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JULY 26 - 29, 2011

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Utilization of PI System with Geospatial Reference

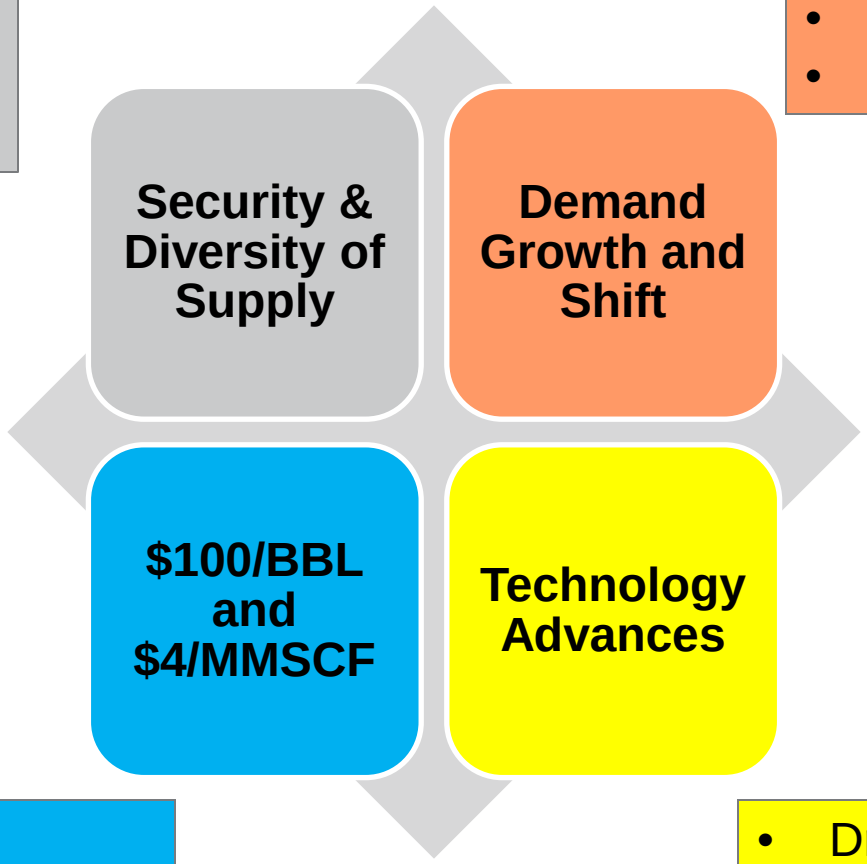
Kelly Sherrill Business Development Upstream Oil & Gas
OSIsoft

Learning Moment

Macro Trends In Oil & Gas

- Major FDI (China)
- E&P expansion
- Shale Gas
- Renewables

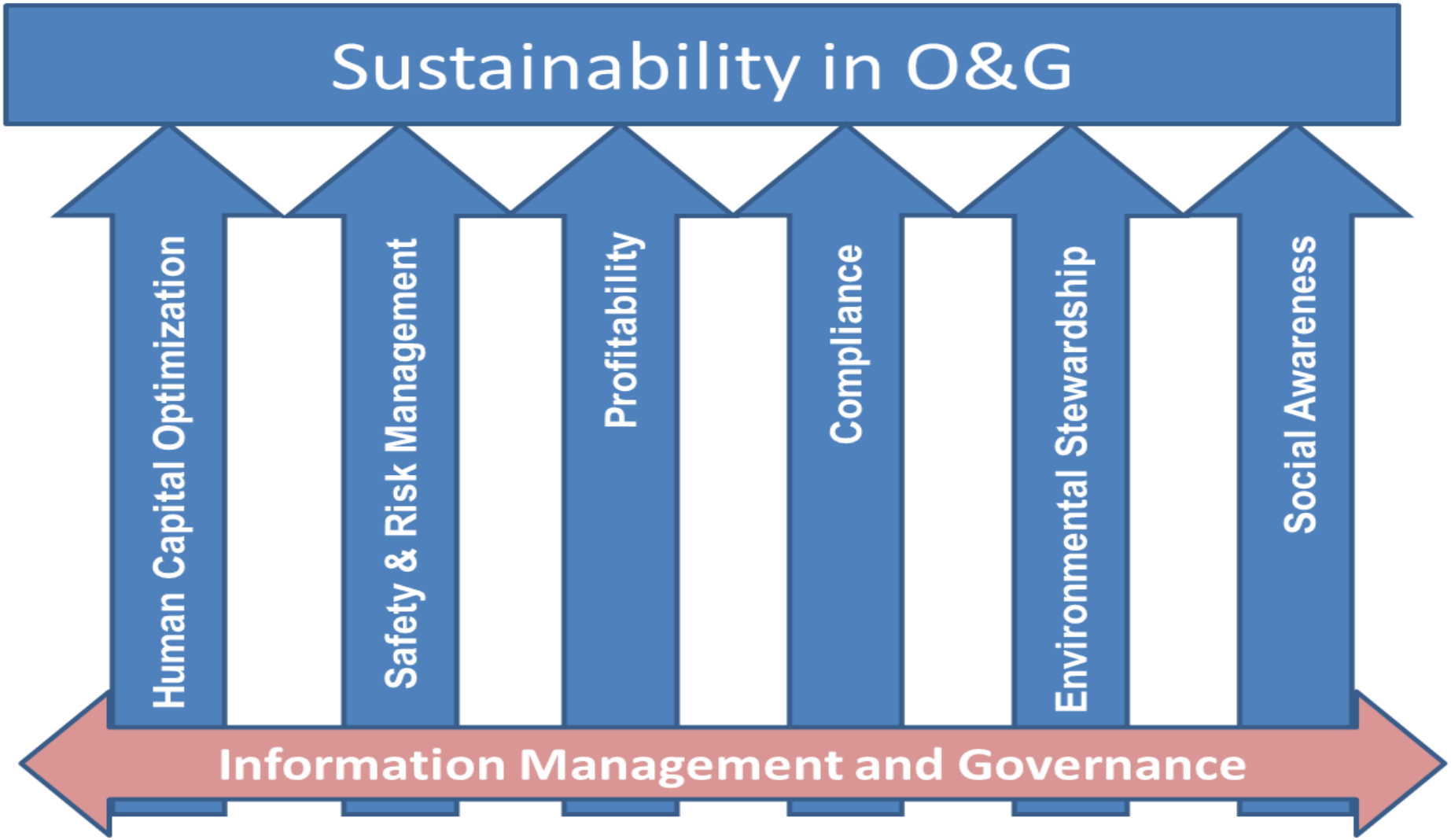
- Growth in BRIC ME/NA
- Demand expansion
- Market Integration



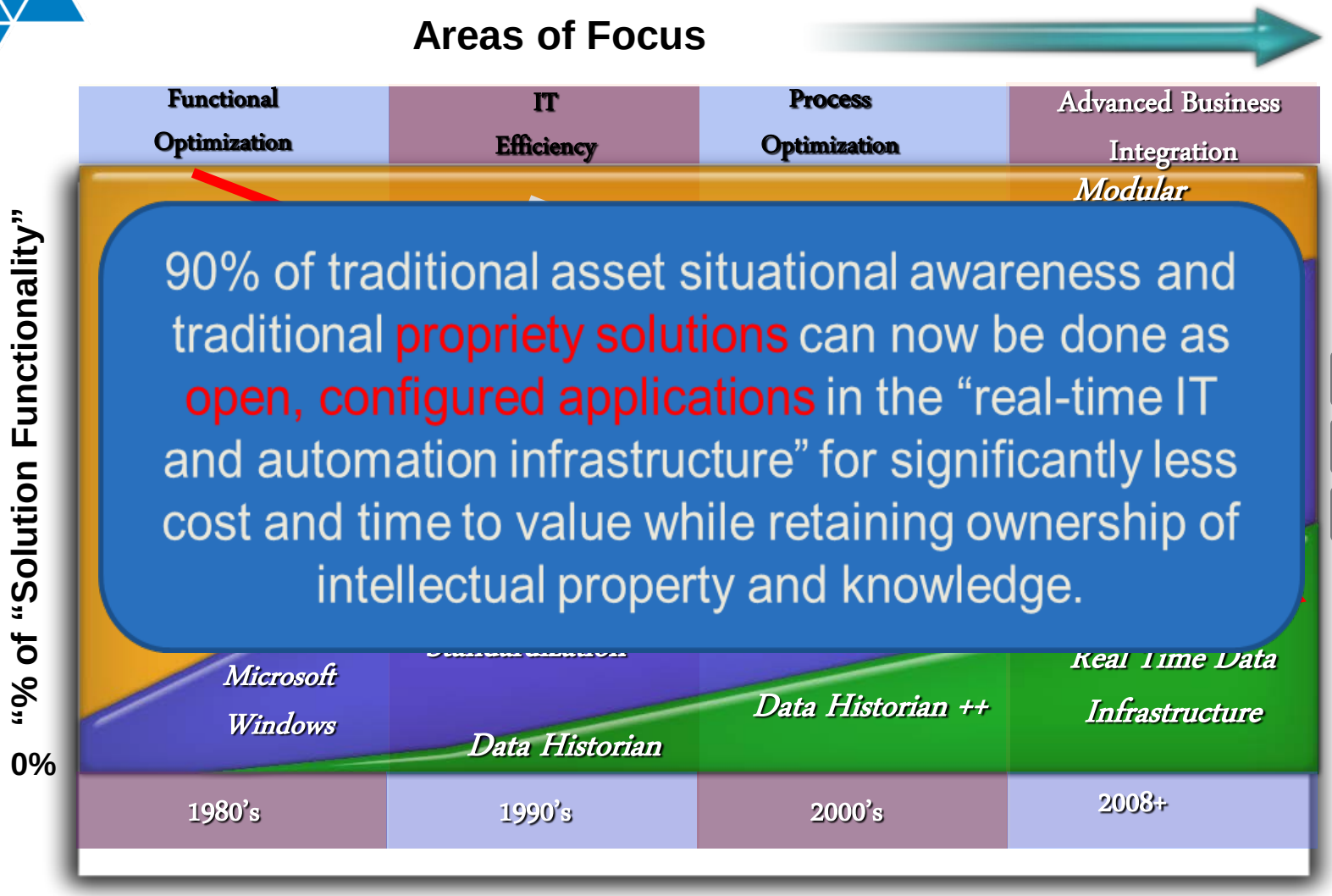
- Drill Baby, Drill
- Shifting Gas markets
- Supply chain integration

