Sustainability in O&G from Advanced Real-Time Business Integration

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OSIsoft, LLC Houston, TX

June 15, 2010

Agenda

- O&G Business Challenges and Response in the 21st Century
- Sustainability in O&G
- The Evolving Real-Time Infrastructure
- Advanced Real-Time Business Integration
- Case Study
- Summary and Concluding Remarks

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O&G in the 21st Century-Doing More with Less ……..With Increasing Risk and Opportunity

Increasing……

Social

- Expectations
- Energy Demand and Diversity
- Constraints and considerations

Environmental

- Regulations
- Legislation
- Implications

Economic

- Challenges
- Opportunities
- Risks

Information

- Operational
- Business
- Social

COMPLEXITY

O&G in the 21st Century-Doing More with Less ……..With Increasing Risk and Opportunity

Decreasing……

Human Capital

- People
- Knowledge
- Experience

Time

- Global Competition
- Information Technology
- Expectations & Norms

Reserves

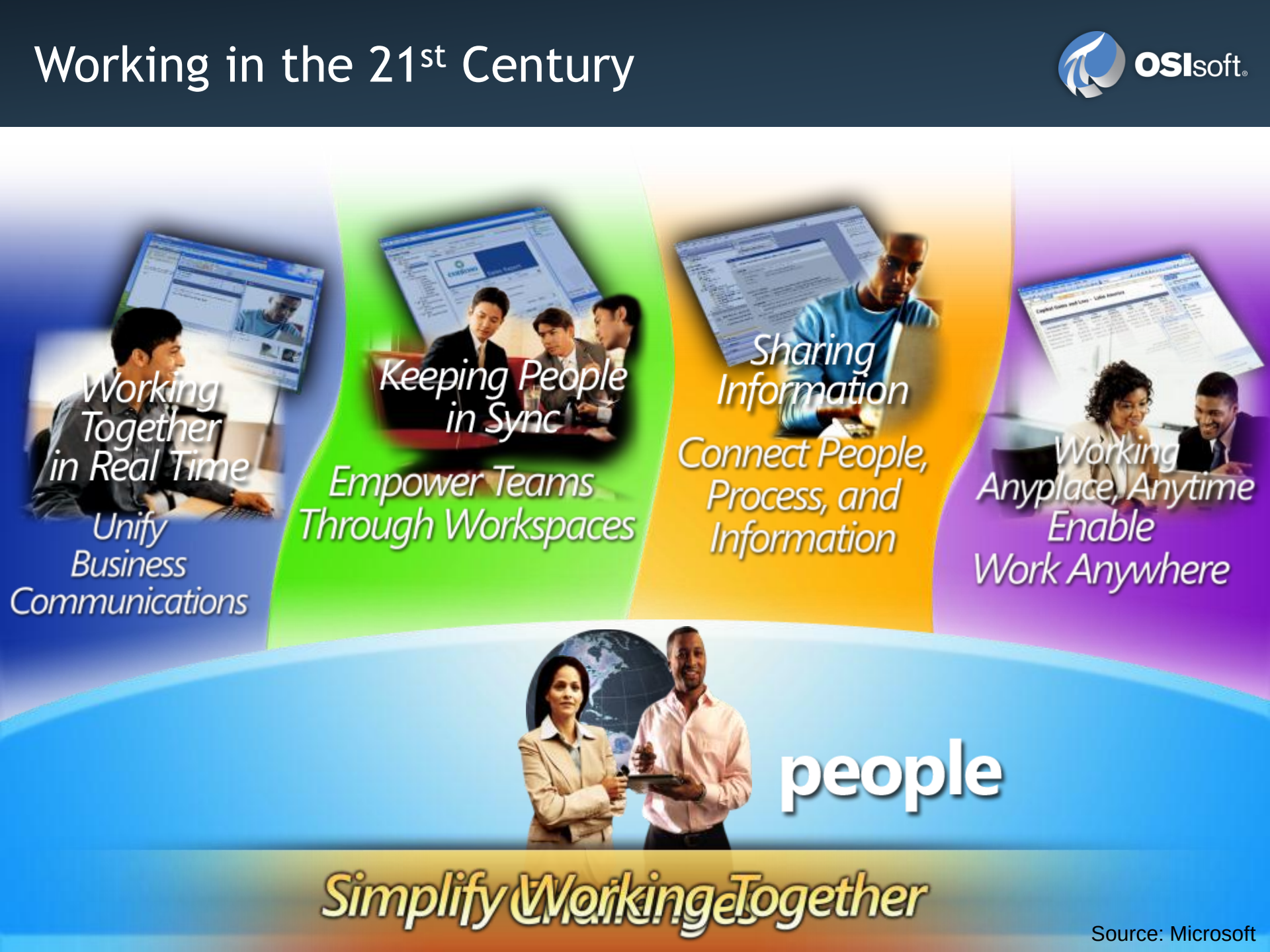
- Depletion of existing
- Security/Diversity
- Nationalization

Flexibility

- Regulations
- Expectations
- Processes & Procedures

Resources

Working in the 21st Century



Source: Microsoft

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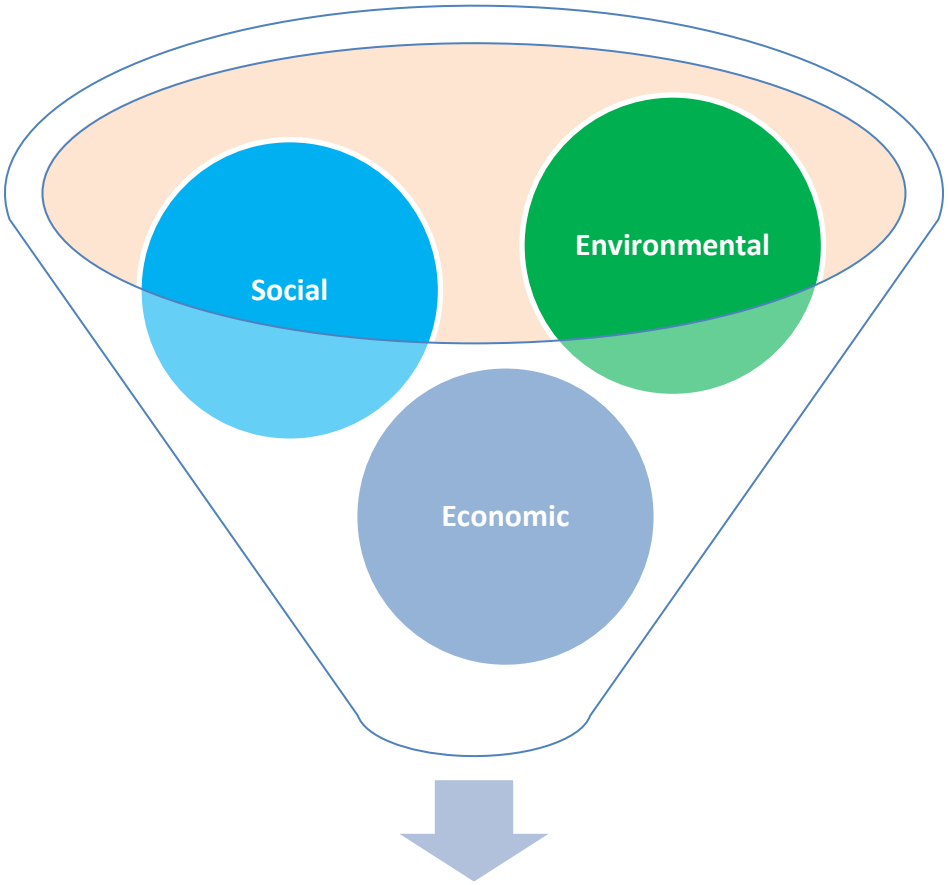
Sustainability - A Macro View of Business Viability and Sustainable Value Over Time



Sustainable Business Value Over Time

The Foundation to Sustainability- Real-time Information

"Real-Time information is the currency of the new decade and companies that can monetize their real time information the most effectively will be the ones who will sustain and survive".

"The continuing evolution of the Real-time infrastructure offers the opportunity for advanced business integration in support of sustainability"

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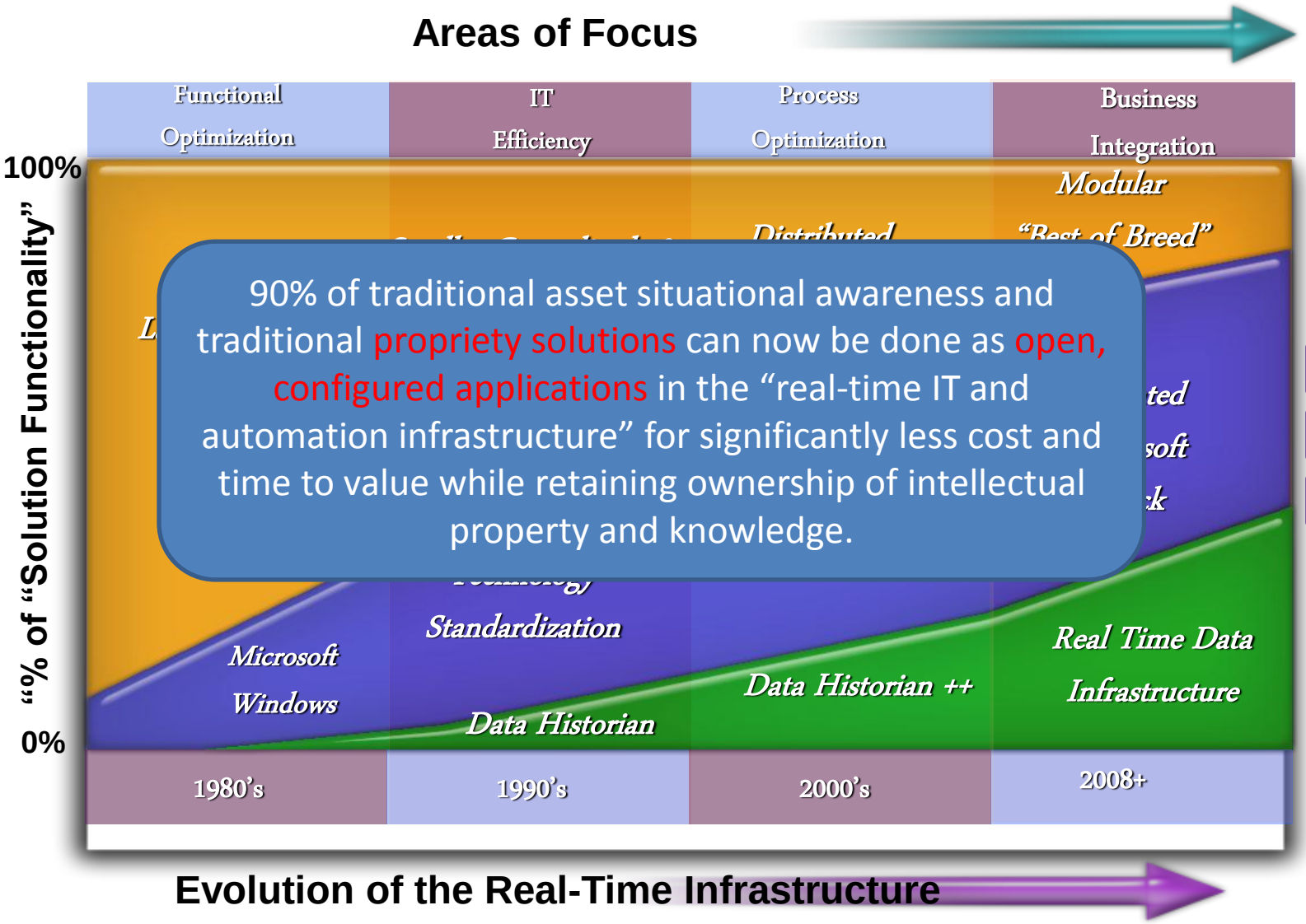
The Evolving Capability & Role of IT Infrastructure



