OSIsoft®

REGIONAL SEMINARS 2012

The Power of Data

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The Power of Data

Presented by **Sue Quense**

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New York Stock Exchange

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VISA: 300 Million Transactions / Day

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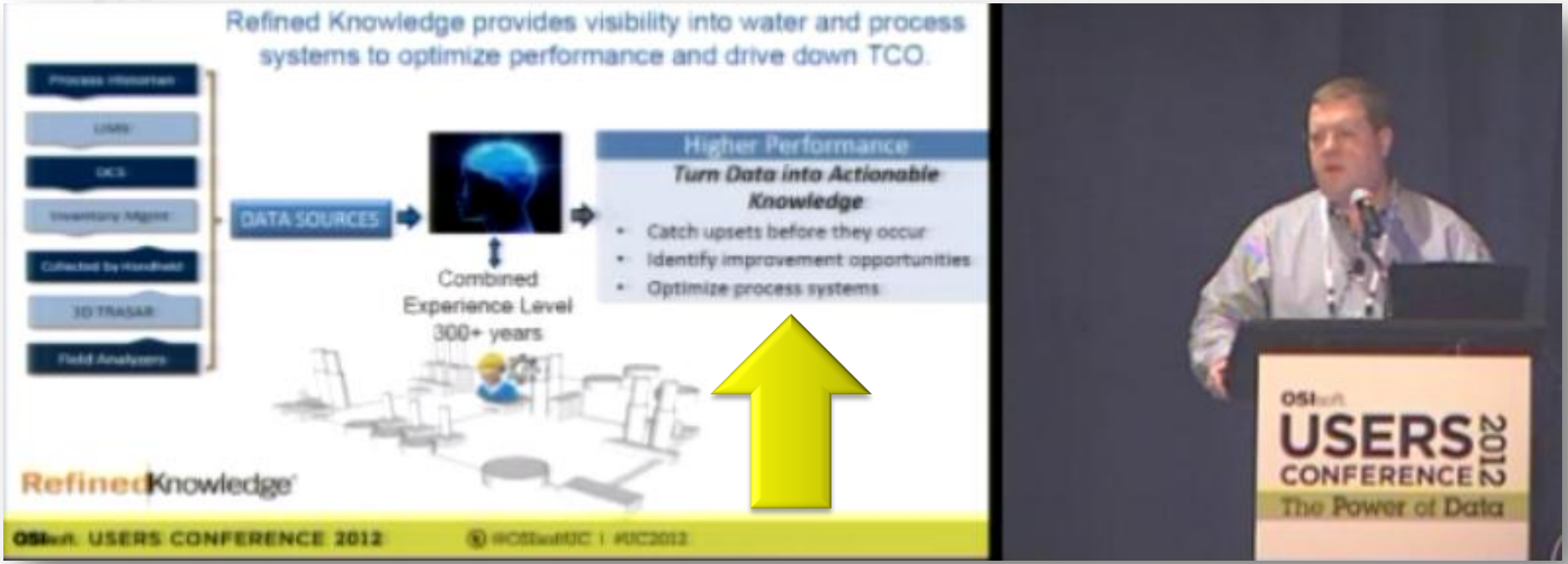
NALCO



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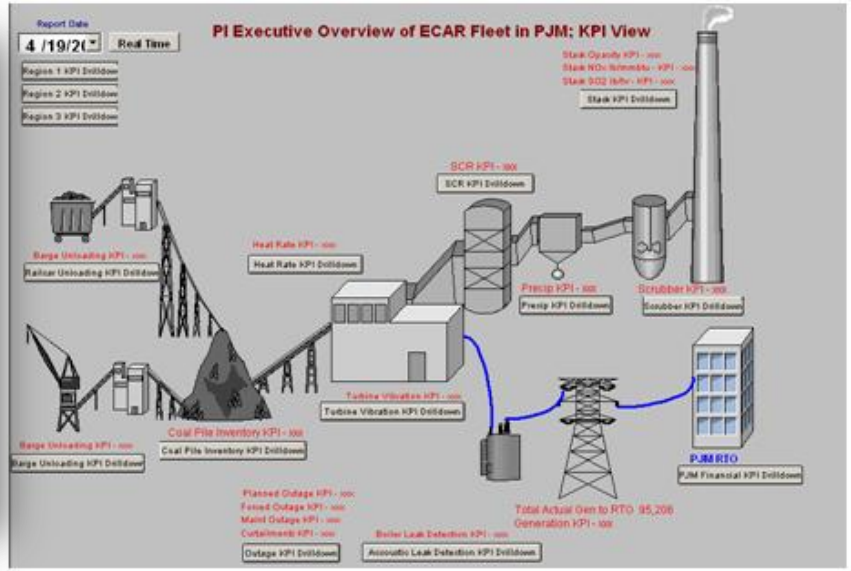
The Challenge
Provide Those That Need The Data The Big Picture