- Drilling
- Production
- **Information Technology**

The 7 Dimensions of Corporate Sustainability



Evolution of the Real-Time Infrastructure



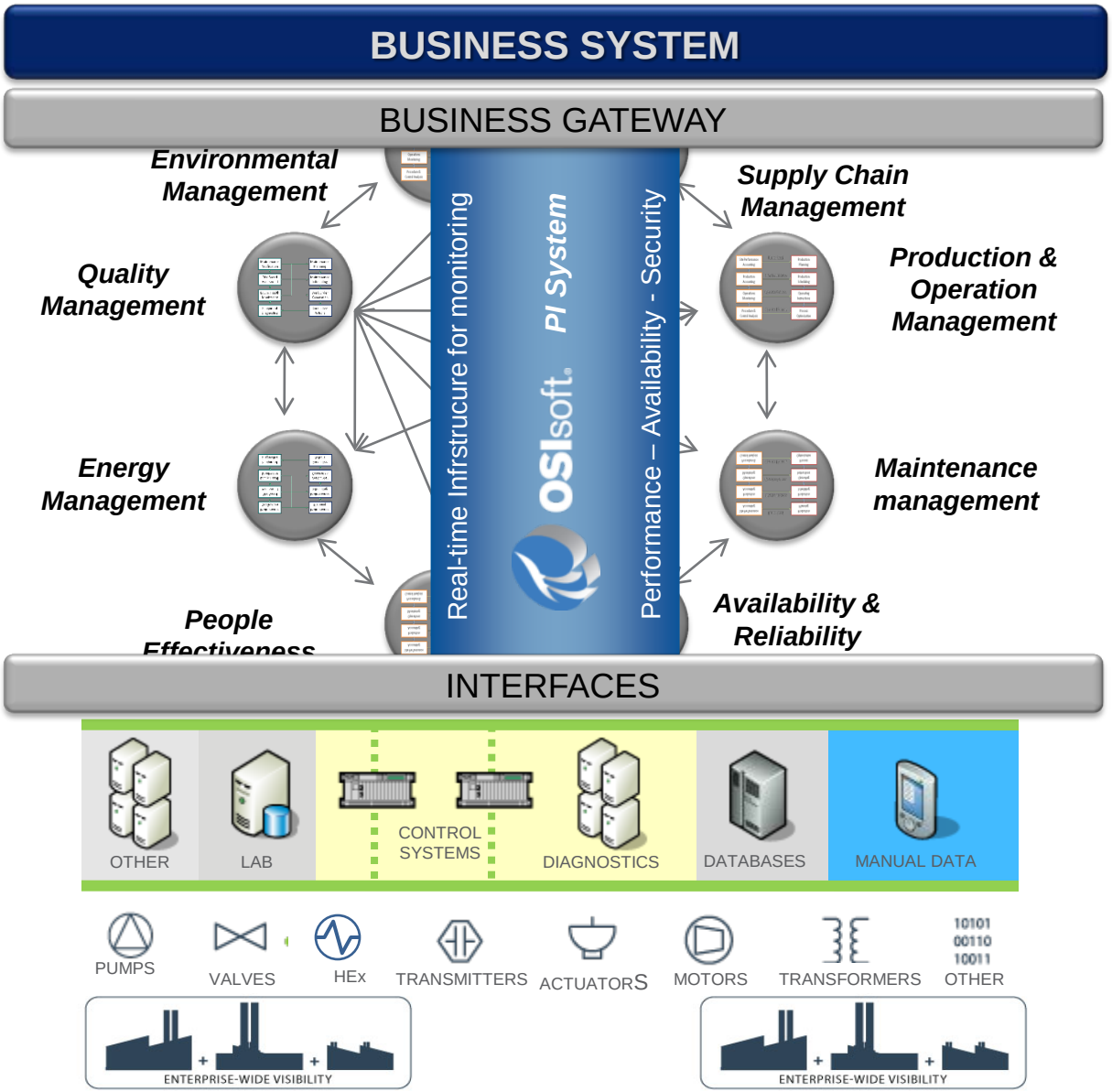
Evolution of the Real-Time Infrastructure