Solution Code

Microsoft Infrastructure

Office SharePoint Server 2007

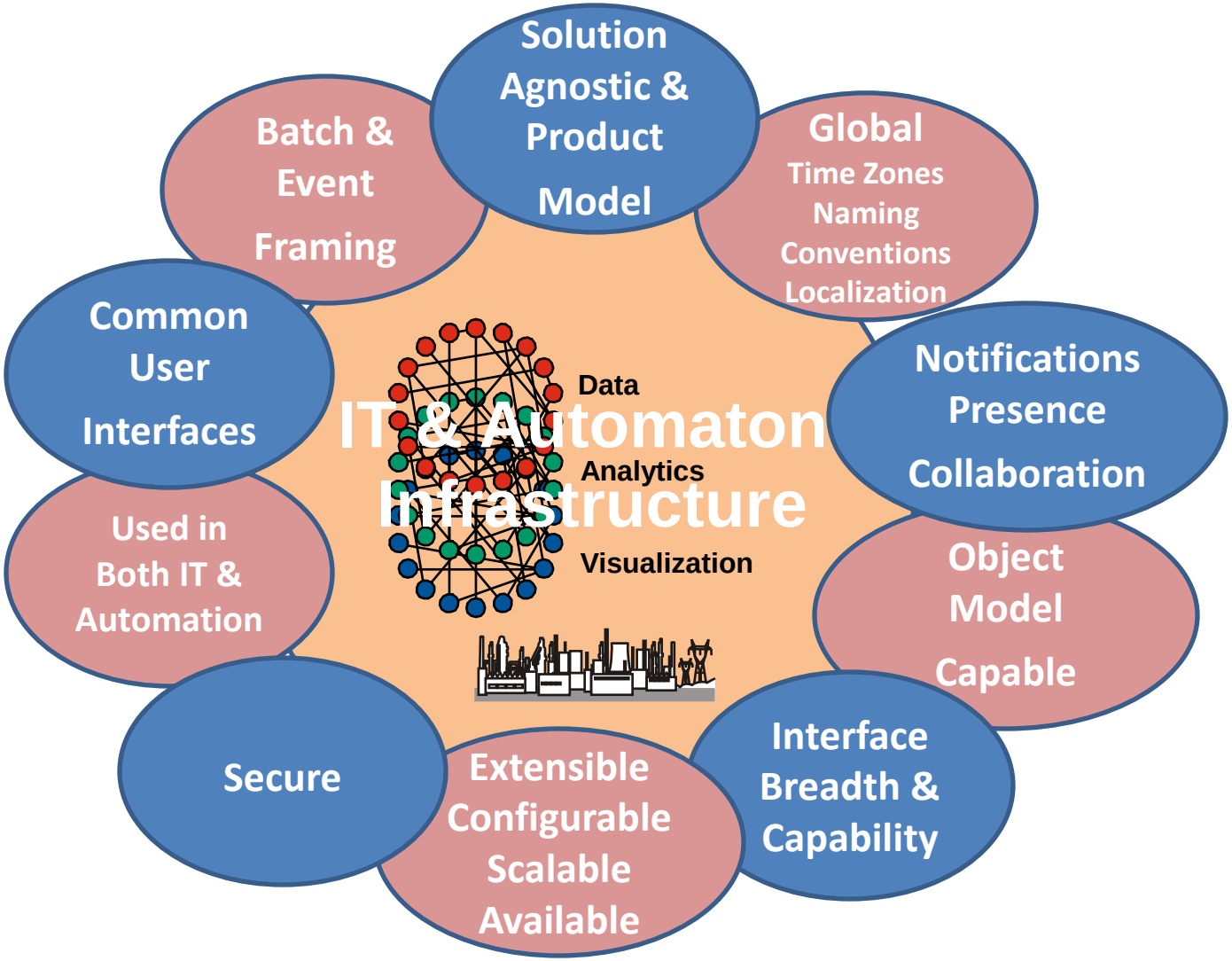
Office

SQL Server 2008

PI System Infrastructure

Empowering Business in Real Time.

Top Attributes of a World Class IT & Automaton Infrastructure



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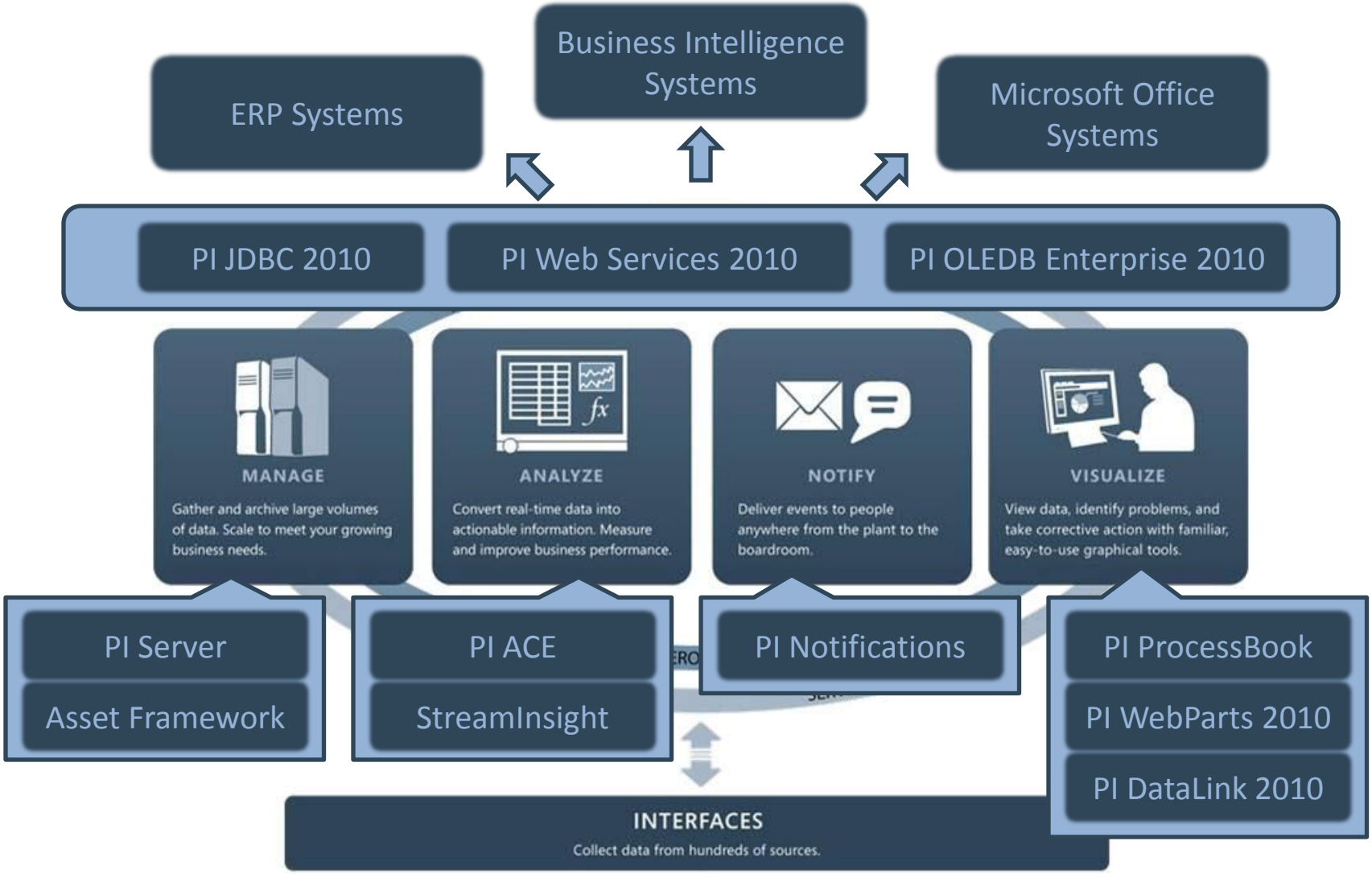
PI System 2010



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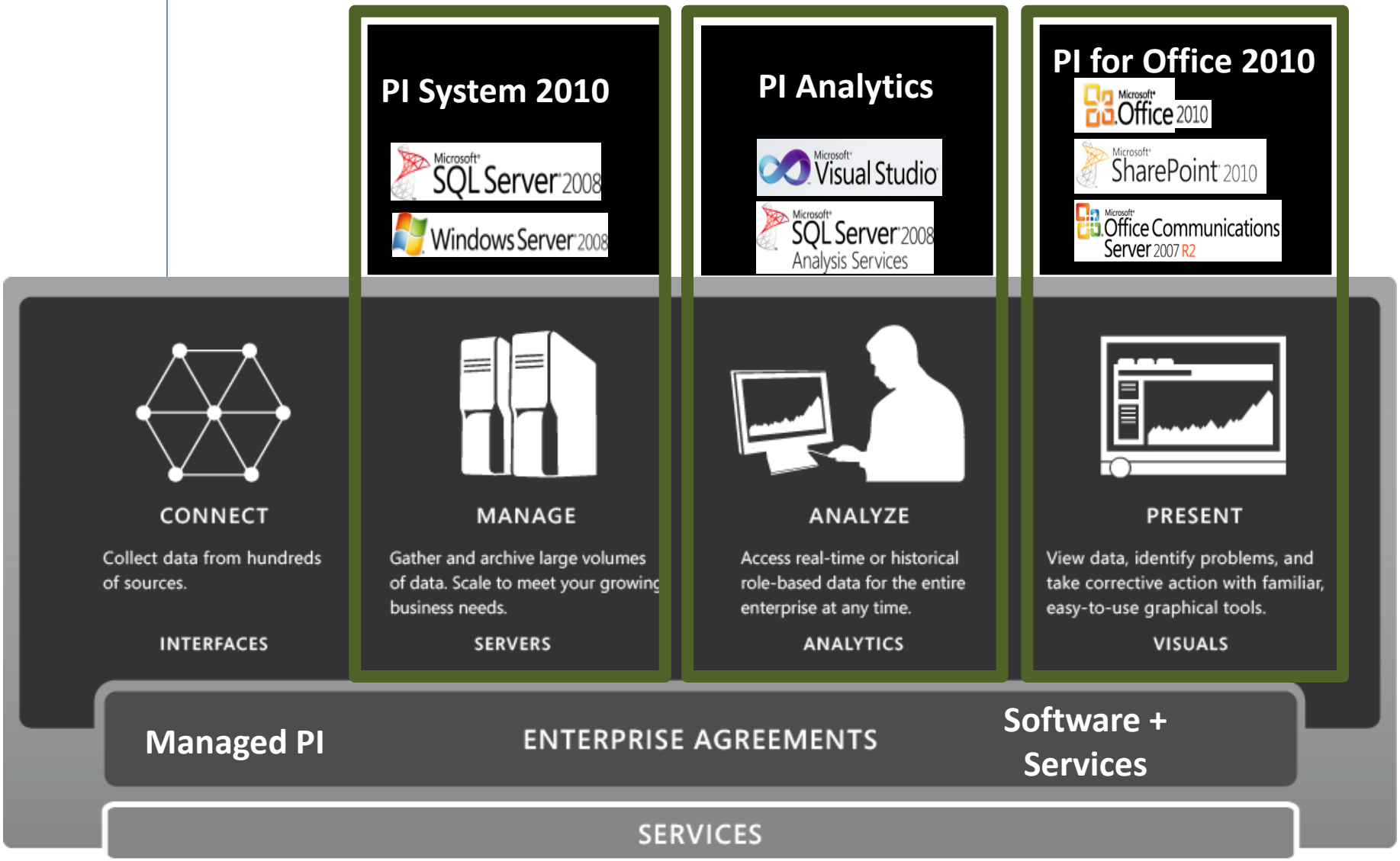
PI System Integration with the Microsoft Stack



Empowering Business in Real Time

Decomposing the Asset CBM "Solution"

Asset Management CBM "Solution"

Gather Asset Information

Temperature
Flow
Pressure
Vibration

Transform into Performance Information

Efficiency (%)
Design vs Actual
Rate of Change
SQC

CBM

Time in Service
Total Volume
Performance DvA
Max T or Vib

Generate

KPIs

Trends

Alerts

Integrate into work flow Systems

(ie Maximo, SAP, Meridian)

Functionality Done in PI and Microsoft

Empowering Business in Real Time.

