Turning Insight into Action

Presented by

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Regional Sales Manager
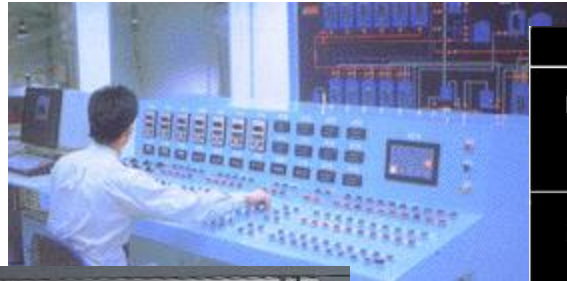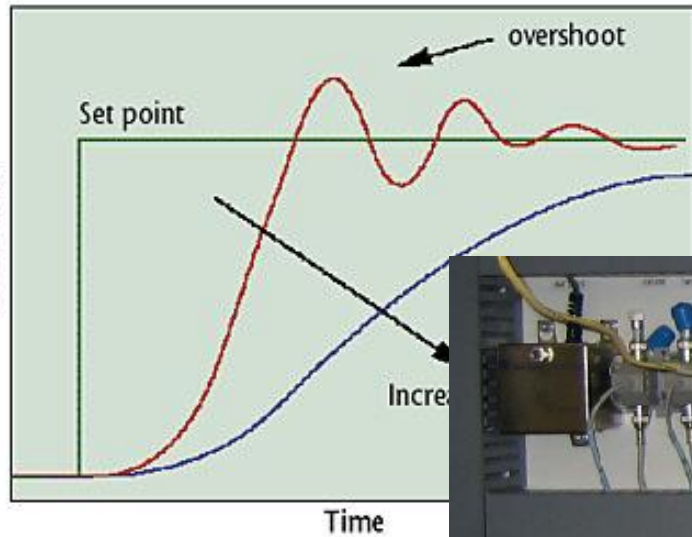
"The explosion in available data makes consolidating decision systems an increasing challenge."

"However, too much data can be overwhelming…"

"Volumes of Measurement Data are increasing at an alarming rate"

"…the shock your customers experience from the ongoing avalanche of exploding volumes of data…"

Did Your Company Lead the Data Renaissance?

Internet Brings New Focus on Data

"Information has gone from scarce to superabundant. That brings huge new benefits, but also big headaches."

Data, data, everywhere

The Economist, February 25, 2010

(http://www.economist.com/node/15557443)

Emerging concept "Big Data"

- New term has been introduced:

"Big data" refers to datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze.

- 10 terabyte to petabyte size range
- 10 TB is only 72 days of PI System data at 100,000 events/second

Leveraging the Data

- Spell checkers
  - Mascarade
  - http://www.bing.com/search?q=mascarade&go=&qs=n&sk=&sc=8-9&form=QBLH
- Amazon's Kindle
  - Spying on how we read
    - Read speed, most abandoned, trophy books, biggest slogs, etc.
- Personalized advertisements
  - What you purchased in the past
  - Where you have browsed

Other Interesting Trends

- Data is widely available now—what's lacking is the ability to extract the insight

- Increased demand for those with data mining skills
  - Hal Varian, Google's chief economist, predicts that the job of statistician will become the "sexiest" around.

Some Concerns and Responsibility

- Privacy violation?