Many Different Applications Across An Organization

MONEY FLOW

INFORMATION FLOW

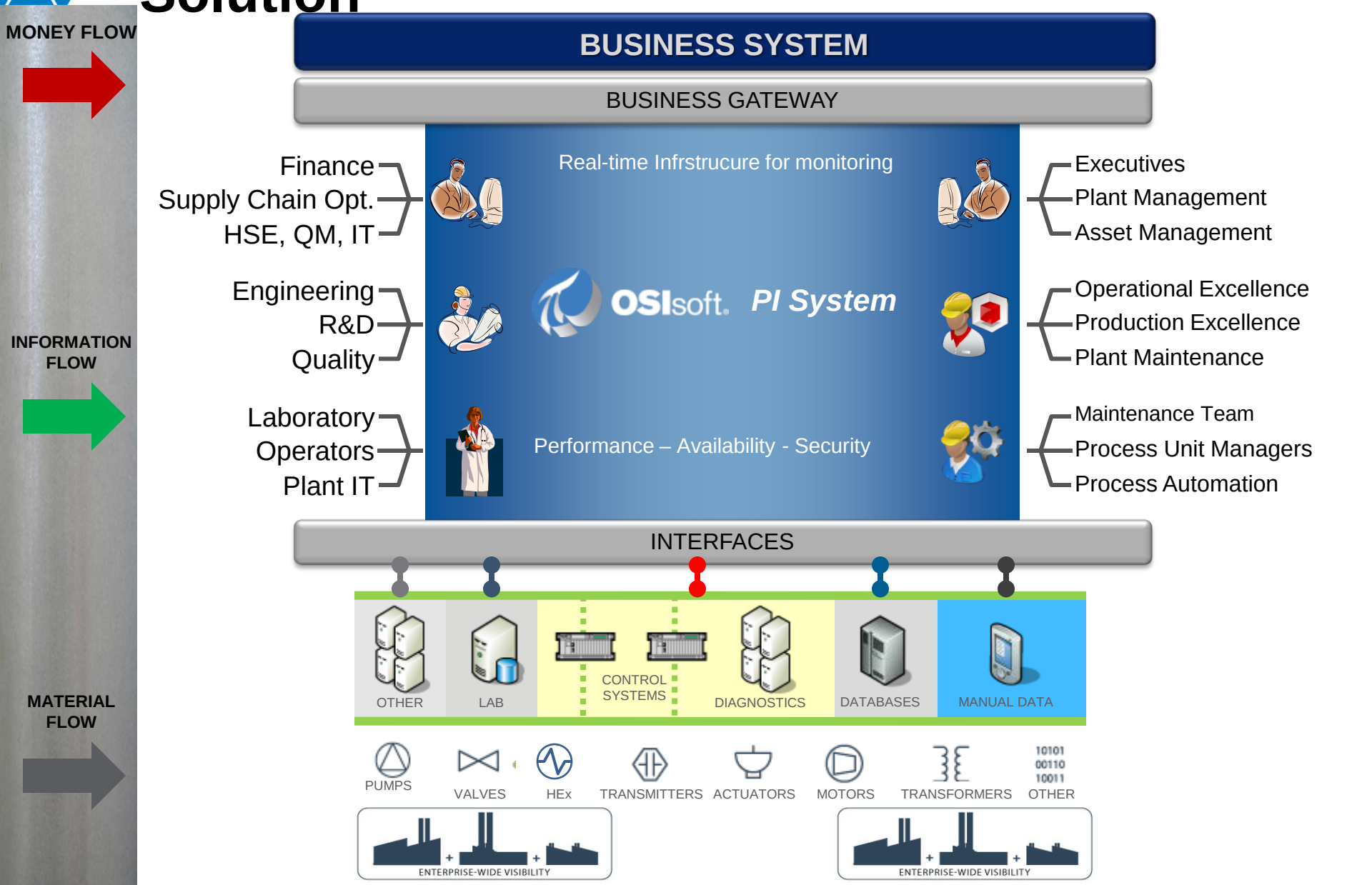
MATERIAL FLOW



Collaboration

Everyone works with the same Information – Rules - Tools

Solution



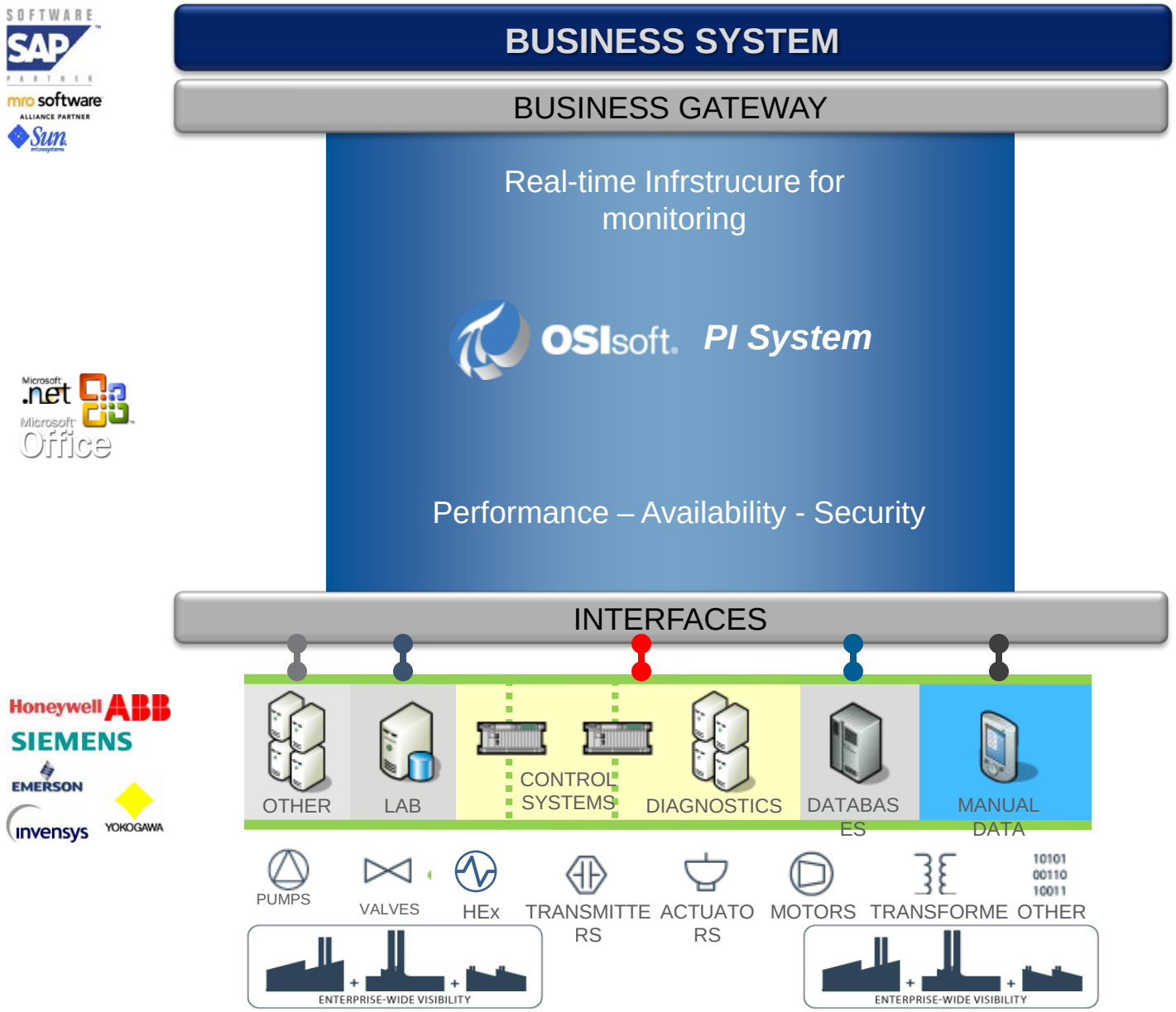
How it is Structured?

Fundamental Layers of PI

MONEY FLOW

INFORMATION FLOW

MATERIAL FLOW



PI System

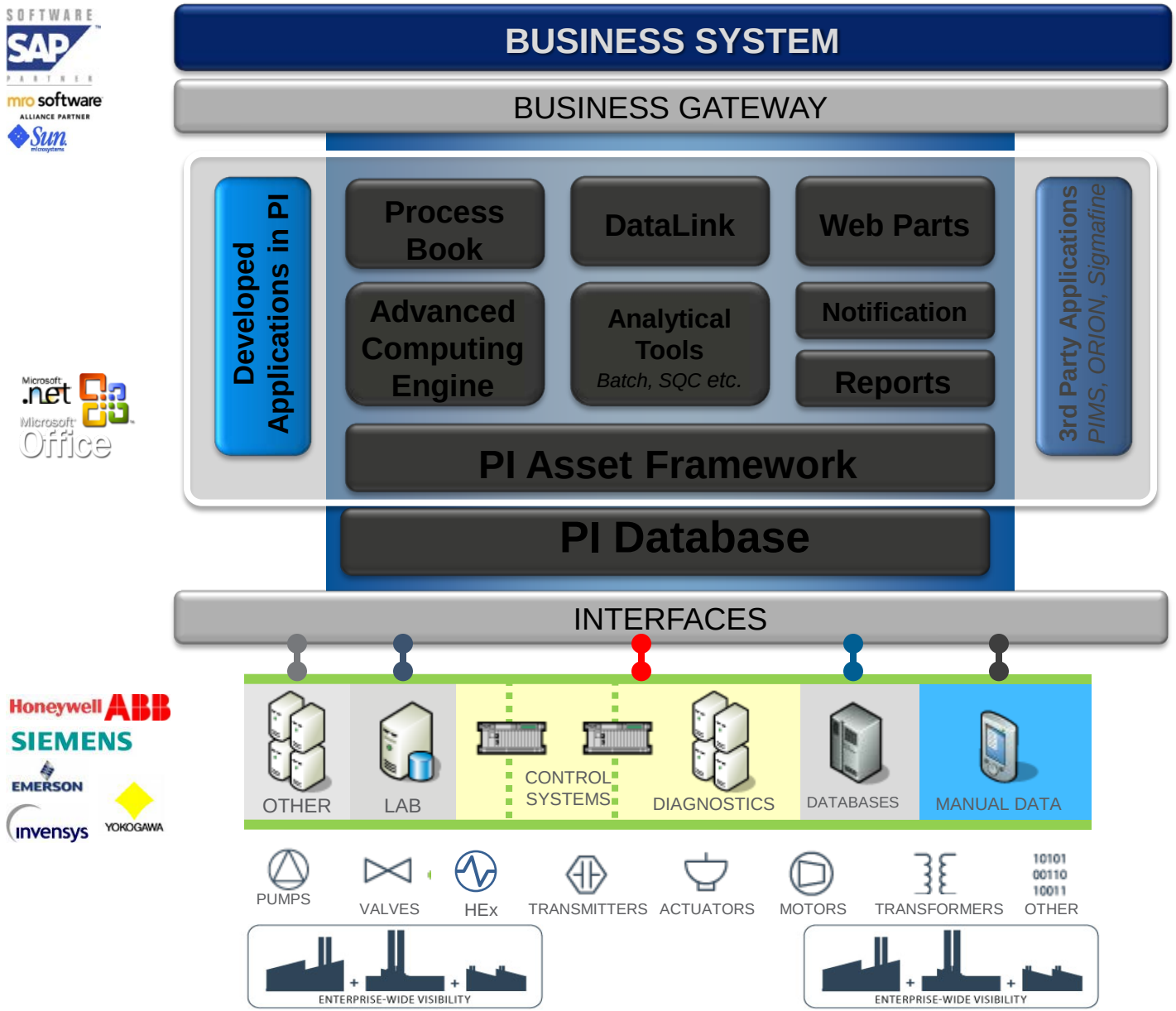
- Present (Visuals)
- Analyze (Analytics)
- Manage (Servers)
- Connect (Interfaces)

How it is Structured?

