheric Column
01-E569-234	Vacuum Heater
01E346-346	Vacuum Column

**Pump Run-Time Hours**

Descriptor	Current State	Target
Crude Charge A	<div style="width: 100%;"></div>	2000
Crude Charge B	<div style="width: 100%;"></div>	2000
Crude Charge C	<div style="width: 100%;"></div>	2000
Crude Charge D	<div style="width: 100%;"></div>	2000
Hvy. Naptha Draw B	<div style="width: 100%;"></div>	3000
Hvy. Naptha Draw A	<div style="width: 100%;"></div>	3000
Kerosene Draw A	<div style="width: 100%;"></div>	1500
Kerosene Draw B	<div style="width: 100%;"></div>	1500

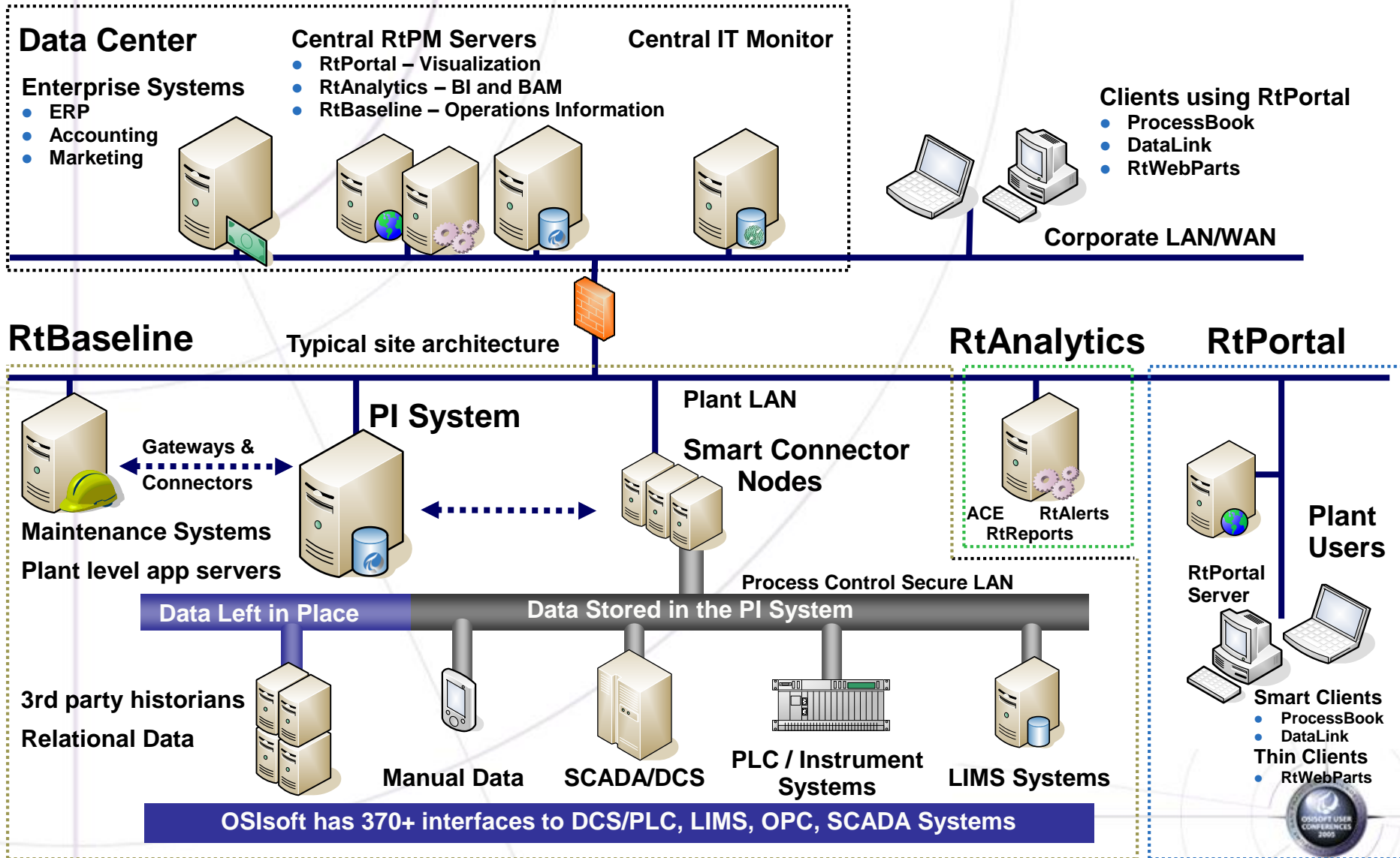
# Management Dashboards

## RtWebParts and Microsoft SharePoint





# Detailed Enterprise Compliance Architecture





# Customer Case Studies

# FDA 21 CFR Part 11 Batch Reporting

*RtPM and RtReports have given Janssen the ability to produce a higher quality, compliant product that enables the company to continue selling into a regulated industry...*



**PHARMACEUTICALS**

**Janssen Pharmaceutical Products LP**

**Corporate Headquarters:** Belgium

**Technical Environment:**  
Microsoft Windows 2000; SQL Server;  
Dell PCs; SAP

**Challenge:** To integrate control systems with higher-level business systems, optimize operations performance, reduce batch cycle time, streamline and electronicize quality assurance validation processes, move towards electronic batch reporting, and reduce the risk of not being able to sell our product into regulated markets.

**Why OSIsoft Won:** RLINK™ is a unique product on the market to integrate plant and business systems, and RtReports™ is a tool with configurable reporting value that Janssen hadn't seen elsewhere.

**RtPM Applications:**

- Automated Reports
- Baseline Best Practices
- Batch Quality Monitoring/Analysis
- Incident Investigations
- Inventory Management
- Material Usage Tracking
- Process Monitoring
- Product Compliance Monitoring/Reporting
- Production Data Integration to ERP


**Benefits:**

- Integration of business and manufacturing
- Improved communication enterprise-wide
- Fact-driven decision-making; no guesswork
- More accurate forecasting and budgeting
- Reduction of cycle time
- Reduction of Batch Book from over 100 pages to approximately four
- Easier, faster validation reporting