Real-Time Pump Performance

MAKE UP PUMP A

ELECTRIC DRIVE MOTOR

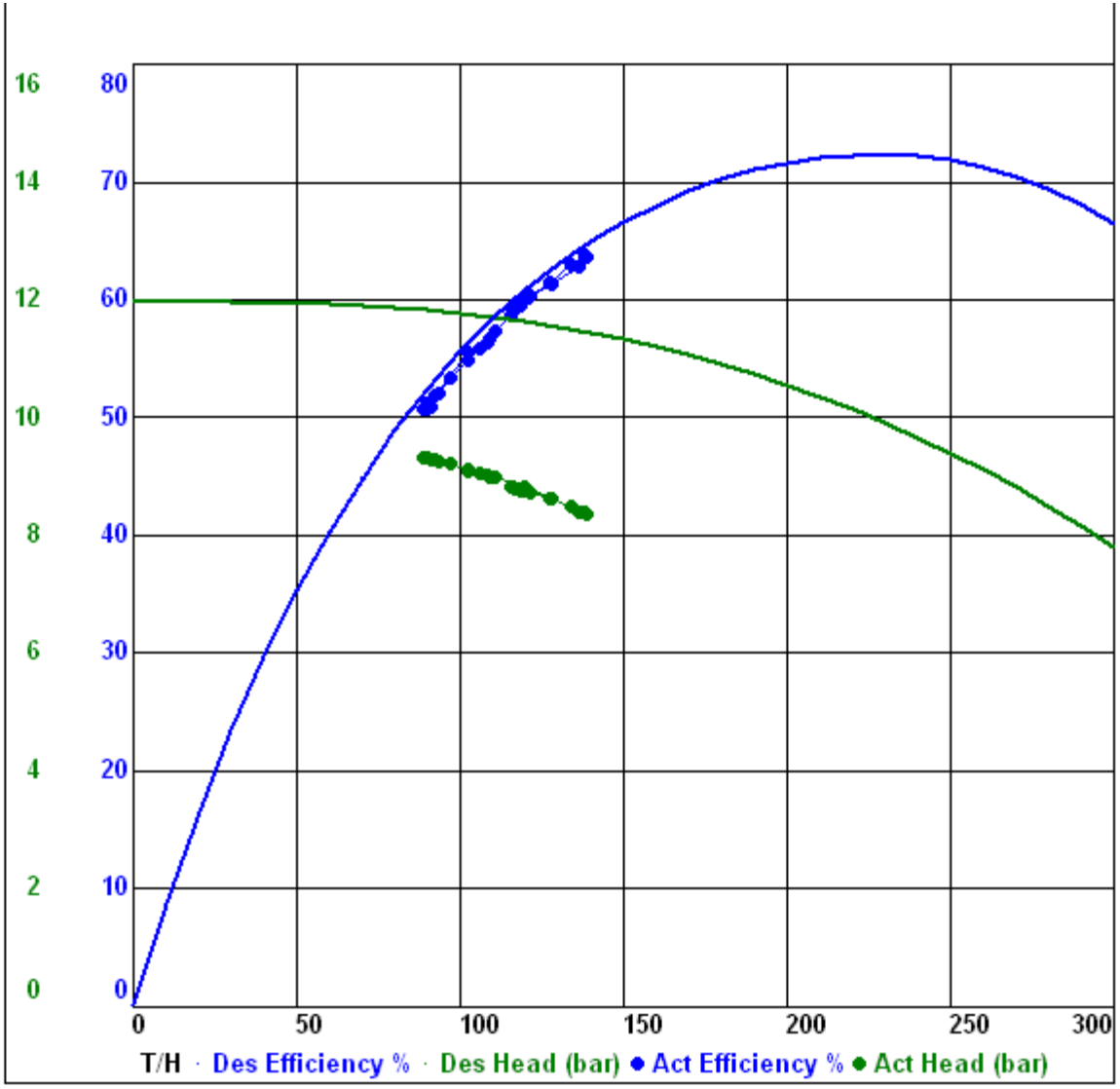
Voltage:	380 V
Current:	142.0 A
Power:	53.9 kW

PUMP PERFORMANCE

Pump Speed:	2955 RPM
Flowrate:	109.1 T/H
Fluid Power:	27.5 kW
Suction Head:	1.05 bar 10.9 m
NPSH:	1.94 bar 20.1 m
Discharge Head:	10.04 bar 103.6 m

	ACTUAL	DESIGN
Total Head:	8.98 bar 92.7 m	11.72 bar 121.0 m
Efficiency:	56.7 %	58.2 %

Process Plugins™



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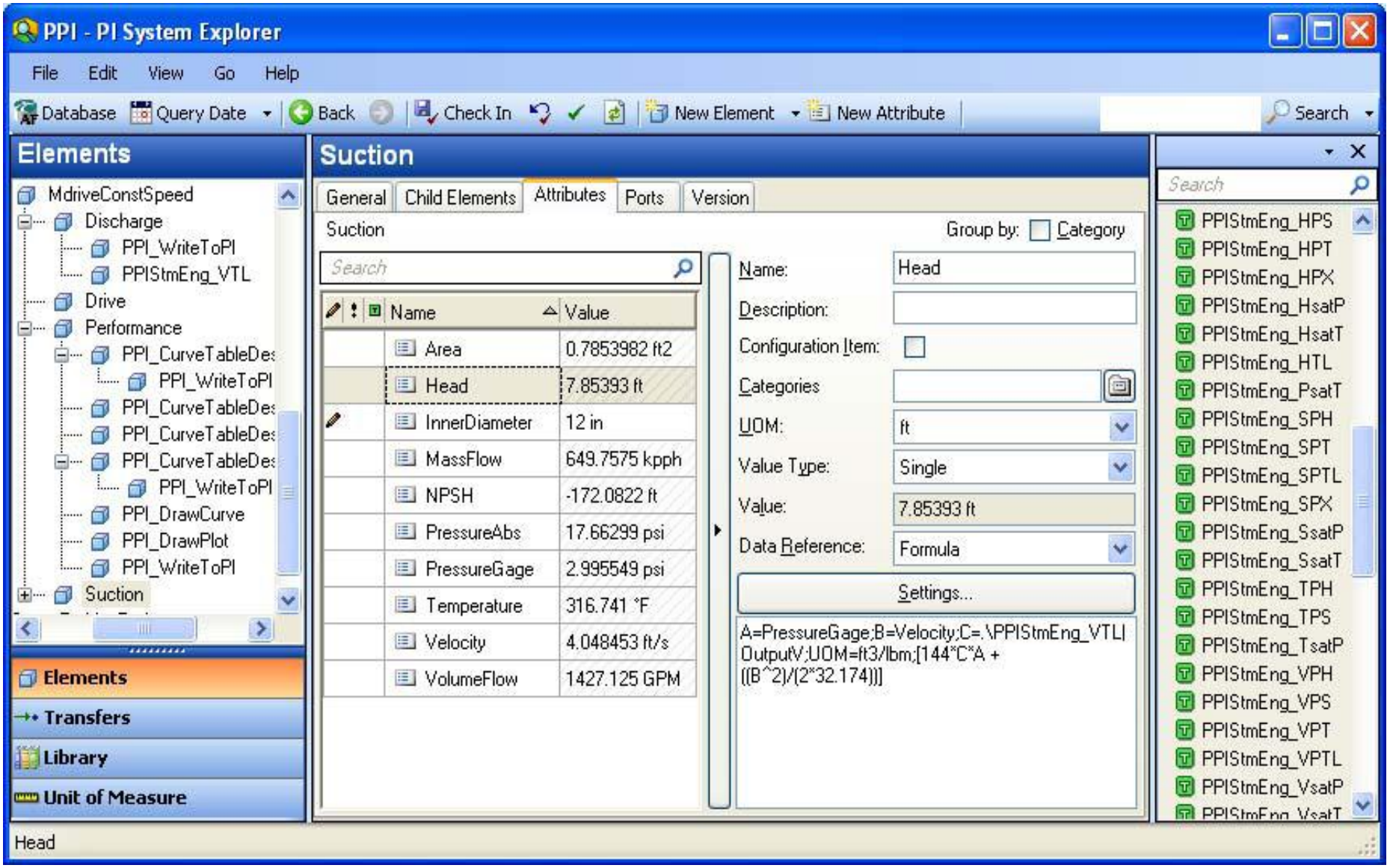
Pump Performance Analytics in AF



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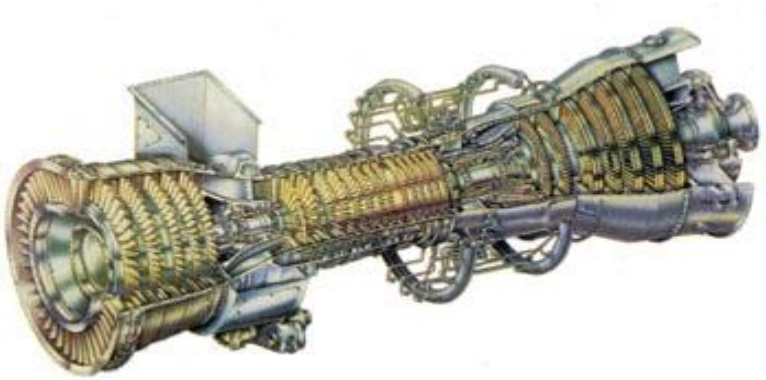
Thermodynamic Performance Monitoring

- Thermodynamic calculations in the infrastructure for:
  - Steam Turbines
  - Gas Turbines
  - Towers
  - Compressors
  - Heat exchangers
  - Furnaces
  - Pumps



Decomposing the Energy Management "Solution"

Energy Management "Solution"

Gather Process Information
Temperature (Deg C)
Flow (BPD)
Pressure (PSIG)
Electrical Usage (MW)

Transform into Energy Information
Energy (BTU/Hr)
Efficiency (%)

Combine into Systems
Unit/Plant (FCCU)
System (Fuel Gas, Hydrogen, etc)

Generate KPIs and Other Summary Information

Develop Models for Optimization (Plan vs Actual, Control)