MONEY FLOW

INFORMATION FLOW

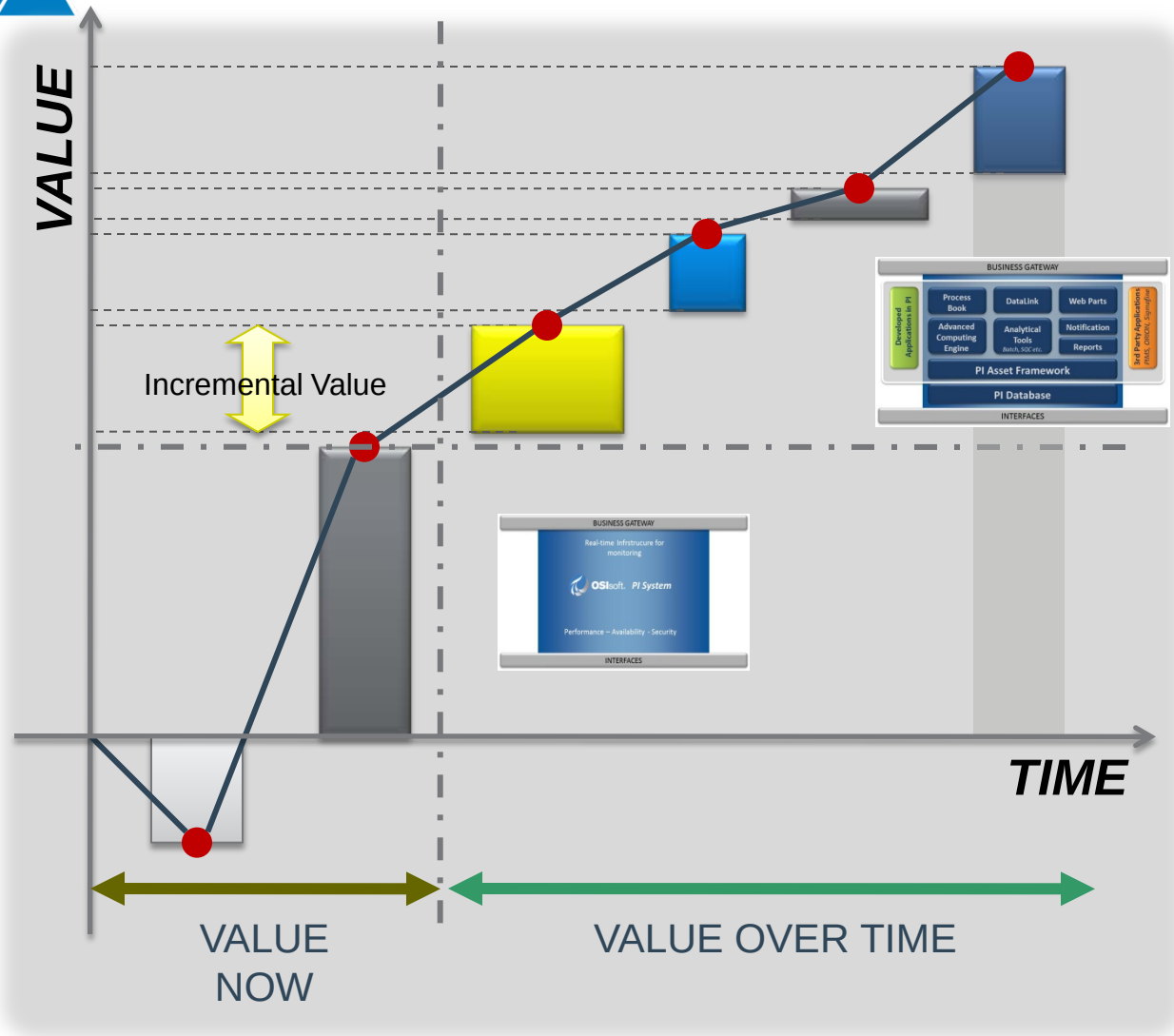
MATERIAL FLOW



PI System

Value Creation Mechanism of PI

Value Now, Value Overtime



Application Benefits

- *Operations Management*
- *Environmental Reporting*
- *Equipment Health Mgmt.*
- *Performance Management*

Infrastructure Value

Initial Investment

Use of PI to Drive Business Value

1. **Value Chain Integtation**
2. **Real-Time Situational Awareness**
3. **Performance Management**
4. **Business Intelligence**
5. **Advanced Collaboration**

PI in Oil & Gas

Upstream (Exploration & Production)

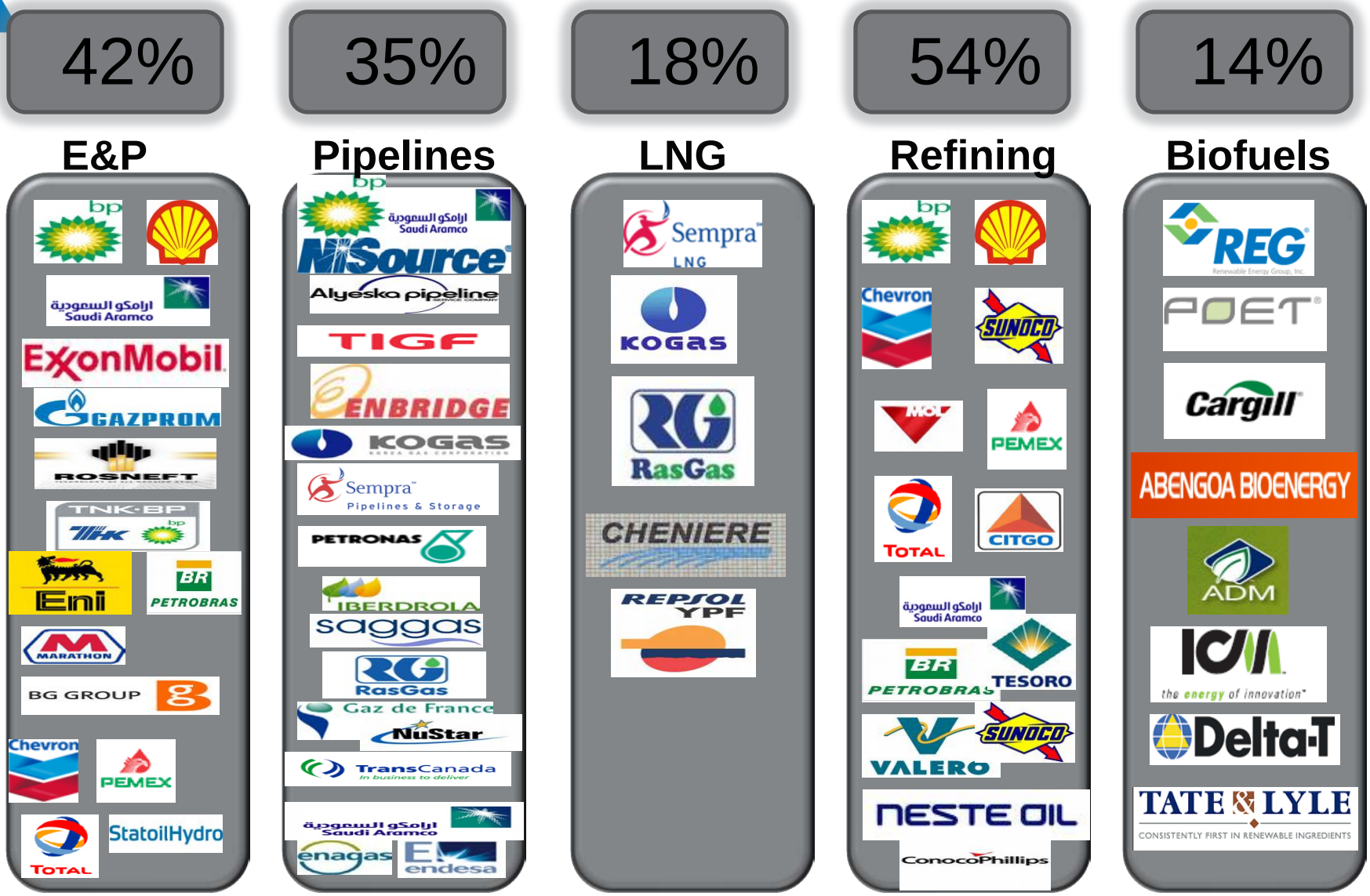
Transportation (Pipeline and Terminals)