- More process investigations/improvements
- Improved operating efficiencies

Like many companies, Janssen Pharmaceutical was implementing SAP as their Enterprise Resource Planning (ERP) system. In order to integrate manufacturing data from the plant floor into SAP, Janssen simultaneously installed OSIsoft's Real-time Performance Management (RtPM™) Platform. For the first time, financial people, who had never before had any link to the production floor, were now costing in real time. People in Operations, Engineering, Quality Assurance (QA), Environmental, and Security were able to get multiple views from one data source, resulting in better operational visibility, process improvement, and collaboration. The use of RtPM has led to better decisions and ongoing improvements such as reduced cycle times, improved batch quality and releases, thorough incident investigations, decreased process variability, real-time costing, and better alarm management and security monitoring.

Now, with the implementation of OSIsoft's RtReports product, Janssen can provide quality assurance (QA) with a tool that streamlines the validation process for faster and more accurate compliance monitoring and reporting. The reams of paper with sign-offs and manual inputs from production to QA have been replaced with only a few targeted reports that include batch trends. Production is able to reduce cycle time with configurable, real-time batch performance reporting. Of significant importance to Janssen's business evolution is that RtReports has become a major part of Janssen's progression towards electronic batch records.

RtPM and RtReports have given Janssen the ability to produce a higher-quality, compliant product that enables the company to continue selling into regulated markets — a challenge all pharmaceutical companies face.



*"The biggest risk in this organization is that we lose the ability to sell our product into regulated markets. RtReports is directly addressing the number one risk we face."*

**Vincent Welsho**  
Systems Integration Co-ordinator  
Janssen Pharmaceutical

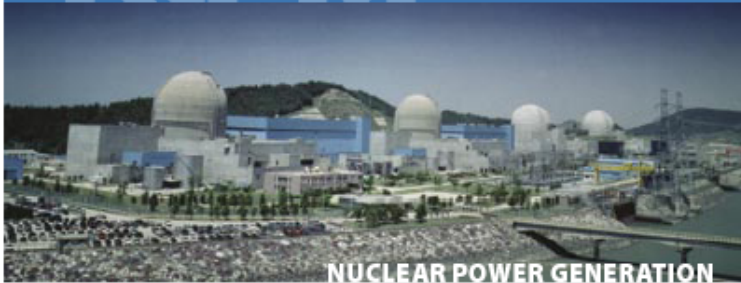
*The reams of paper with sign-offs and manual inputs...have been replaced with only a few targeted reports.*



# Continuous Emissions Monitoring

OSIsoft.