Functionality Done in PI and Microsoft

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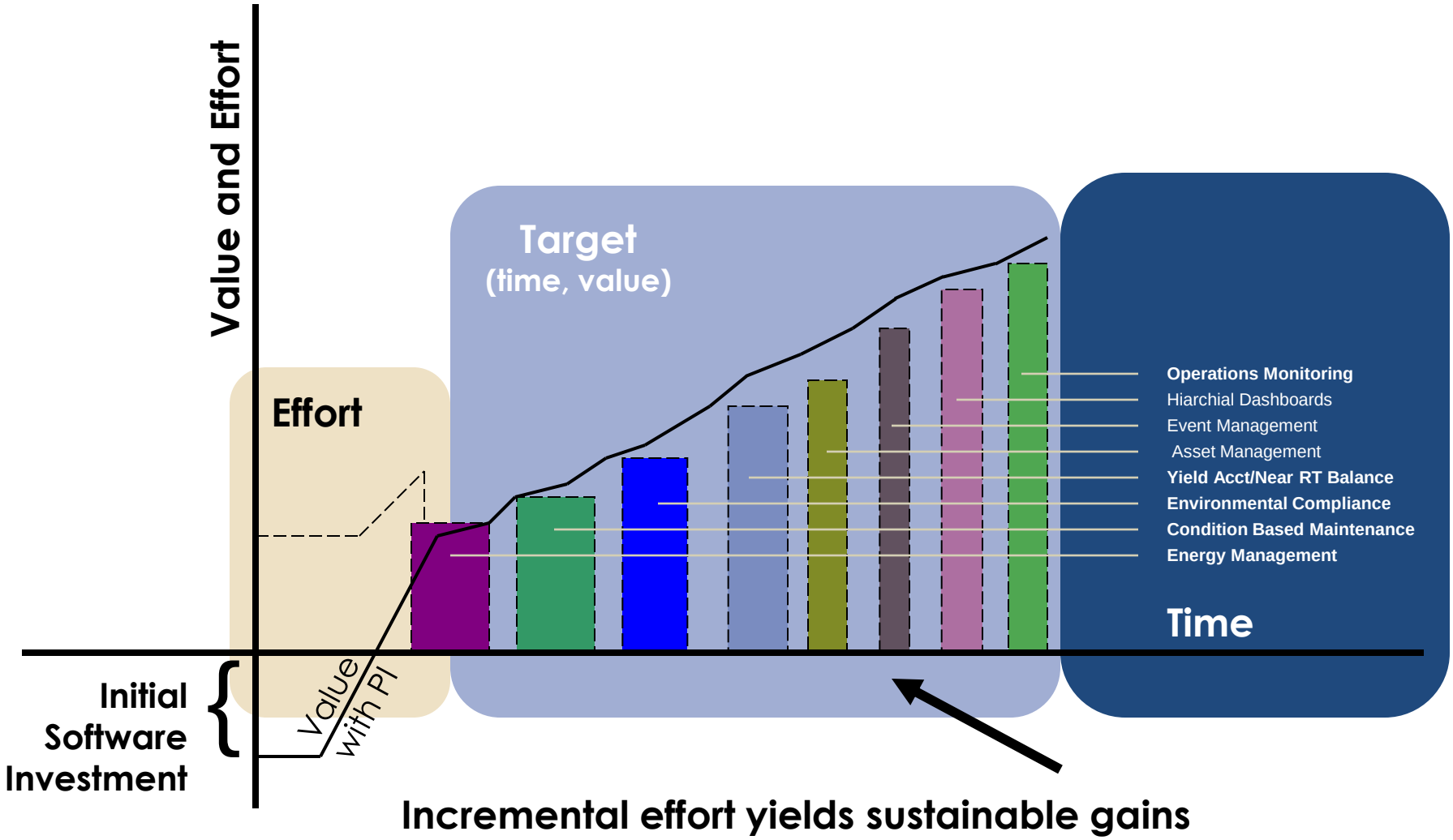
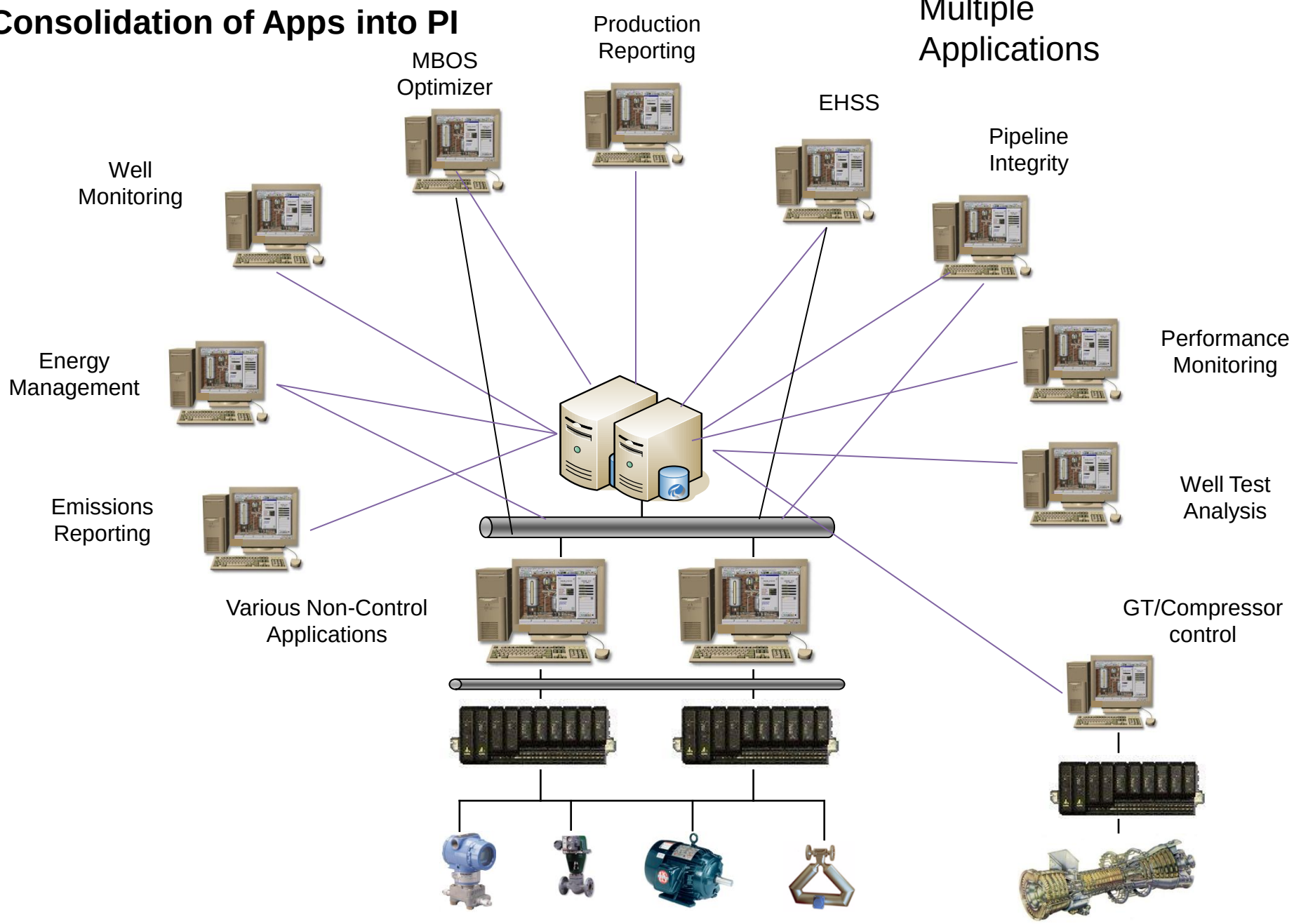
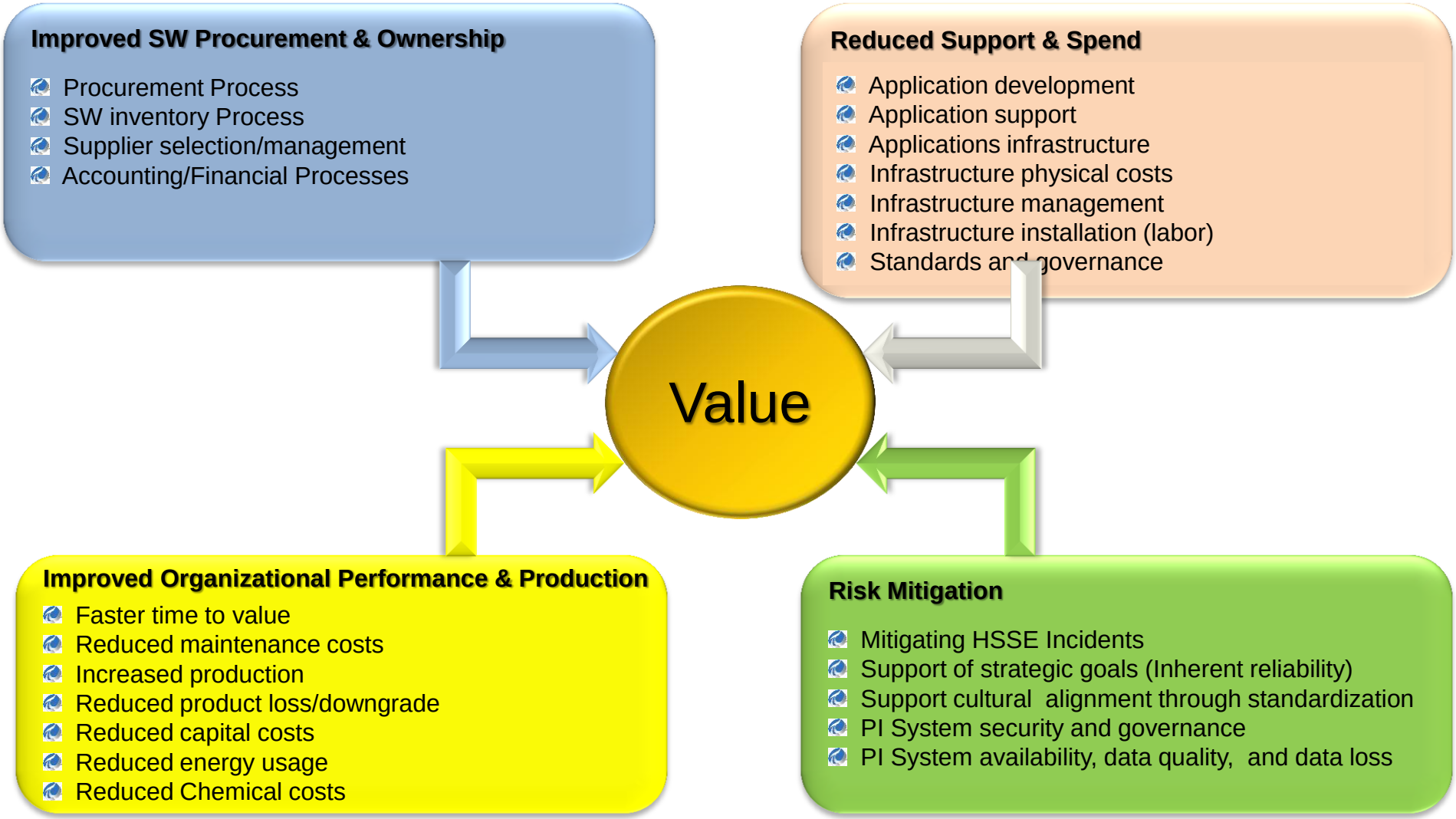
Supporting an Evolutionary Approach