LNG – Liquefaction & Regasification

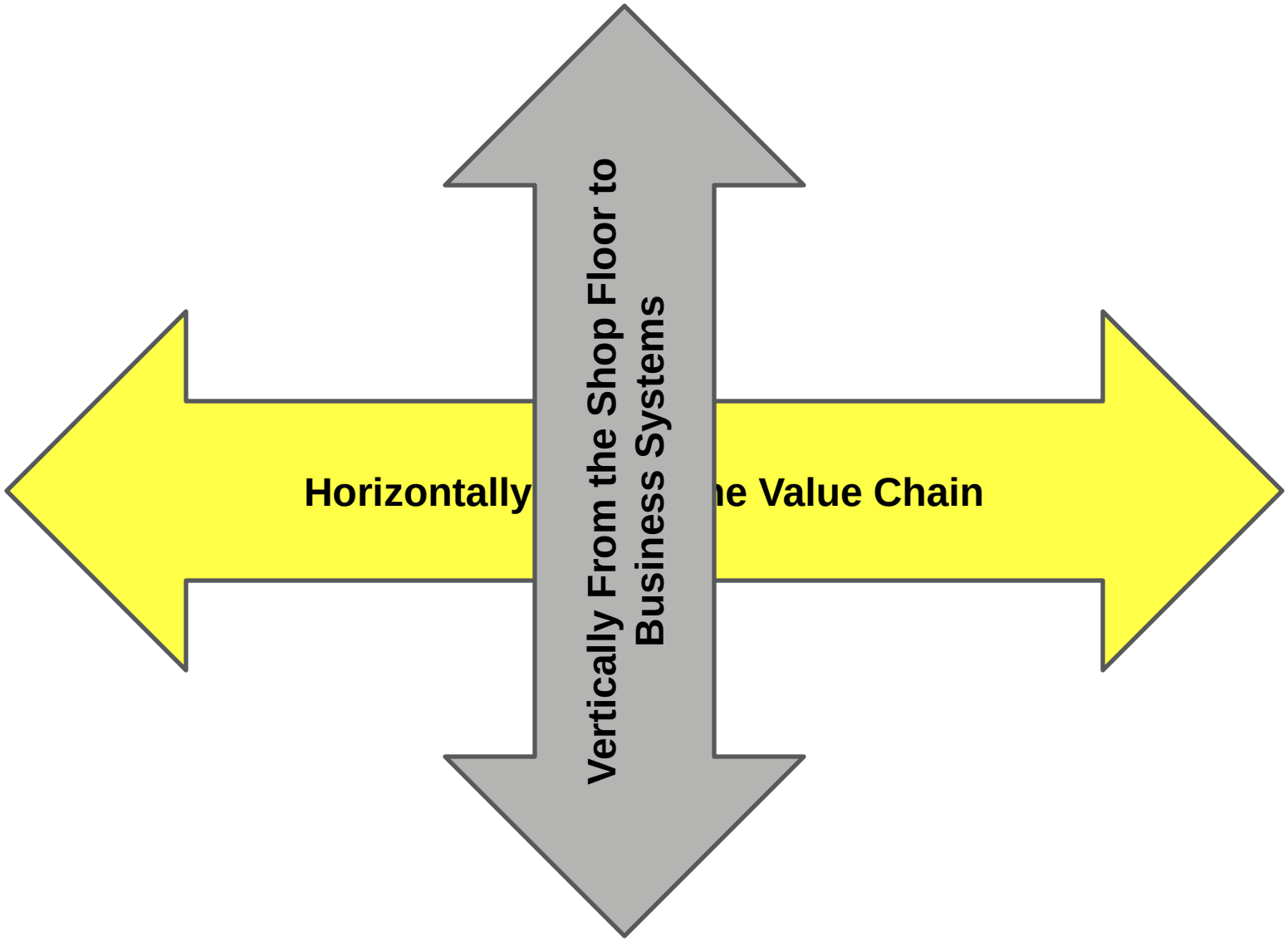
Manufacturing (Refining & Petrochemicals)

Biofuels – Ethanol & Biodiesel

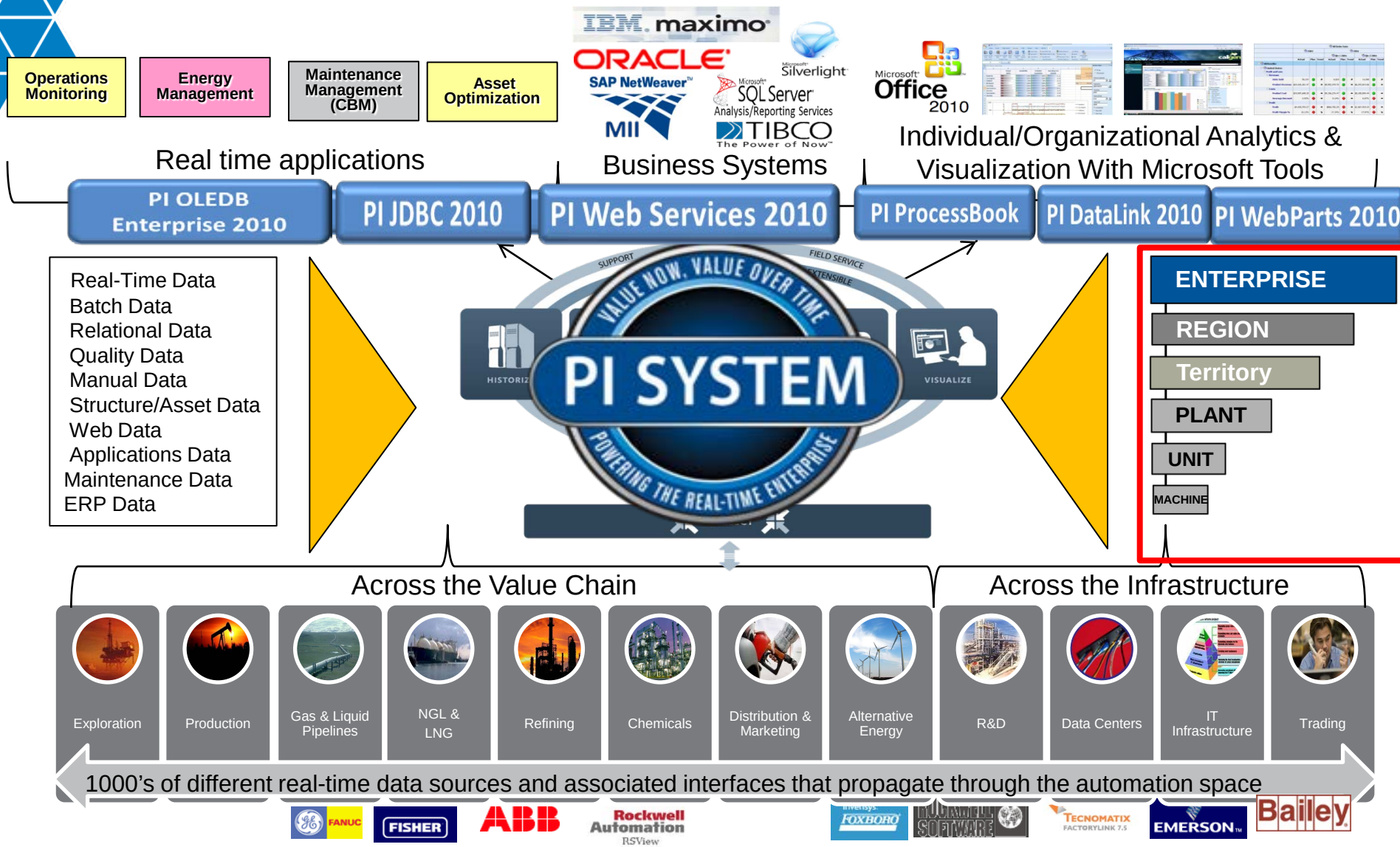
Leveraging the PI System to Respond to Industry Challenges
-% of Global Capacity Using the PI System-



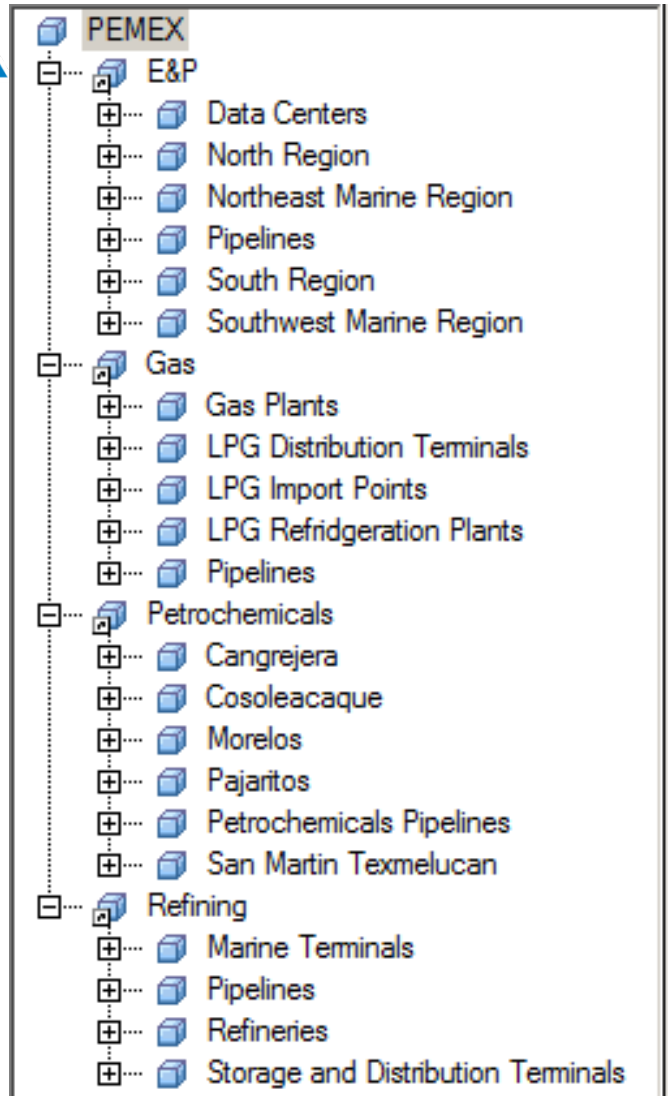
Advanced Real-Time Business Integration



Value Chain and Advanced Business Integration



Example of an Enterprise Asset Hierarchy



- Organizes data from multiple PI Systems from across all business units.
- Simplifies user access to PI data for analysis.
- Provides structure for scalable deployment of ProcessBook displays and PI Web Parts pages in SharePoint 2010.
- Provides association of real-time data with assets required for Operational Intelligence analysis.
- Provides structure to support asset performance rules and notification.
- Provides Data Security