PI Helps Control Production Costs

Controllable Cost	Units	Actual	Target	Design	Deviation from Target (Btu/Kwh)	Cost ($/Shift)	Total ($/Shift
Main Steam Pressu	PSIG	1,985	2,000	2,000	-50 150	$6.48	$.0
Main Steam Temperati	F	976	962	1,050	-50 150	$-32.04	$-2
1st RH Steam Temperati	F	976	948	1,050	-50 150	$-59.76	$-3
1st Reheat Attemperat	lb/hr	1,079	0	0	-50 150	$1.86	$0
Excess Ai	%	21.4	19.8	14.0	-50 150	$20.86	$.1
Exit Gas Temperatu	F	359.4	329.7	305	-50 150	$150.12	$17
Steam Coil Air Heaters	klb/hr						
Condense	in. of HG	1.13	0.92	0.77	-50 150	$64.98	$8
HP Feedwater Heate	Btu/Kwh	5.2	0	0	-50 150	$8.61	$1
LP Feedwater Heaters	Btu/Kwh						
Auxiliary Pow	Mw	14.33	16.08	15.41	-50 150	$-186.90	$-13
Total Operator Controllable C					-50 150	$-25.79	$6



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Shell Global Solutions

Unlock the Value in Process Data

Making Money with Statistics & Datamining

David Stockill
Shell Global Solutions International
12th April 2001

Why do it - whats it all about?

- Process Data is a Huge Untapped Asset
- The only definitive record of Plant Performance
- Trending is not enough - we are only human!
- Key issues surround the **combination** of plant variables.

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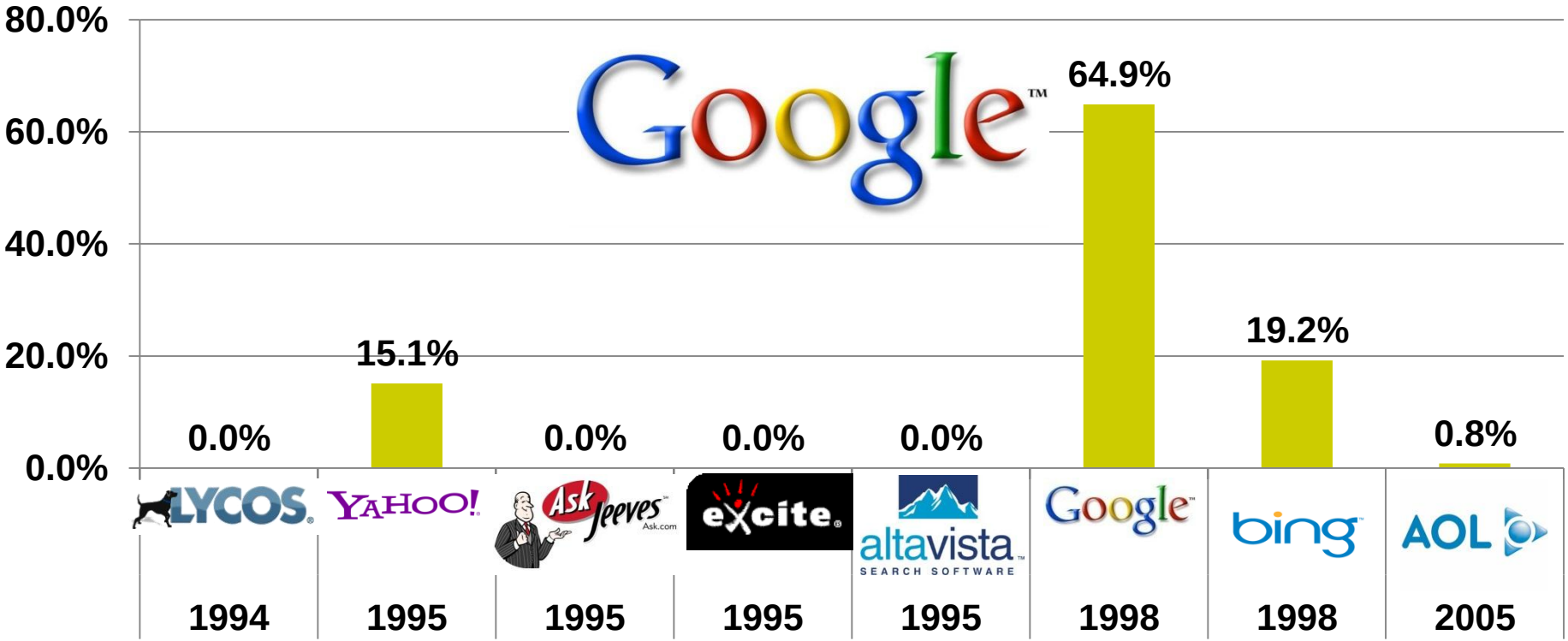
US Core Web Search Market Share - Aug 2012



http://finance.boston.com/boston/news/read?GUID=22253566

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- Why did they beat the earlier contenders?
  - Recognized there was more to the data than meets the eye (clicks)
  - Technology: Map-Reduce

"This Google Algorithm always works for me!"