Example – E&P Platform
Consolidation of Apps into PI



Value Proposition from Leveraging PI Strategically as a Real-Time Infrastructure



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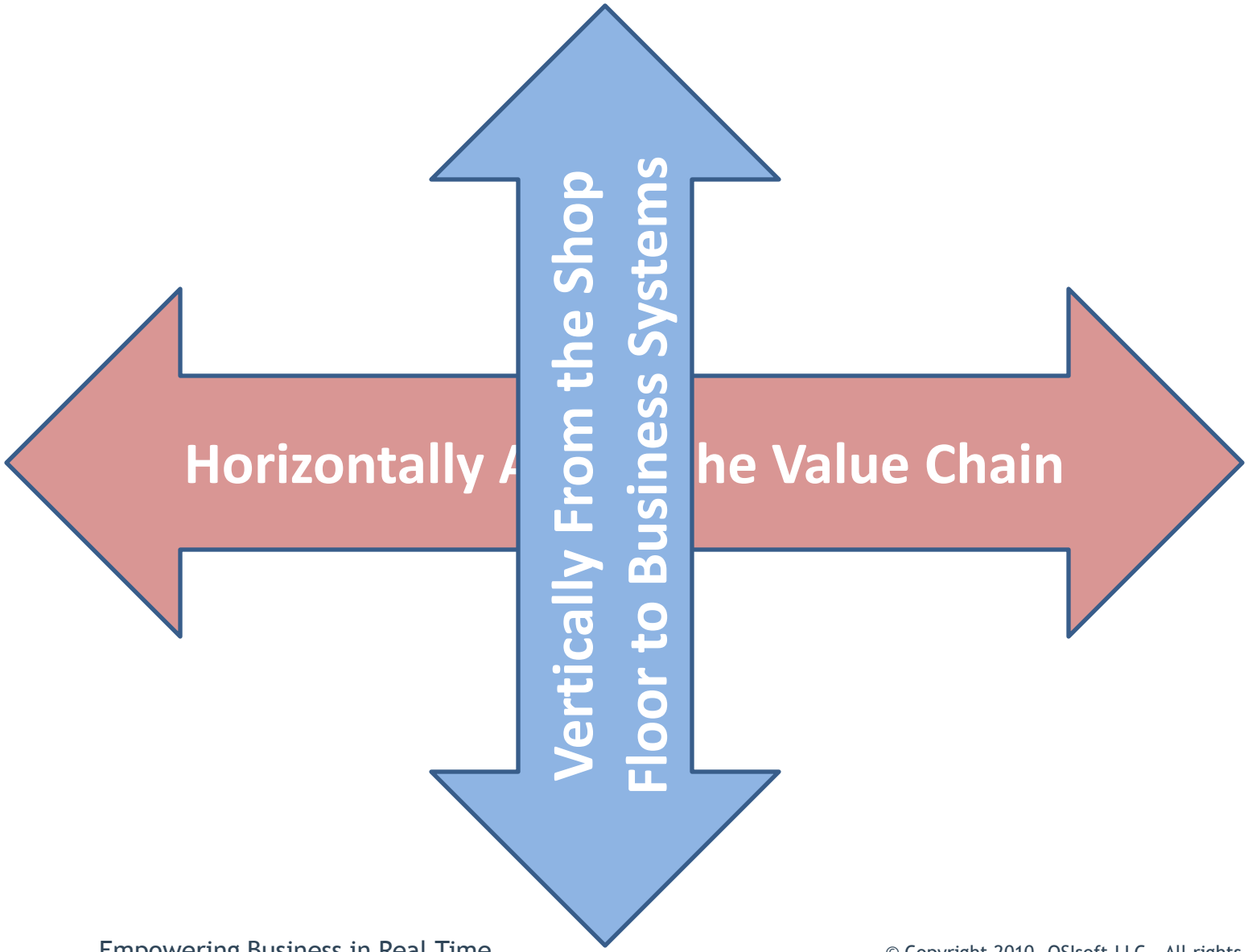
Advanced Real-Time Business Integration



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A PI Infrastructure – Enabling Advanced Real-Time Business Integration

OSIsoft

Operations Monitoring | Energy Management | Maintenance Management (CBM) | Asset Optimization

SAP | maximo | Meridian SYSTEMS

Microsoft



Real time applications

Individual/Organizational Analytics & Visualization With Microsoft Tools

- Real-Time Data
- Batch Data
- Relational Data
- Quality Data
- Manual Data
- Structure/Asset Data
- Web Data
- Applications Data
- Maintenance Data
- ERP Data

VALUE NOW, VALUE OVER TIME

PI SYSTEM

POWERING THE REAL-TIME ENTERPRISE

- ENTERPRISE
- REGION
- Territory
- PLANT
- UNIT
- MACHINE

Across the Value Chain

Across the Infrastructure


Exploration


Production


Gas & Liquid Pipelines


NGL & LNG


Refining


Chemicals

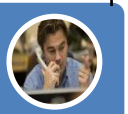

Distribution & Marketing


Alternative Energy


R&D


Data Centers


IT Infrastructure


Trading

1000's of different real-time data sources and associated interfaces that propagate through the automation space

Delta V | ROSEMOUNT Analytical | GE FANUC | FISHER | ABB | Rockwell Automation RSView | Honeywell Plantscape | invensys FOXBORO | ROCKWELL SOFTWARE | TECNOMATIX FACTORYLINK 7.5 | EMERSON | Bailey

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Pertamina's UC2010 Presentation

OSIsoft UC2010

Integrated Downstream Dashboard

Toto Nugroho Pranatyasto
Manager Performance Mgt. & Systems Development
INTEGRATED SUPPLY CHAIN DIVISION
www.pertamina.com

PERTAMINA

Real Time Information — Currency of the New Decade

Empowering Business in Real Time.

Pertamina Downstream

Assets

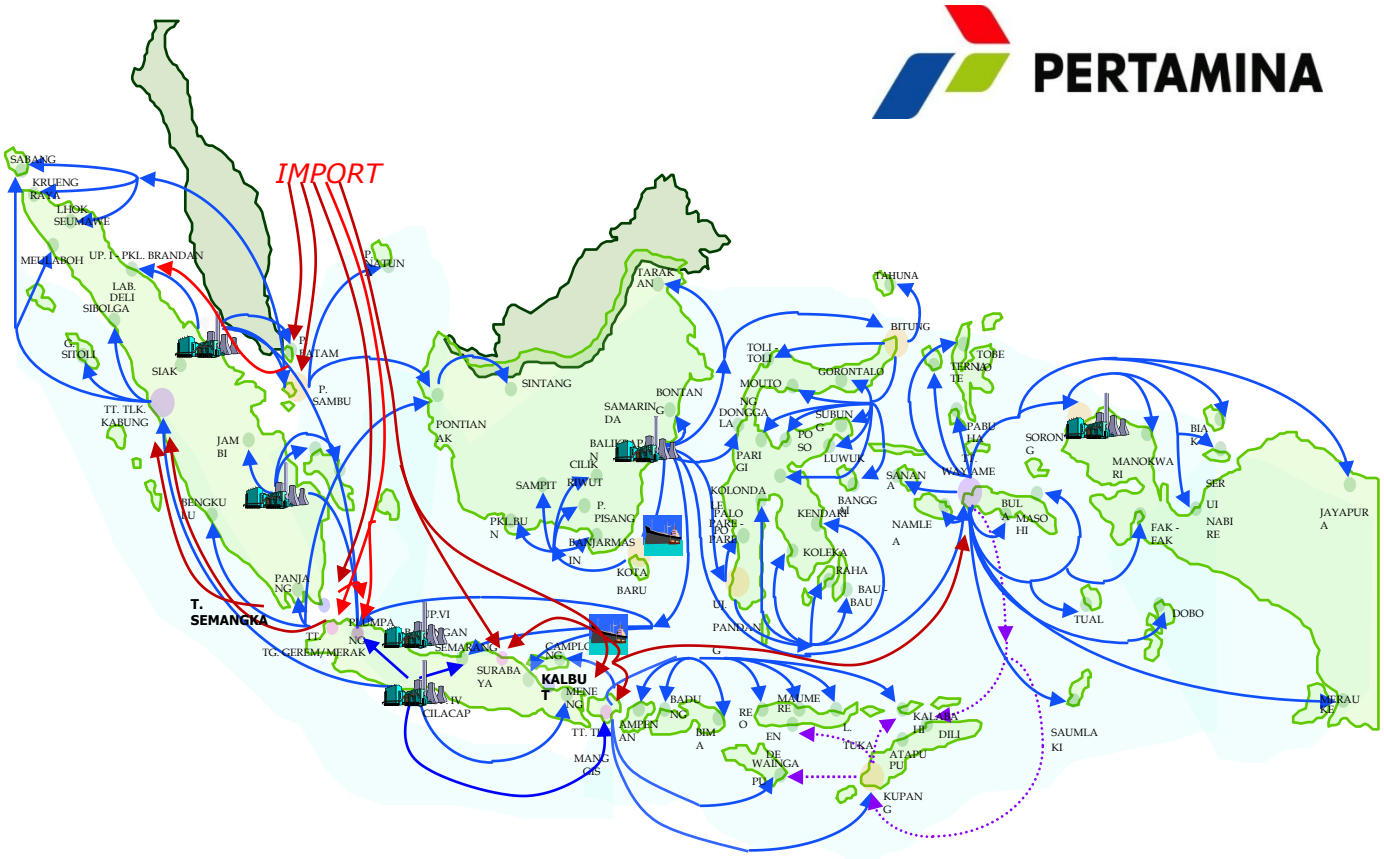
6 Refineries :
1,034 Million bbl/day

120 + Depots

98 Vessels

3,400 Fuel Stations

Sales Volume :
1,200 Million bbl/day
(92 % Market Share)



One of the most complex Downstream Supply Chains in the world

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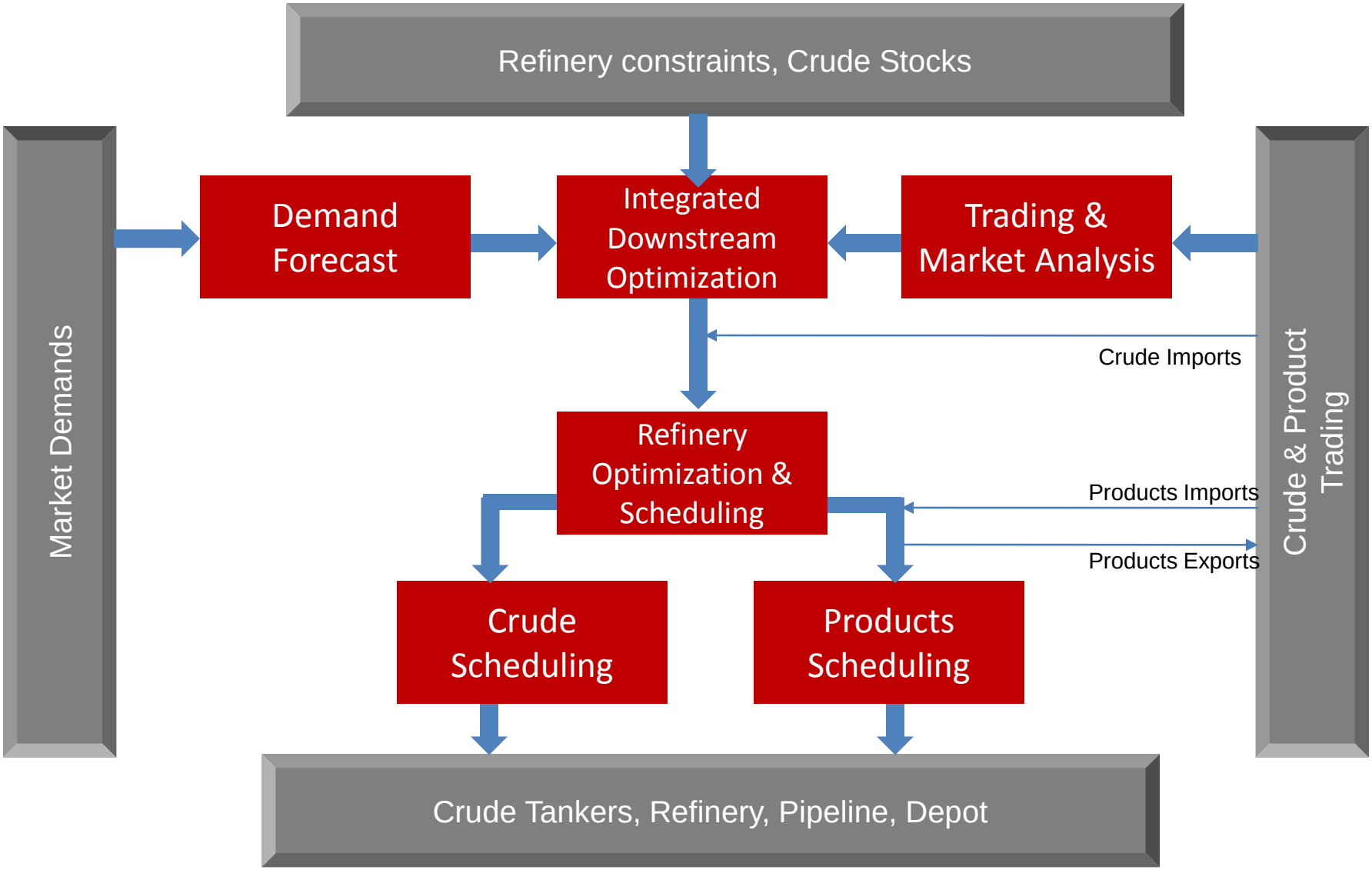
Planning & Optimization Systems