## RtPM



### Korea Hydro & Nuclear Power Co., Ltd.

**Corporate Headquarters:**  
Seoul, Republic of Korea

**Technical Environment:**  
Intel, Microsoft, Cisco, Informix

**Challenge:**  
Find an enterprise-level, unifying real-time platform that the environmental monitoring group could use to monitor and manage emissions from KHNP's nuclear power plants. Ensure that the company meets Korean environmental guidelines and provides continuous data to local communities were key requirements.

**Why OSIsoft Won:**  
OSIsoft is a reliable, SAP-certified partner providing a bi-directional link between the production floor and SAP business applications, giving KHNP a seamless flow of information from the production units to business management.

#### RtPM Applications:

- Continuous Emissions Monitor
- Corporate Data Warehouse
- Environmental Compliance Monitor
- Manual Data Recording
- Plant Performance Overviews
- Power Turbine Trip Monitor
- Process Performance Analysis
- Production Data Integration to ERP
- Waste Treatment Monitor
- Weather Data Import

#### Benefits:

- Unifies previously separate and independent environmental monitoring systems at each of the plant sites
- Gives environmental engineers real-time information to help in identifying process abnormalities and determining the corrective action
- Integrates with SAP for synchronized data from the boardroom to the plant floor
- Provides the local community with Web-based information and updates on the nuclear plant's environmental emissions, thereby improving KHNP's public image

Korea Hydro & Nuclear Power Co. monitors environmental emissions with Real-time Performance Management from OSIsoft

Formed in 2001 as the result of a government initiative to create competitive subsidiaries in the power generation industry, Korea Hydro & Nuclear Power Company (KHNP) needed to monitor different variables at its multiple nuclear power facilities. KHNP also wanted to actively manage the changing business conditions in Korea. There was increasing public and government concern about safety and the environmental impact of nuclear power. Residents in the towns surrounding the plants were demanding greater transparency of operations and systems. Additional requirements were to enhance the efficiency of information between facilities and integrate plant data with the company's SAP Enterprise Resource Planning system. To solve information access and transparency problems, KHNP chose the Real-time Performance Management™ (RtPM™) Platform from OSIsoft®.



**B.S. Lim**  
Assistant Manager  
Radiation and Environment Management  
Korea Hydro & Nuclear Power Co., Ltd.

*"We have established information sharing at the highest level, as well as enhanced productivity, secure collaboration, operational transparency and reliability, and created an image of integrity and safety to the public. Best of all, the RtPM Platform is easy to use and maintain and we continue to find more ways to use it."*

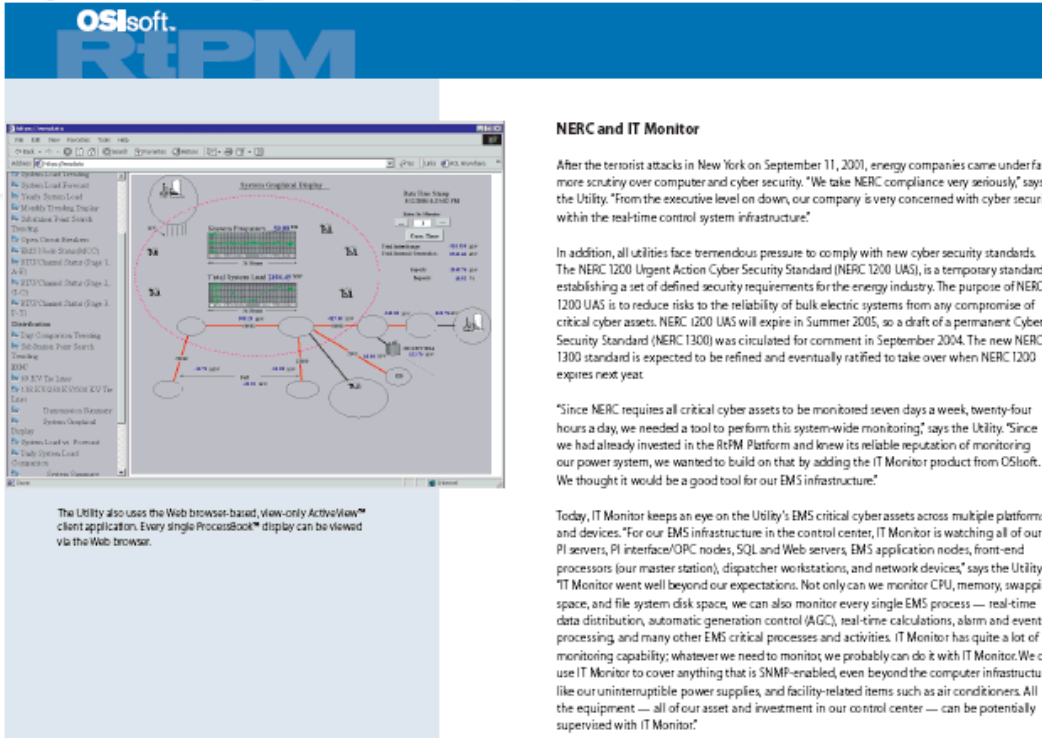
***Korea Hydro & Nuclear Power Company uses the RtPM Platform to monitor different variables at its multiple nuclear power facilities.***