- Use the data to improve the experience not intrude

- Fortunately, we are looking at inanimate objects—manufacturing equipment and processes
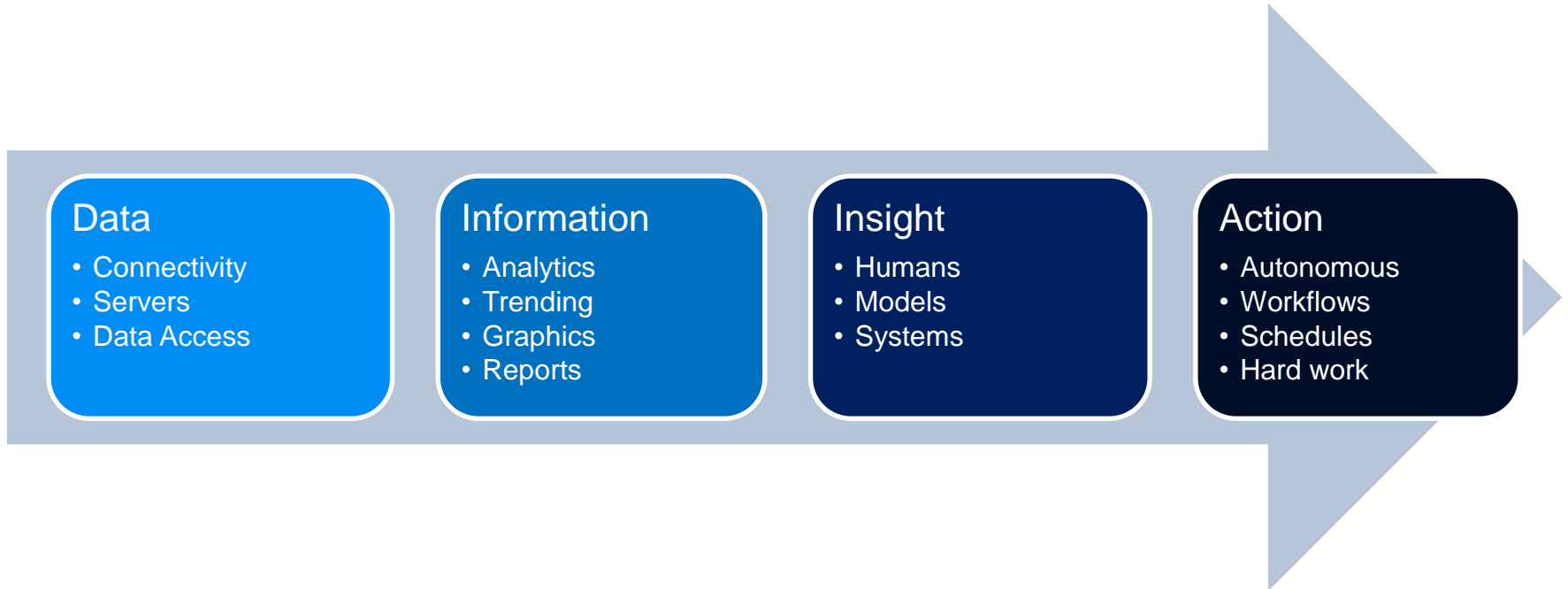
Value to be Gained Leveraging Big Data

- $300 Billion/year in US Healthcare
- €250 Billion/year in Europe public sector administration
- $100 Billion revenue for service providers
- 60% increase in net profit in US retail
- 7% reduction in working capital in manufacturing
- Up to 50% in product development and production costs in manufacturing

Source: Dobbs, Richard; Bugin, Jacques; Hung Byers, Angela; Roxburgh, Charles; Manyika, James; Global Institute, McKinsey; Brown, Brad; Chui, Michael (2011-05-13). Big data: The next frontier for innovation, competition, and productivity (Kindle Locations 95-96). McKinsey Global Institute. Kindle Edition.

Turning Insight Into Action

- Information Value Chain

Data	Information	Insight	Action
• Connectivity	• Analytics	• Humans	• Autonomous
• Servers	• Trending	• Models	• Workflows
• Data Access	• Graphics	• Systems	• Schedules
	• Reports		• Hard work

The PI System and "Big Data"

Vital in maintaining Situational Awareness
- Know where your business is now

Cornerstone of Continuous Improvement
- Be a Learning Company

Foundational for Sustainability & Innovation
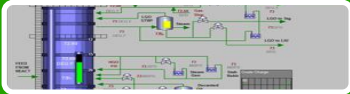- Build Longevity & Competitiveness