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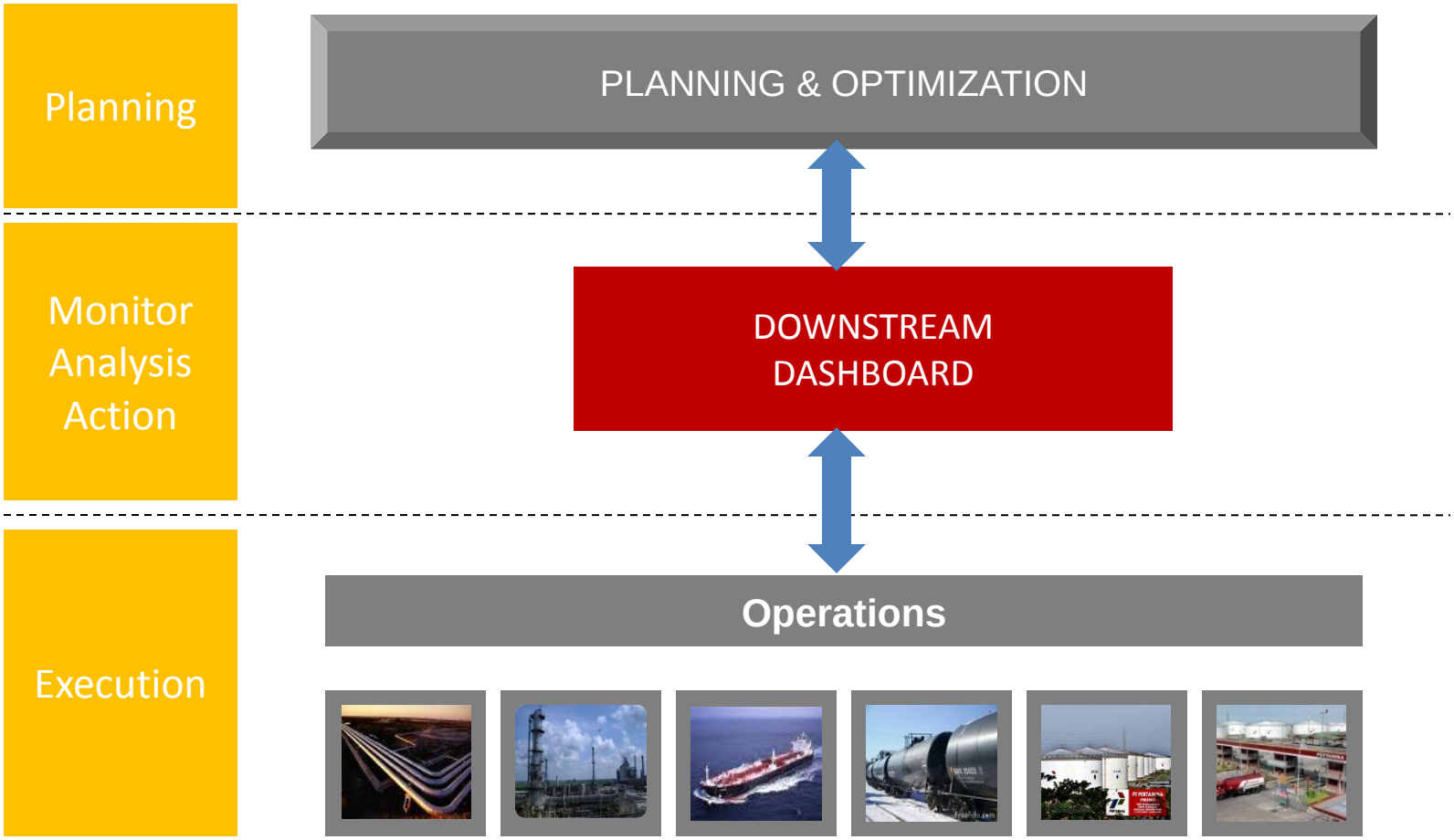
INTEGRATED DOWNSTREAM DASHBOARD



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Integrated Downstream Dashboard

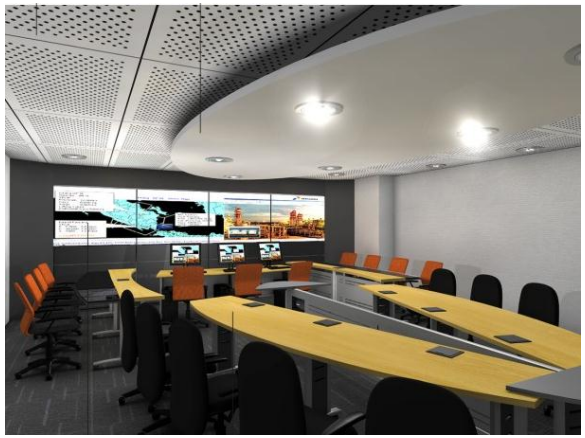
Objectives :

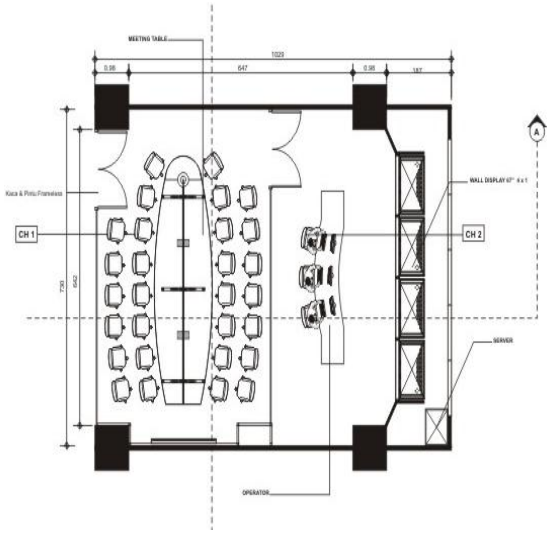
- Consistent single view of entire downstream supply chain.
- Integrated real time data from Crude Purchases to Secondary Distribution.
- Decision making support (normal operations, supply chain disruptions)

Hardware Selection & HQ Control Room Design

Design Objectives

- Single operations room for Refining,Supply ,Shipping & Marketing.
- Ergonomic working environment.
- Direct communication to refineries, vessels and depots.
- Single wall display





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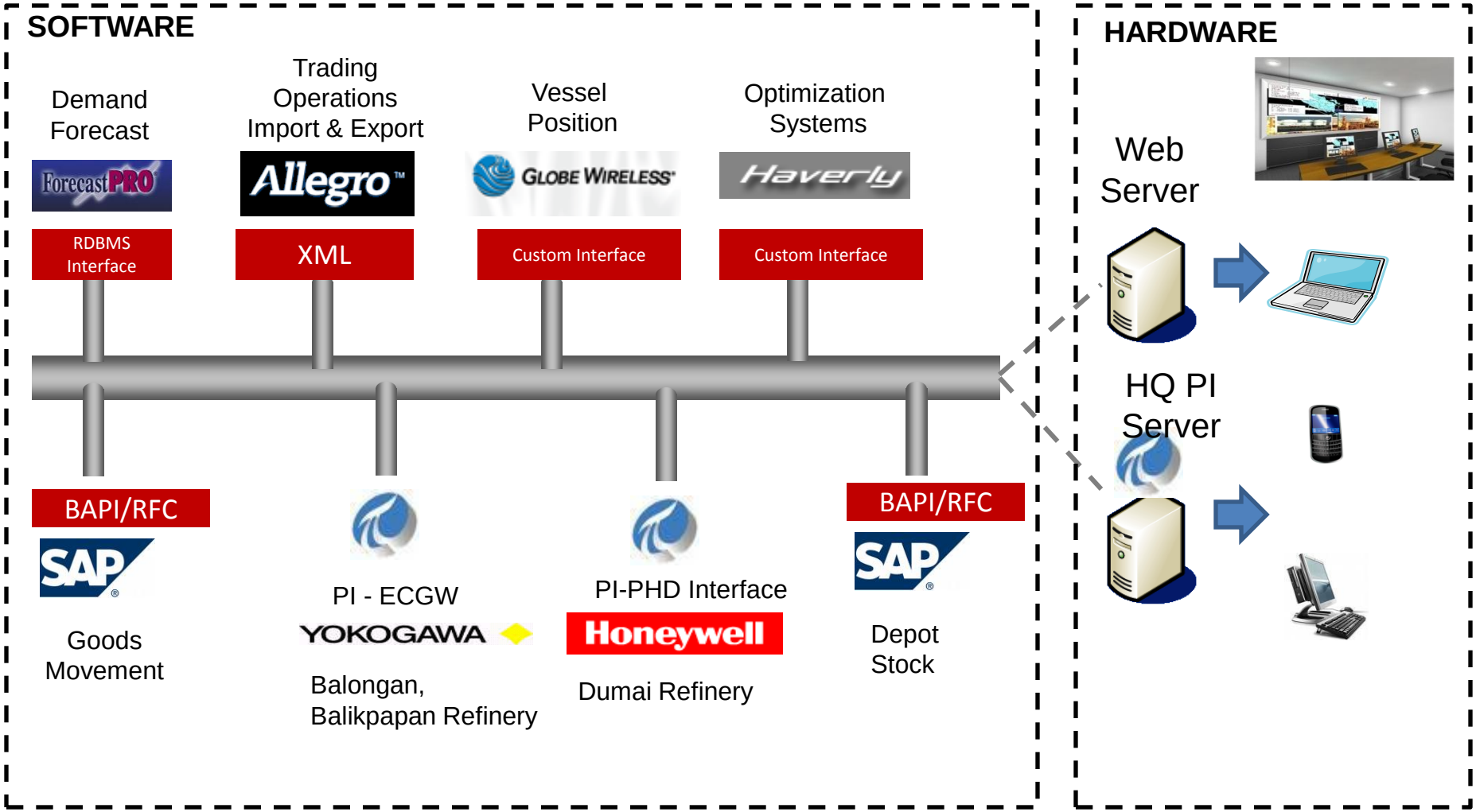
Integration Architecture



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Main Dashboard Display

Objective

- Management view of Entire Supply Chain

Features

- Easy to understand "traffic lights"
- Highlighted items
- Drill down capabilities