Pertamina Value Chain

Assets

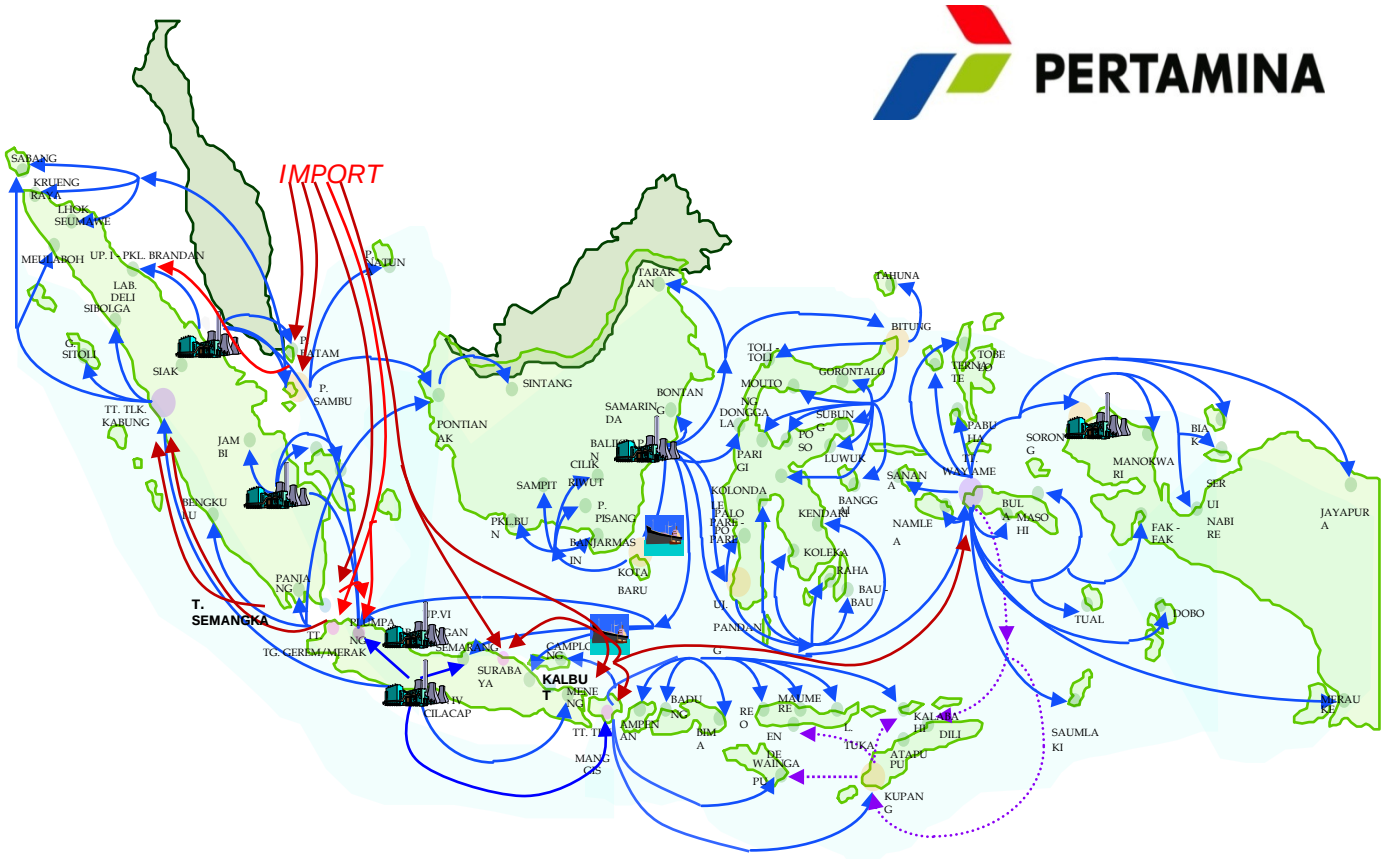
6 Refineries :
1,034 Million bbl/day

120 + Depots

98 Vessels

3,400 Fuel Stations

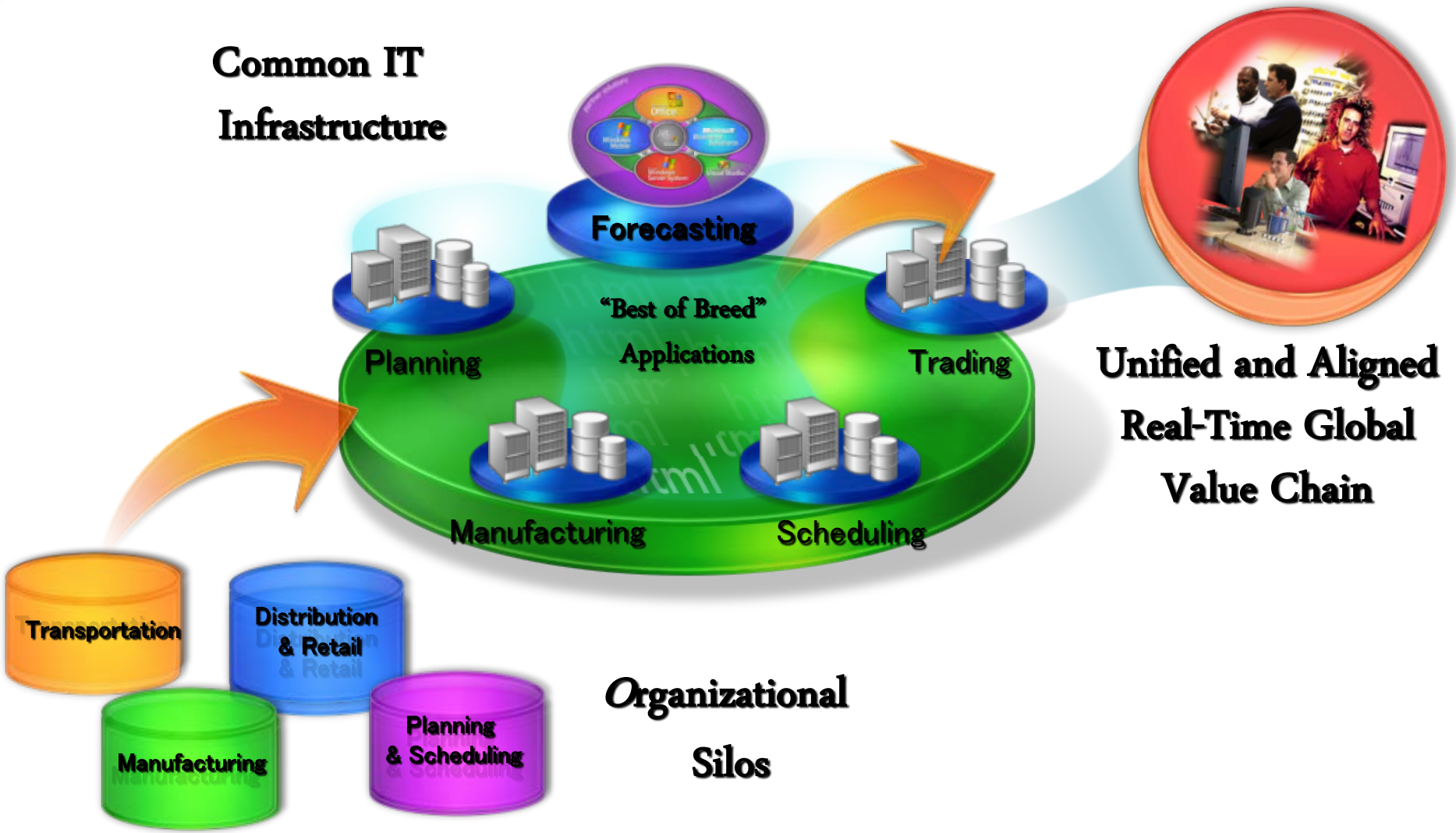
Sales Volume :
1,200 Million bbl/day
(92 % Market Share)