Capabilities

Acquire Data
- Interface systems and acquire streaming data and events

Historize
- Store at resolution of acquisition and trend on demand

Present
- Engineered and Ad-Hoc displays

Analyze
- Pre & Post processing including simple to complex calculations

Organize
- Structure PI data through PI Points, PI Elements and PI Events

Monitor
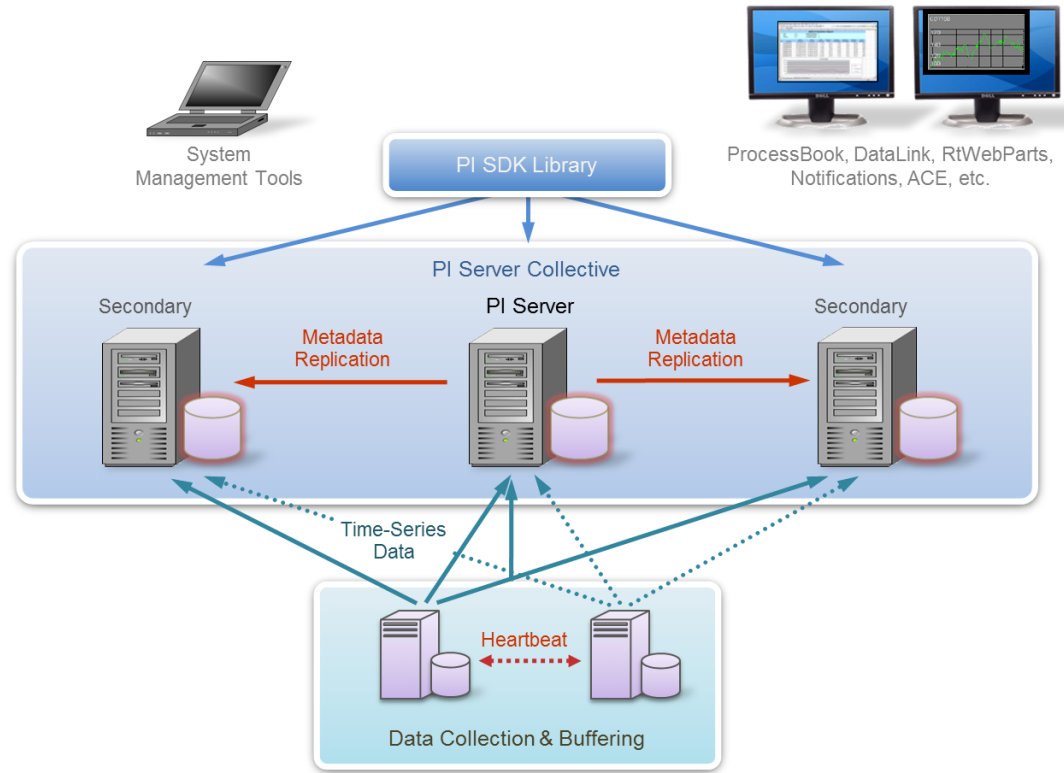- Process rules & Notify, Alert on event

Integrate
- Data Exchange with other Systems

Intrinsic Values

- Reliability
- Availability
- Interoperability
- Scalability
- Extensibility
- Security

Customer Example

Long-Term Contractual Asset Portfolio
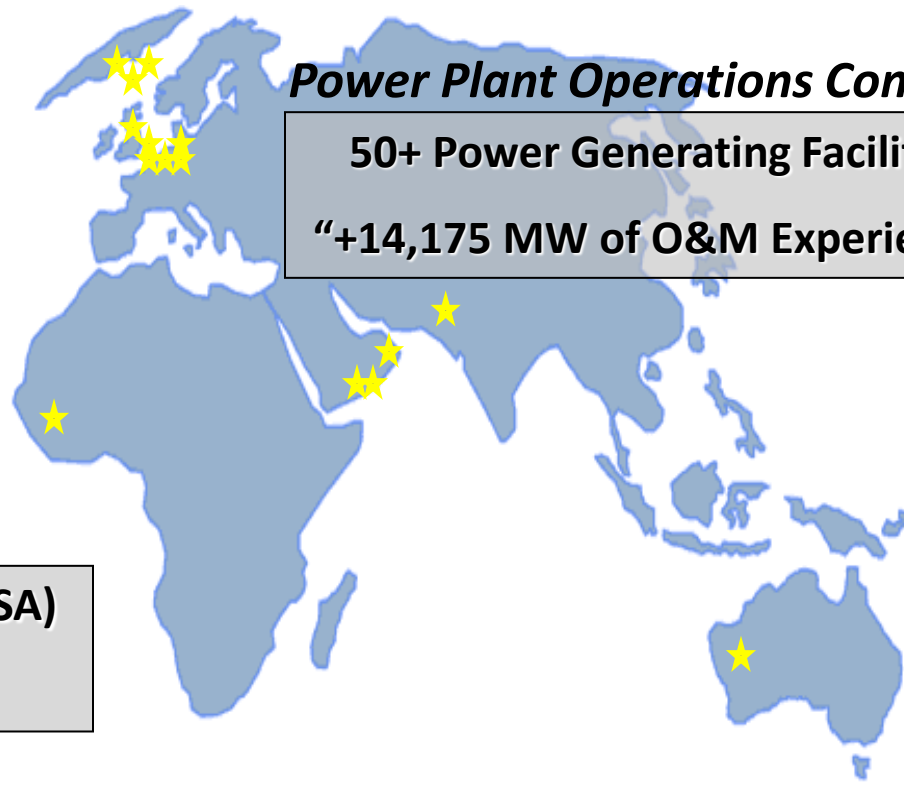## "Diverse Gas Turbine Technology and Geographical Locations"