***There was increasing public and government concern about the safety and the environmental impact of nuclear power.***



# Cyber Security Standard (NERC 1300)

**After the terrorist attacks in New York on September 11, 2001, energy companies came under far more scrutiny over computer and cyber security. Today, IT Monitor keeps this Utility's EMS critical cyber assets across multiple platforms and devices.**



**NERC and IT Monitor**

After the terrorist attacks in New York on September 11, 2001, energy companies came under far more scrutiny over computer and cyber security. "We take NERC compliance very seriously," says the Utility. "From the executive level on down, our company is very concerned with cyber security within the real-time control system infrastructure."

In addition, all utilities face tremendous pressure to comply with new cyber security standards. The NERC 1200 Urgent Action Cyber Security Standard (NERC 1200 UAS), is a temporary standard establishing a set of defined security requirements for the energy industry. The purpose of NERC 1200 UAS is to reduce risks to the reliability of bulk electric systems from any compromise of critical cyber assets. NERC 1200 UAS will expire in Summer 2005, so a draft of a permanent Cyber Security Standard (NERC 1300) was circulated for comment in September 2004. The new NERC 1300 standard is expected to be refined and eventually ratified to take over when NERC 1200 expires next year.

"Since NERC requires all critical cyber assets to be monitored seven days a week, twenty-four hours a day, we needed a tool to perform this system-wide monitoring," says the Utility. "Since we had already invested in the RTM Platform and knew its reliable reputation of monitoring our power system, we wanted to build on that by adding the IT Monitor product from OSIsoft. We thought it would be a good tool for our EMS infrastructure."

Today, IT Monitor keeps an eye on the Utility's EMS critical cyber assets across multiple platforms and devices. "For our EMS infrastructure in the control center, IT Monitor is watching all of our PI servers, PI interface/OPC nodes, SQL and Web servers, EMS application nodes, front-end processors (our master station), dispatcher workstations, and network devices," says the Utility. "IT Monitor went well beyond our expectations. Not only can we monitor CPU, memory, swapping space, and file system disk space, we can also monitor every single EMS process — real-time data distribution, automatic generation control (AGC), real-time calculations, alarm and events processing and many other EMS critical processes and activities. IT Monitor has quite a lot of monitoring capability; whatever we need to monitor we probably can do it with IT Monitor. We can use IT Monitor to cover anything that is SNMP-enabled, even beyond the computer infrastructure, like our uninterruptible power supplies, and facility-related items such as air conditioners. All the equipment — all of our asset and investment in our control center — can be potentially supervised with IT Monitor."

The Utility also uses the Web browser-based, view-only ActiveView™ client application. Every single ProcessBook® display can be viewed via the Web browser.

***“For our EMS infrastructure in the control center, IT Monitor is watching all of our PI servers, PI interface nodes, SQL, and Web servers, EMS application nodes, front end processors..., and network devices.”***

***-Project Manager,  
T&D Utility***



# ISO 9001, Six Sigma, OEE, KPIs

*Faced with ISO 9001 compliance and the need to implement Six Sigma in its manufacturing of high-grade nickel and cobalt products, QNI chose OSIsoft's solution to combine production data from its six business units with their total of eight separate control rooms.*



**OSIsoft**  
**RtPM**

**QNI**  
YABULU REFINERY

**Corporate Headquarters:**  
Queensland, Australia

**Challenge:** QNI faced an unavoidable need for major improvements in process software and control equipment. Replacement costs for QNI's complex facility were in excess of \$1 billion. QNI needed a high-performance IT infrastructure to standardize on an overall operations approach, maximize existing plant output, improve work processes and efficiencies, reduce waste, and meet customer expectations.