PERTAMINA

One of the most complex Downstream Supply Chains in the world

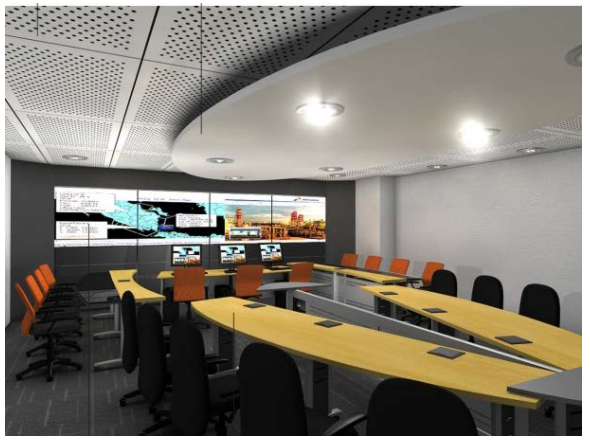
A Real-Time Infrastructure is Key to Global Value Chain Situational Awareness

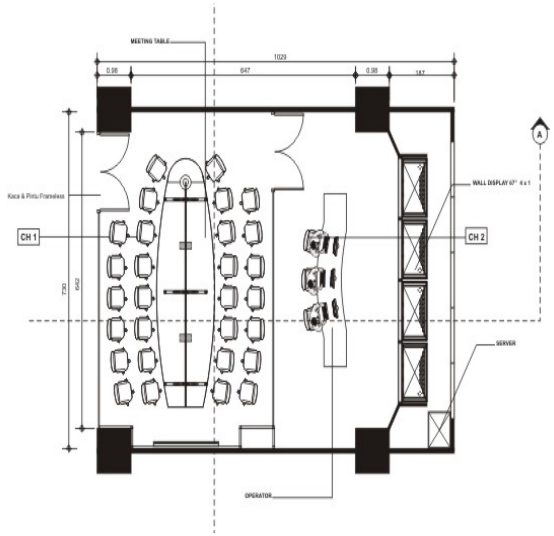


Dashboard– Driving Business Value

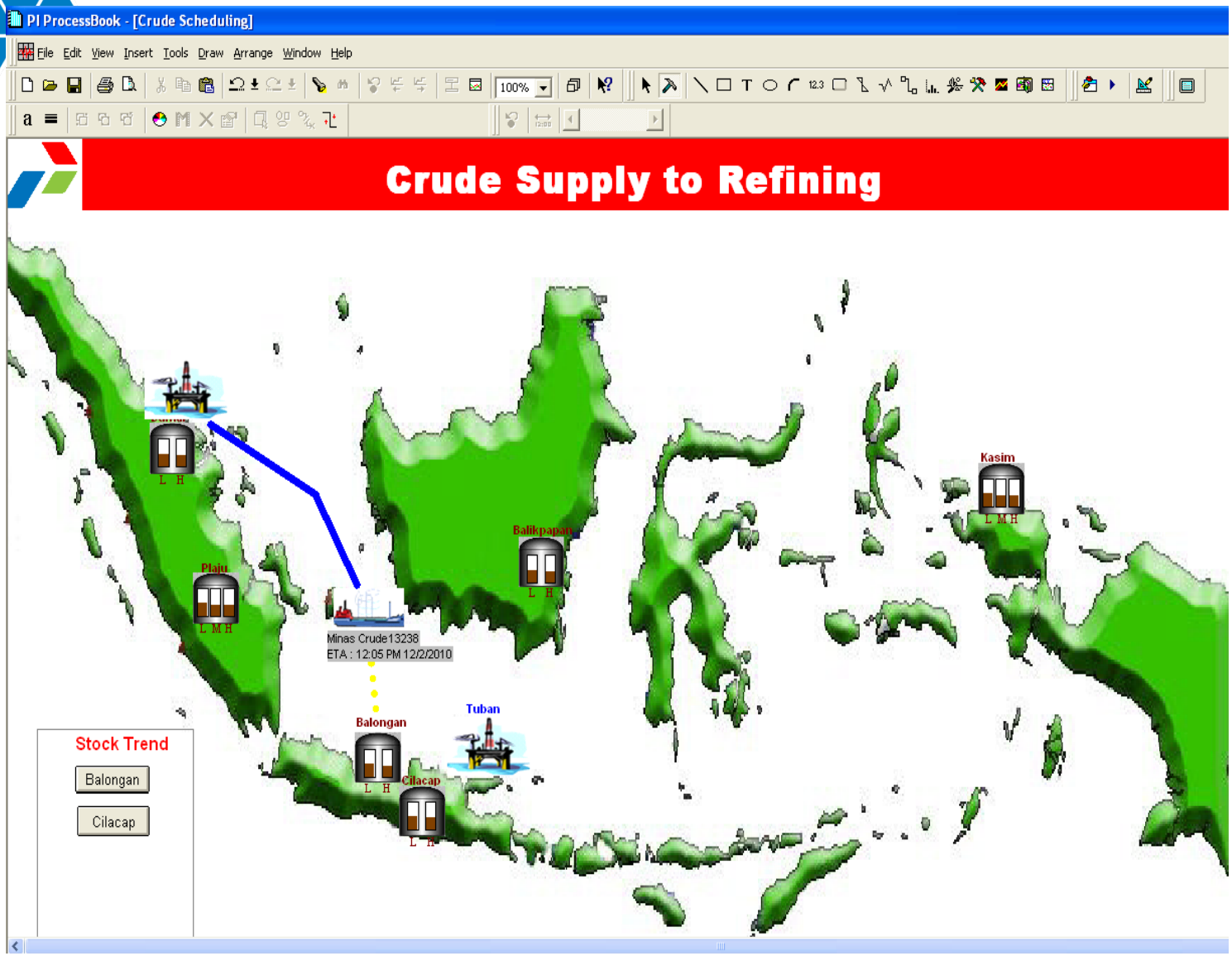
Design Objectives

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





Crude Supply to Refinery



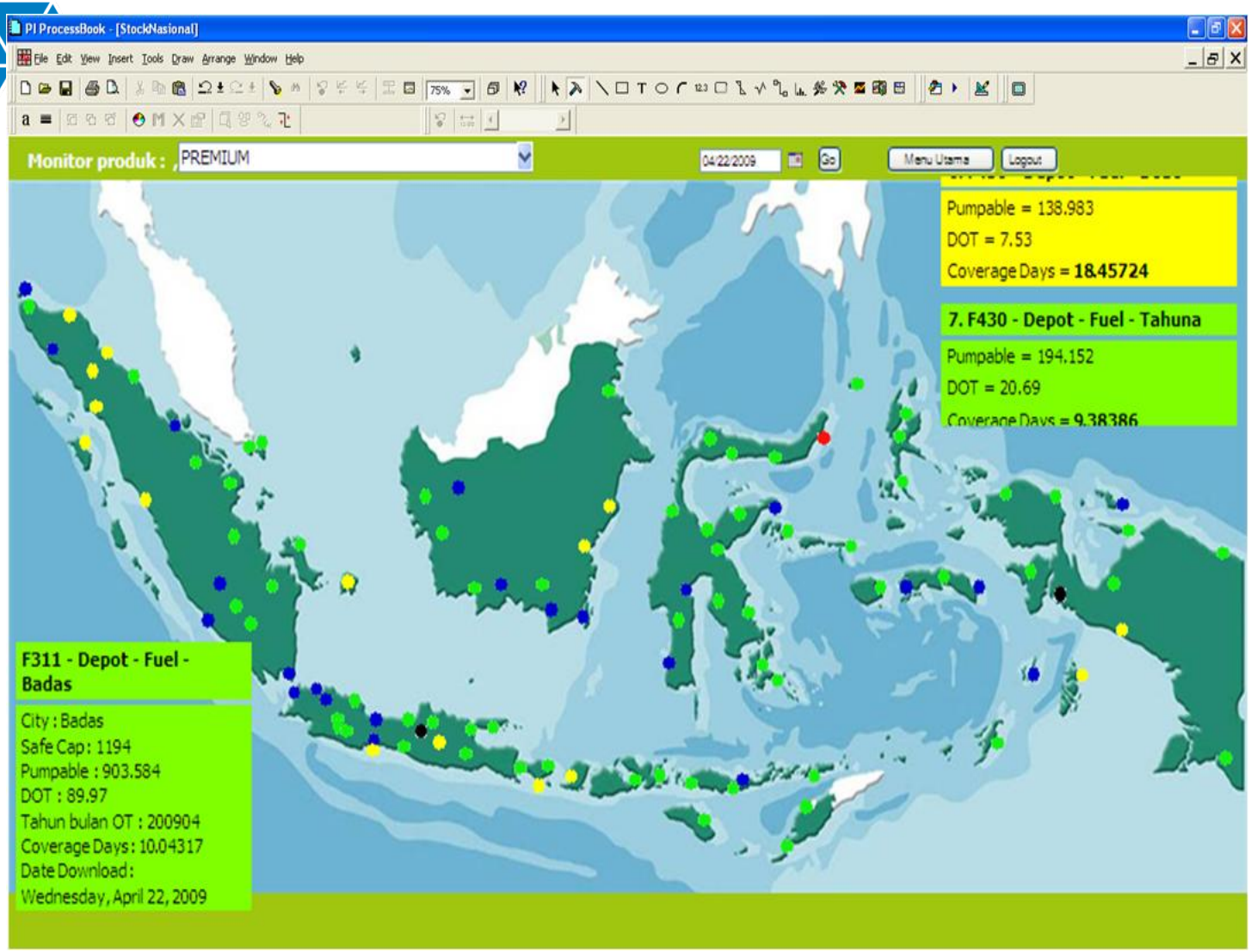
Objective

- Track shipments
- Maintain Crude stock levels

Features

- Plan vs Actual
- Refinery upsets notification
- Vessel alarms

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

Real Time Supervision of a Gas Pipeline

Gasoducto AtacamaCertificación ISO 9001 - ISO 14001

GASATACAMA

Overview

•The 800+ miles GasAtacama Pipeline goes from northern Argentina to northern Chile, through the Atacama desert and the Andes mountain range, reaching altitudes over 16,000 feet.