Wood Group GTS
Keep on turning

Power Plant Operations Contracts

50+ Power Generating Facilities

"+14,175 MW of O&M Experience"

Turbine Maintenance Contracts

40+ Long Term Service Agreements (LTSA)

"+7,542 MW Under Contract"

Power Plant - ACTION

Vibration / Combustion / Performance

Turbine Control

PI Server

ACL
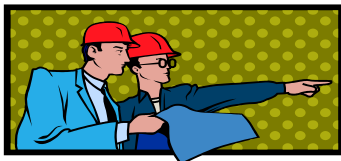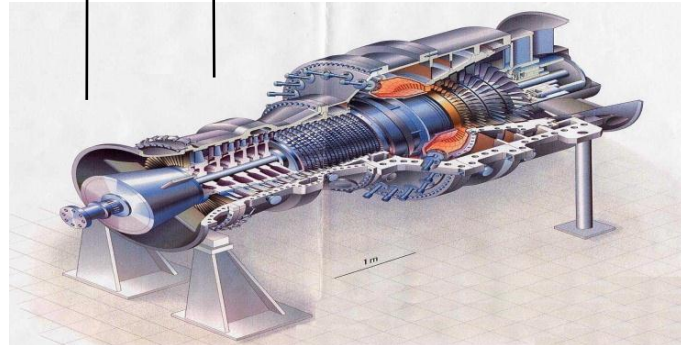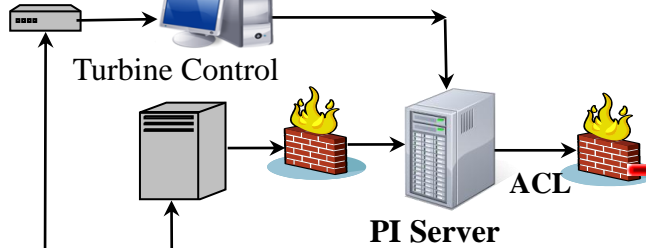
On-Site O&M

Process Data

IPsec VPN

Solutions

SERVICES

remote monitoring

web graphics/trends

periodic reports

engineering analysis

technical support

recommendations
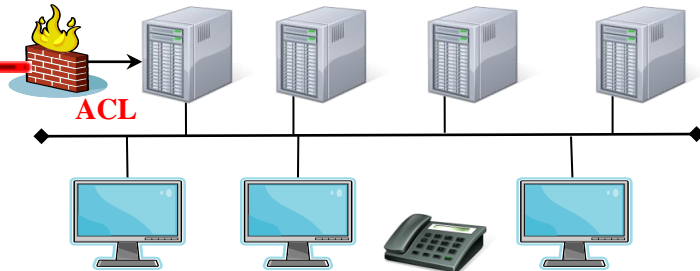
pager / email alerts

Wood Group RM&D Center - INSIGHT

WOOD GROUP

PI to PI Interface

PI Server

PI ACE

PI WebParts

ACL

Diagnostics Engineering

Customer Contract Managers

Global Engineering

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Gas Turbine Degradation Management

How Did My Scheduled Maintenance Effect Gas Turbine Performance? What's the Economic Bottom Line?

Asset Configuration	E-Tech CTG	E-Tech CTG	
CT Technology	Pre-Outage	Post-Outage	
Assumptions	Base Cogen	Base Cogen	Units
Nominal Capacity	82.2	85.7	MW
Nominal Heat Rate (HHV)	10,879	10,692	Btu / kwh
Service Factor	95%	95%	%
Base Load Run Time %	90%	90%	%
Part Load Run Time %	10%	10%	%
Nominal Fuel Cost	$3.25	$3.25	$ / MMBtu
Nominal Power Price	$38.00	$38.00	$ / Mwh
Nominal Spark Spread	$2.64	$3.25	$ / Mwh
Avg Daily Mwh's	1,827	1,905	Mwh / Day
Avg Hourly Revenue	$201	$258	$ / Hour
Avg Daily Revenue	$4,830	$6,194	$ / Day

- **Output Increased 4.3%**

- **Heat Rate Decreased 1.7%**

- **$0.60 Increase in Spark Spread**

- **$1,364 / Day Increase in Revenue**

- **$42,000 / Month = $252,000 over 6 months**

There is no Finish Line

- It is a continuous job meeting our responsibilities
  - New technology, for example Microsoft Azure
  - New expectations

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Turning Insight Into Action

- Insight:
    - Ability to see clearly and intuitively into the nature of a complex situation
    - Power to discern the true nature of a situation
- Action:
    - Ability to achieve a purpose or a goal
    - Power to redirect and control the outcome

Thank you