**Why OSIsoft Won:** The RtPM Platform builds on OSIsoft's industry-leading PI System™ data engine by providing an integrated product family that makes critical, actionable operations information visible across all levels, enterprise-wide.

**RtPM Applications:**

- Alarm Management
- Automated Reports
- Balance Scorecards
- Baseline Best Practices
- Batch Quality Monitor
- Data Reconciliation
- Downtime Monitoring
- Key Performance Indicators (KPI)
- Lab Quality Data Integration
- Material Balance
- Quality Monitoring/Analysis
- Six Sigma
- SPC/SQC Production Quality Control
- Total Effective Equipment Productivity

**Benefits:**

- Real-time quality measurement results ensure high-quality cobalt production
- Achieved 9001 certification Quality Assurance/ Six Sigma goals
- Minimized downtime
- Automatically generated maintenance notifications in SAP
- Validated production information; verified data quality; monitoring and reporting of exactly where losses occur; calculation of monthly reconciled recovery

QNI uses OSIsoft's RtPM Platform to control refinery operations and gain 41 percent IRR in 3.5 years

Until a few years ago, QNI's cobalt/nickel refinery in Yabulu, Australia, used manual process-recording methods. Process engineers found it difficult to determine the influence of variables on product quality, and to generate timely reports for management. Management was frustrated by the challenges of accounting for monthly reconciled recovery, determining where losses occurred, and tracking quality by batch.

To gain control over its operations and processes, QNI needed to track key performance indicators (KPIs) and overall equipment effectiveness (OEE). Though QNI already had a functioning ABB distributed control system, it couldn't store process data for more than three weeks — not really long enough to track production records and monitor KPIs. Faced with ISO 9001 compliance and the need to implement Six Sigma in its manufacture of high-grade nickel and cobalt products, QNI chose OSIsoft's solution to combine production data from its six business units with their total of eight separate control rooms.

RtPM allows QNI to align products with specs, meet ISO 9001 quality assurance requirements, begin Six Sigma projects, and — best of all — pay off the capital and engineering costs of the Real-time Performance Management Platform™ (RtPM™) in 3.5 years. The system tracks KPIs and OEE, reduces scrap and risk, and stores shift logs electronically rather than on paper. It tracks plant operating conditions required for ISO 9001, warns operators when process conditions vary from setpoints, and lets management proactively resolve potential problems.



**Dave Hunter**  
Group Leader of Metallurgical Accounting, QNI

*"We've used the RtPM Platform to benefit our operations in many ways — from tracking product quality to justifying Six Sigma process improvement projects. The RtPM Platform has accomplished more than we set out for it, and we've easily achieved an initial rate of return (IRR) on our*

***"The RtPM Platform has accomplished more than we set out for it, and we've easily achieved an initial rate of return on our investment within three and a half years."***

***-Dave Hunter,  
Group Leader Metallurgical  
Accounting***



# Collaboration

*The RtPM Platform is integrated and well-connected with other systems in the CITGO network, allowing managers and other staff members at the Tulsa, OK corporate headquarters to view performance metrics in Corpus Christi.*



**Corporate Headquarters:**  
Tulsa, Oklahoma

**Technical Environment:**  
Windows Server 2000, Microsoft SQL Server, SAP PM, and Oracle

**Challenge:** Upgrade the company's information infrastructure; reduce losses wherever possible; use more strategic tools and methods to optimize refinery operations.

**Why OSIsoft Won:** Useful collaboration; the RtPM Platform delivers concise, time-driven information that is actionable. Other platforms only report past performance, not performance in real time. Gives every user the ability to exercise their creativity in problem solving.