• Very difficult access to the pipeline locations, adverse climate conditions and the need for secure and controlled operations is accomplished through a remote control and supervision system based on satellite telemetry.

•The operation area is home for the largest copper mines and it holds the largest copper, lithium and nitrates reserves in the world.
•GasAtacama Pipeline owners are Endesa, Chile (50%) and CMS Energy, USA (50%)

•Gas supply is from Argentine producers, YPF and Pluspetrol, from Nor-West Basin under long term agreements
•www.gastacama.cl

Pipeline system

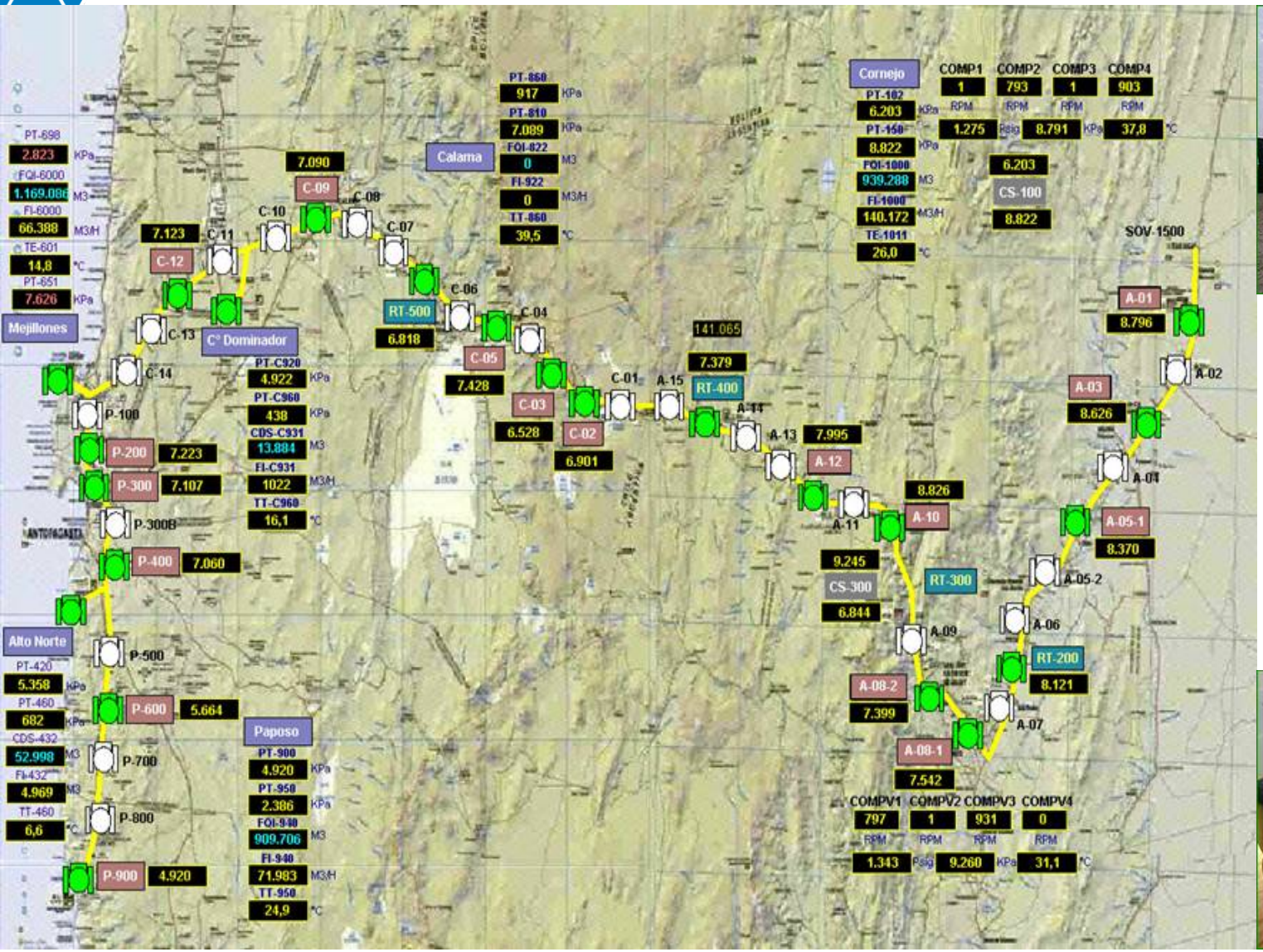
Main Pipeline

- From Cornejo (Argentina) to Mejillones (Chile)
- Length: 951 km 20“ pipe
- 2 compressor stations
- Current Capacity 5.4 million scm /day
- Maximum Capacity 8.5 million scm /day

Taltal pipeline

- From Mejillones to Taltal power plant
- Length: 223 km, 16“ and 12“ pipe
- Maximum Capacity 2.2 million scm /day

Overview Transmission Gas Pipeline



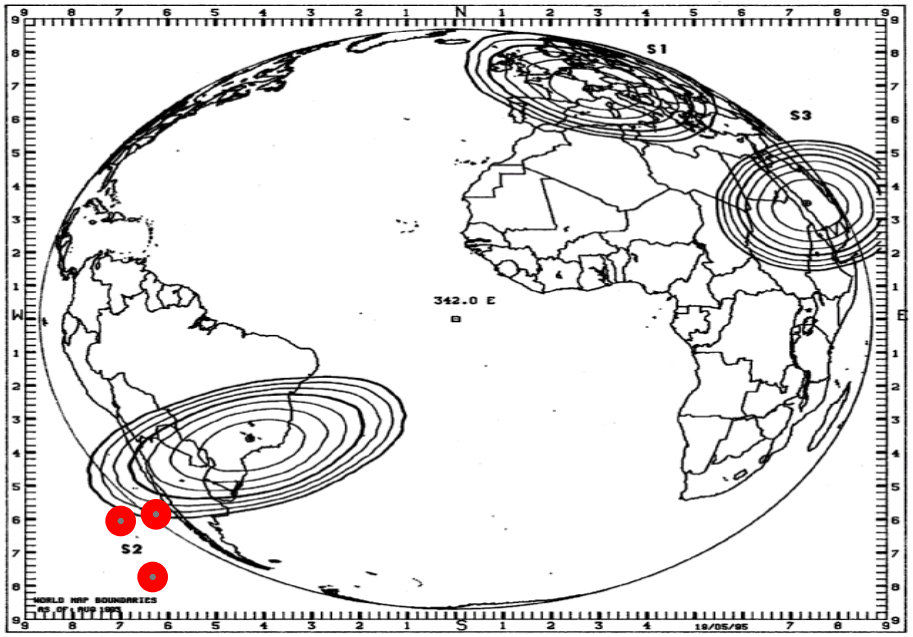
Satellite based Supervisory (IntelSat 706)

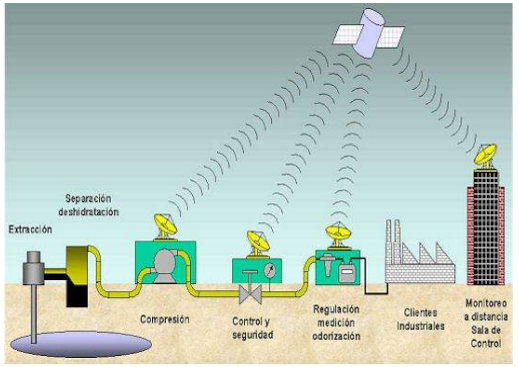
KU- Band:

- Frequency Uplink :14.0 GHz - 14.5 GHz
- Frequency Downlink :10.95 GHz - 12.75 GHz
- Geostacionary Location : 307° West
- Parabolic Antenna Inclination : 59°Norte

Link:

- Rate : 128 Kbps TCP-IP





3 Gas Control Rooms

Santiago Chile
Antofagasta Chile
Jujuy Argentina

Solution

Esri / OSIsoft Demonstration

Contact Information

- Kelly Sherrill, Upstream Business Development Upstream
  Ksherrill@OSIsoft.com
  OSIsoft.com

Happy Trails

Thank you