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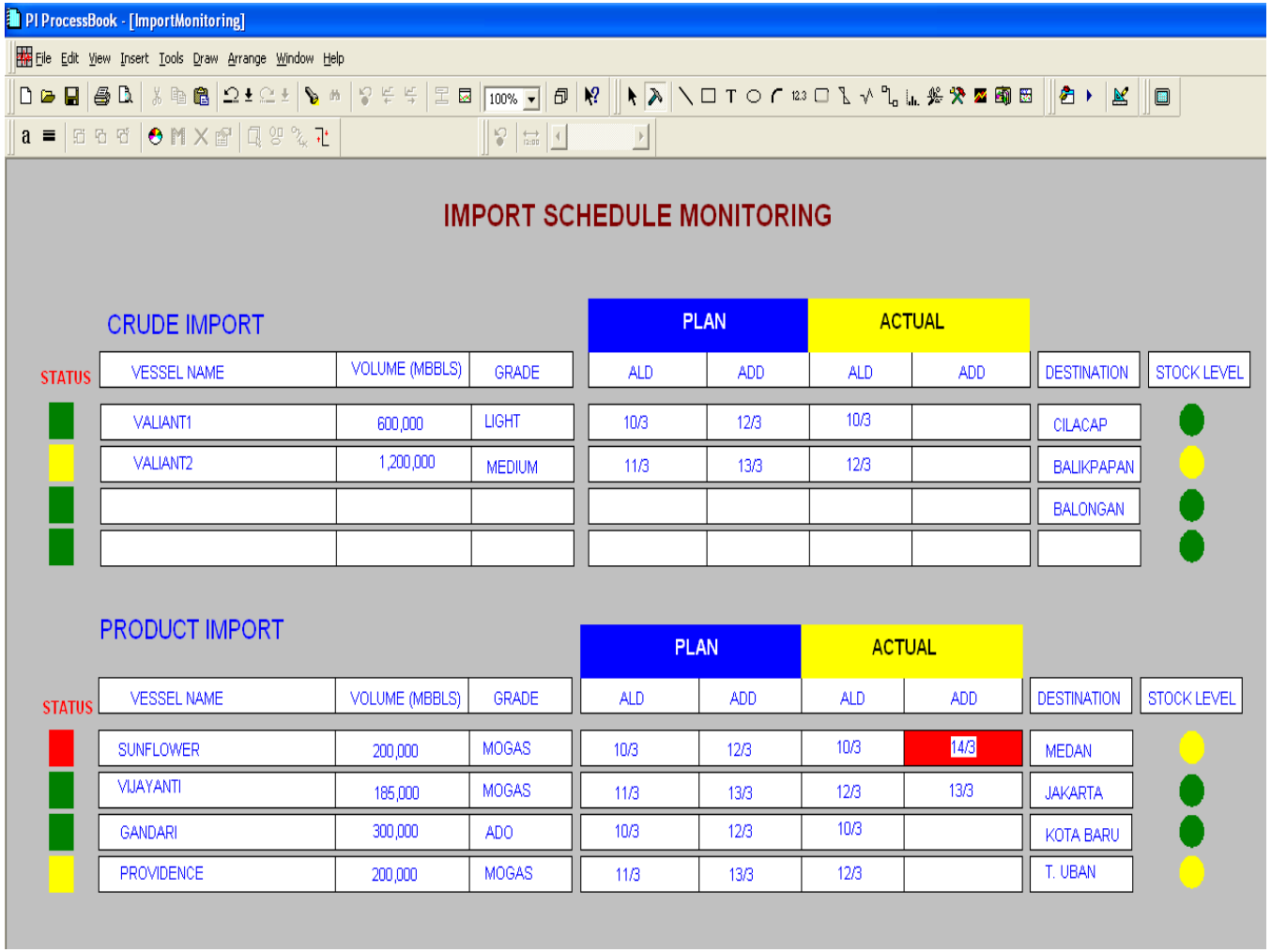
Crude and Product Imports



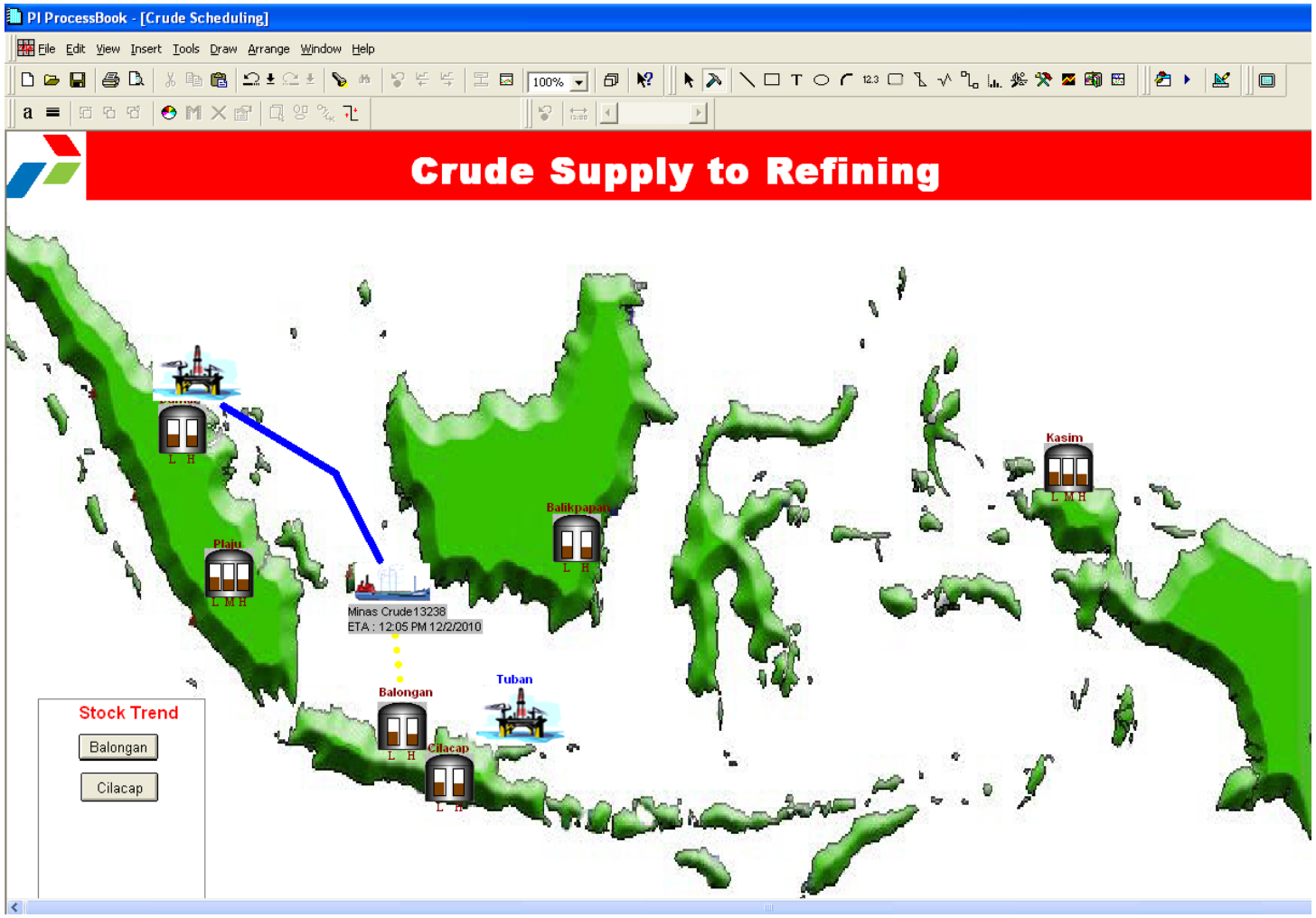
Objective

- Track Crude & Products Imports Schedule

Features

- Tracks ETA of incoming shipments
- Tankage and Jetty Availability
- Summary of committed and pending cargoes

Crude Supply to Refinery



Objective

- Track shipments
- Maintain Crude stock levels

Features

- Plan vs Actual
- Refinery upsets notification
- Vessel alarms

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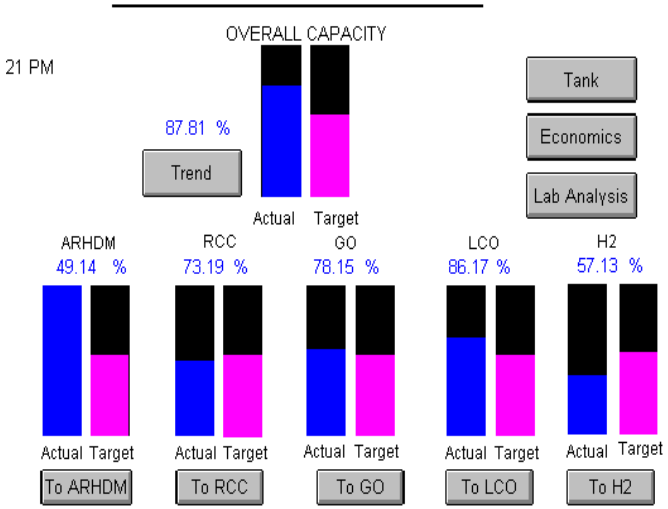
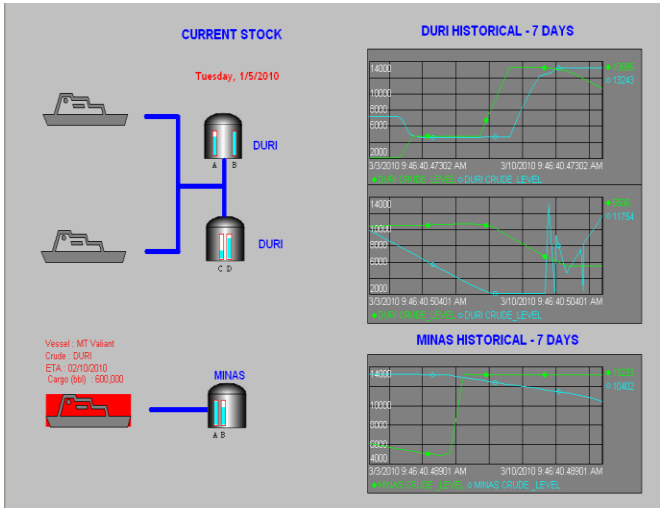
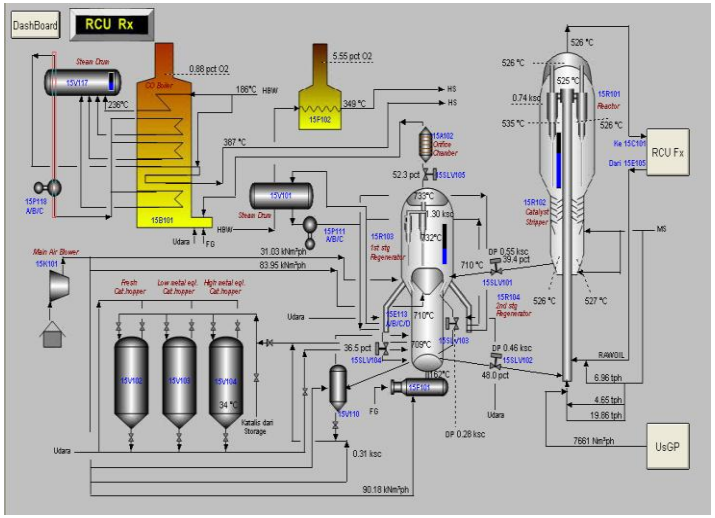
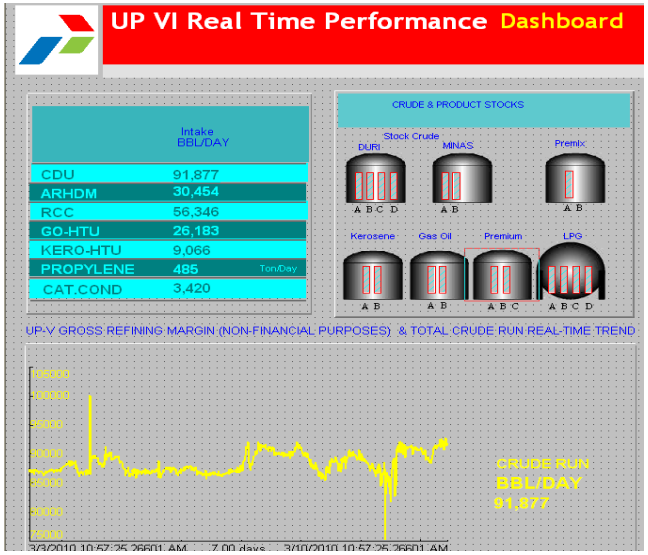
Refinery Operations









Objective

- Real time monitoring refinery operations

Features

- Plan vs Actual Production
- Stock levels of crude and finished products
- Detail DCS level view
- Refinery Problem EWS