**RtPM Applications:**

- Automated Reports
- Baseline Best Practices
- Material Usage Tracking
- Plant Performance Overviews
- Production Analysis
- Production Plan vs. Actual Data
- Quality Monitoring/Analysis
- Root Cause Analysis

**Benefits:**

- Higher productivity
- Increased efficiency
- Increased cost savings
- Better decision making
- Single-page operational views

**Real-time Information drives productivity higher at CITGO'S Corpus Christi Refinery**

The Corpus Christi Refinery (CCR) of the CITGO enterprise was dealing with all too common issues — an out-of-date historian that was substandard for collecting vital process and operations data, and an inevitable upgrade if operations were to be optimized. Although the current system helped the company view, measure and report production levels, it was difficult to ensure efficient operation and utilization. Reconfiguring the old system would be ineffective and prohibitively expensive. It was estimated that it would take seven to ten employees and a half-a-million dollars to replace the database's functionality.

In early 1997, CITGO CCR accepted the initiative to acquire a Y2K compliant infrastructure that delivered not only the real-time data needed to monitor and analyze conditions more efficiently, but one that provided rich desktop tools to continuously improve processes and establish best practices. For this, the company turned to OSIsoft's Real-time Performance Management (RtPM) Platform. The Microsoft-based platform was easy to implement and use, speeding information to every person for better analysis and decision making.

Today, RtPM has enabled CITGO operations to achieve higher productivity, increased efficiency and cost savings. Now, there's "one version of the truth" about real-time and historical performance that the company counts on to run profitable operations.



**Dennis Lawless**  
CITGO CCR's Information Analyst  
and PI Administrator

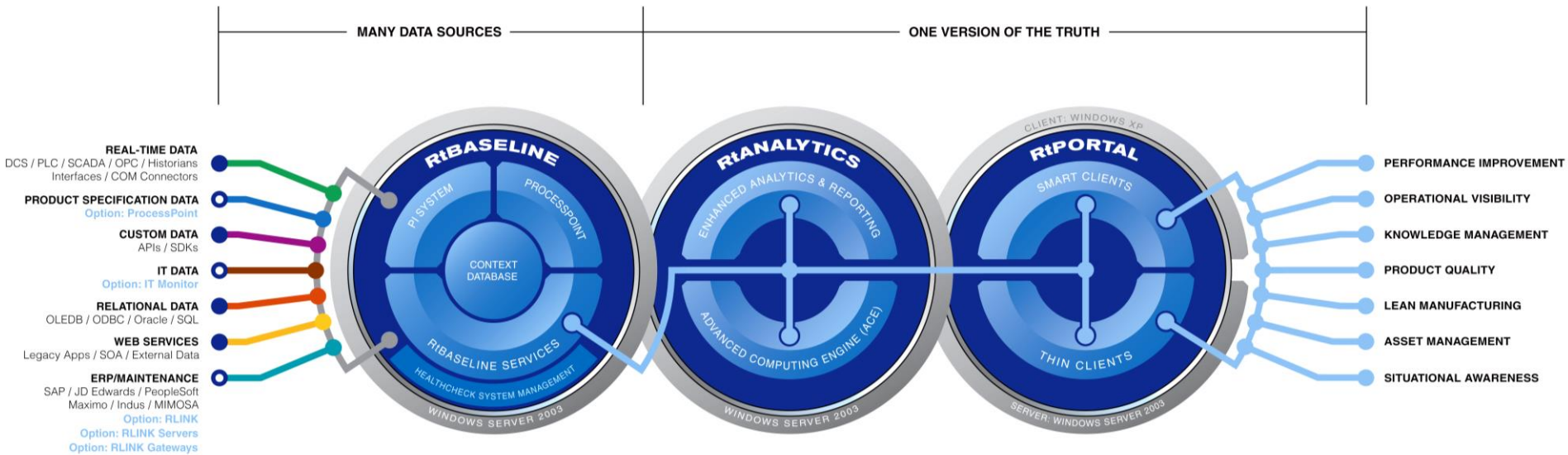
*"There's not a part of the Corpus Christi operation that's not connected to, or touched by, the RtPM Platform. Having all of the data at our fingertips, plus the RtPM desktop tools, has enabled the distribution of information into more business units."*

*“Workers know exactly what’s happening in a process and realize the value they can add by doing their part to improve higher value yields.”*

*-Dennis Lawless,  
CITGO CCR’s Information  
Analyst and PI Administrator*



# OSIsoft RtPM Platform



***The OSIsoft platform provides comprehensive visibility into operations, unlocking the potential for timely analysis – fueling critical, informed and profitable actions.***