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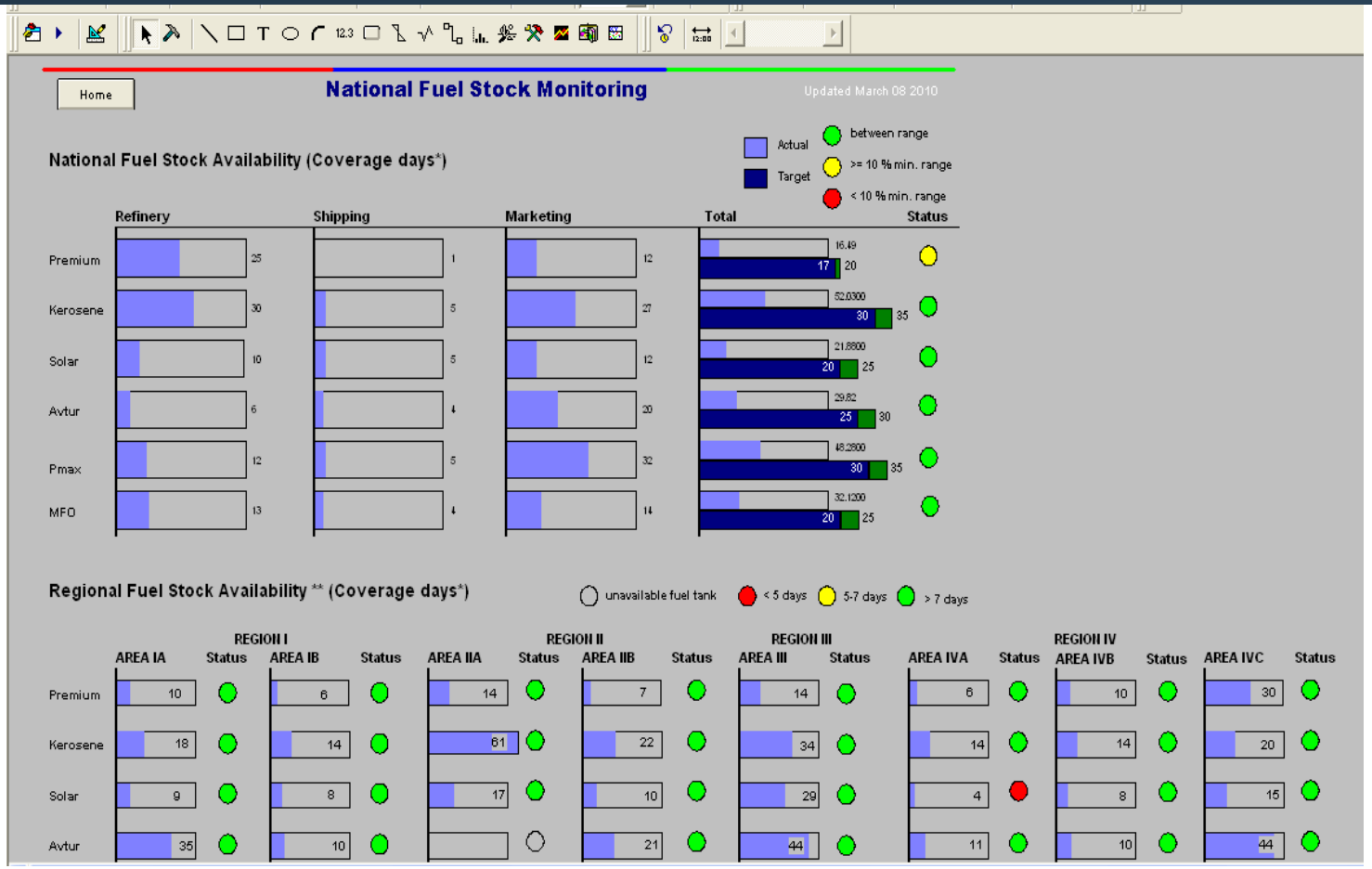
National Stock



Objective

- Maintain National fuel stock levels
- Management View

Features

- Identify potential critical depots
- Actions taken
- Deviation highlights

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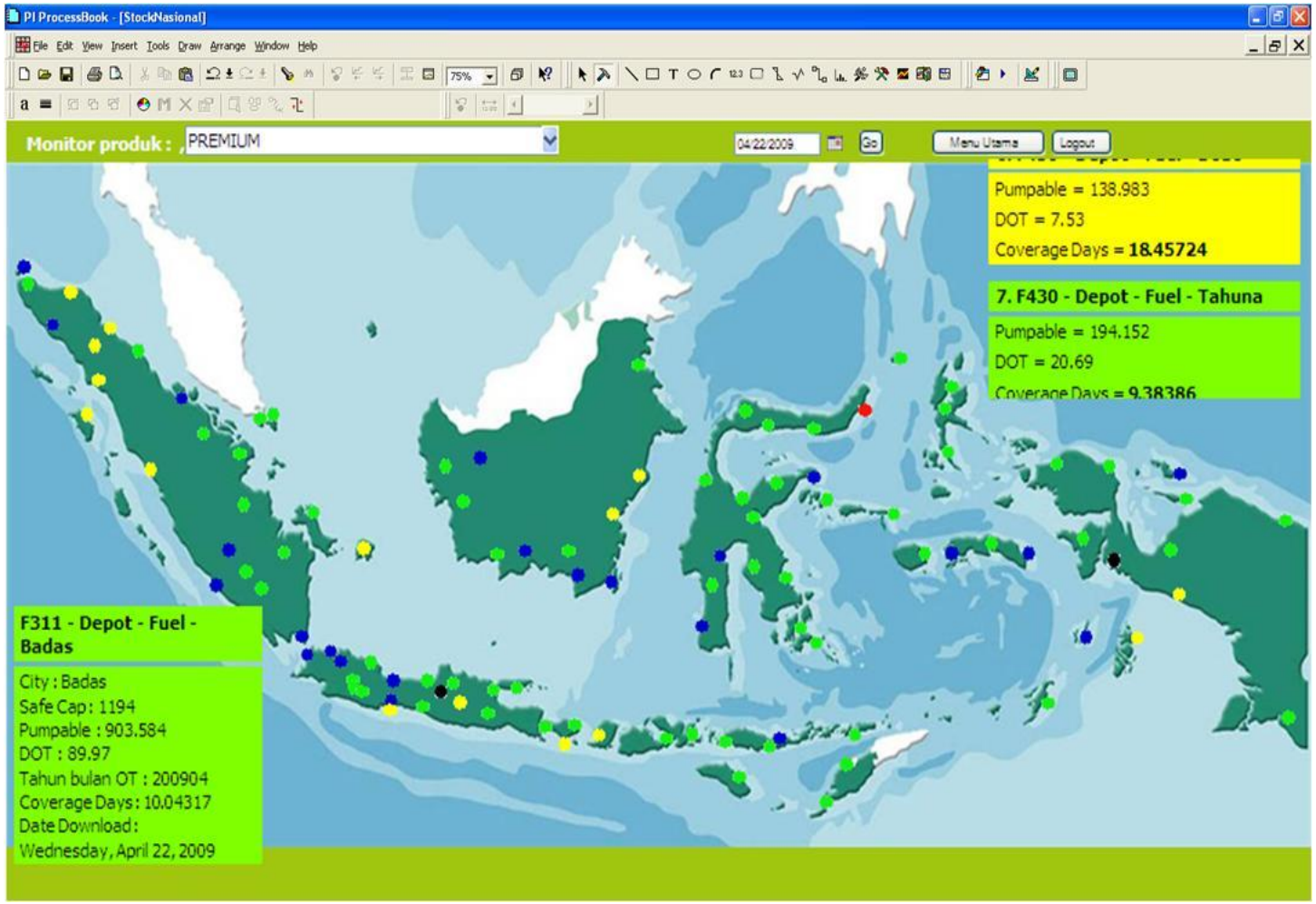
Supply To Marketing



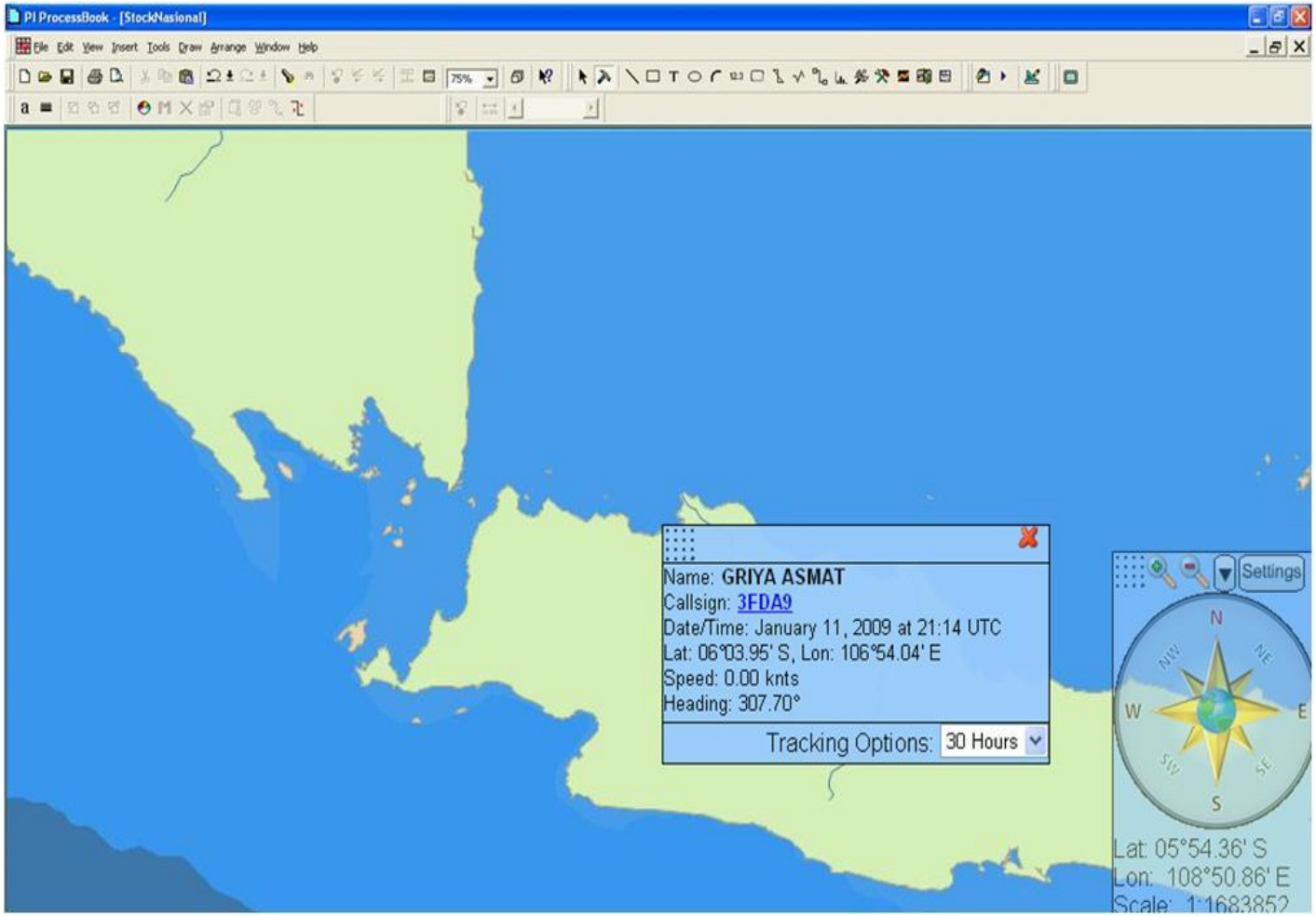
Objective

- Maintain National fuel stock levels

Features

- Identify potential critical depots
- Top 10 critical depots
- Single click to access detail depot data

Vessel Tracking



Objective

- Real time vessel position monitoring

Features

- Track Shipments
- Real time updates of ETA
- Vessel deviation highlights

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SUMMARY – Integrated Downstream Dashboard

	BEFORE - 2007	AFTER - 2009
Working Environment	4 Operating Group, Separate floors	Single floor, in Control Room
Planning process	Functional Silos	Integrated planning and operations from end to end
Data Timeliness	Outdated, not synchronized data	Real time and near real time data
Data Visibility	Limited view of supply chain data	Single coherent view
Monitoring tools	Manual monitoring - Excel	Track plan vs actual through Processbook, Web

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Thank you

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