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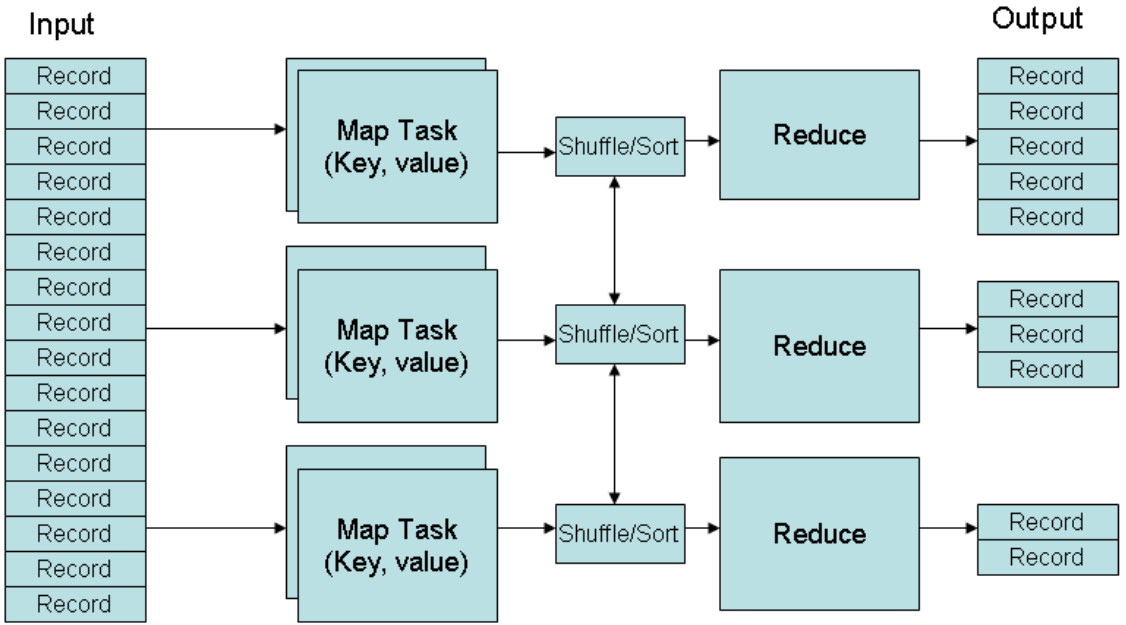
Map-Reduce



- Technology
- Acts on data
- Solves a specific class of problems

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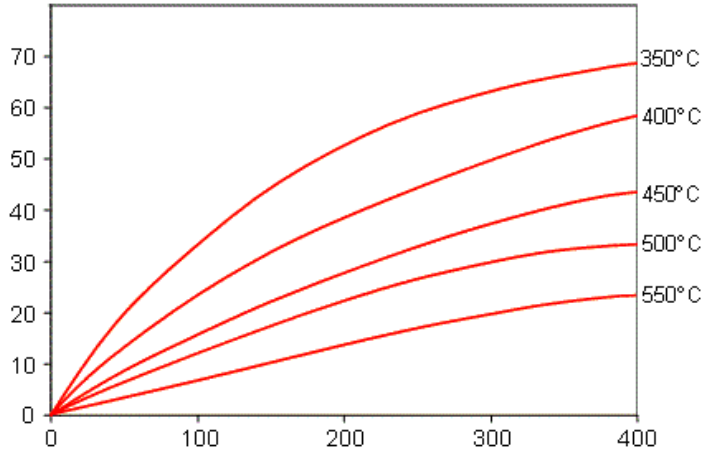

- Early to Mid-1980s: started out in Advanced Control
  - Recognized there was more to the data than meets the eye (historical data might have uses beyond immediate calculation needs)
  - Technology: PI-Time series database optimized for high collection and retrieval rates. Interfaces to many real time sources

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Keys to Unlocking the Power of Data

- Understanding the problems at hand--what are you trying to solve. What questions are you trying to answer?

  "The important and difficult job is never to find the right answers, it is to find the right question."
  Peter Drucker, *The Practice of Management*

  "The formulation of a problem is often more important than its solution."
  Einstein

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Keys to Unlocking the Power of Data

- Collect ALL the data. Think beyond the obvious and especially consider data that may not last long.

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Keys to Unlocking the Power of Data

- Utilize technology and develop skills to do the analyses

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Keys to Unlocking the Power of Data

- Harness people's ingenuity, insight and creativity to have some ideas that can be proven or disproven with proper data analysis.

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What's new?

- Availability of lots of data from many sources; and growing
  - Machine and devices
  - Business
  - WWW
  - Social Media

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Big Data

“Datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze"

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.

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Characteristics of Big Data

Volume

Velocity

Variety

Valuable

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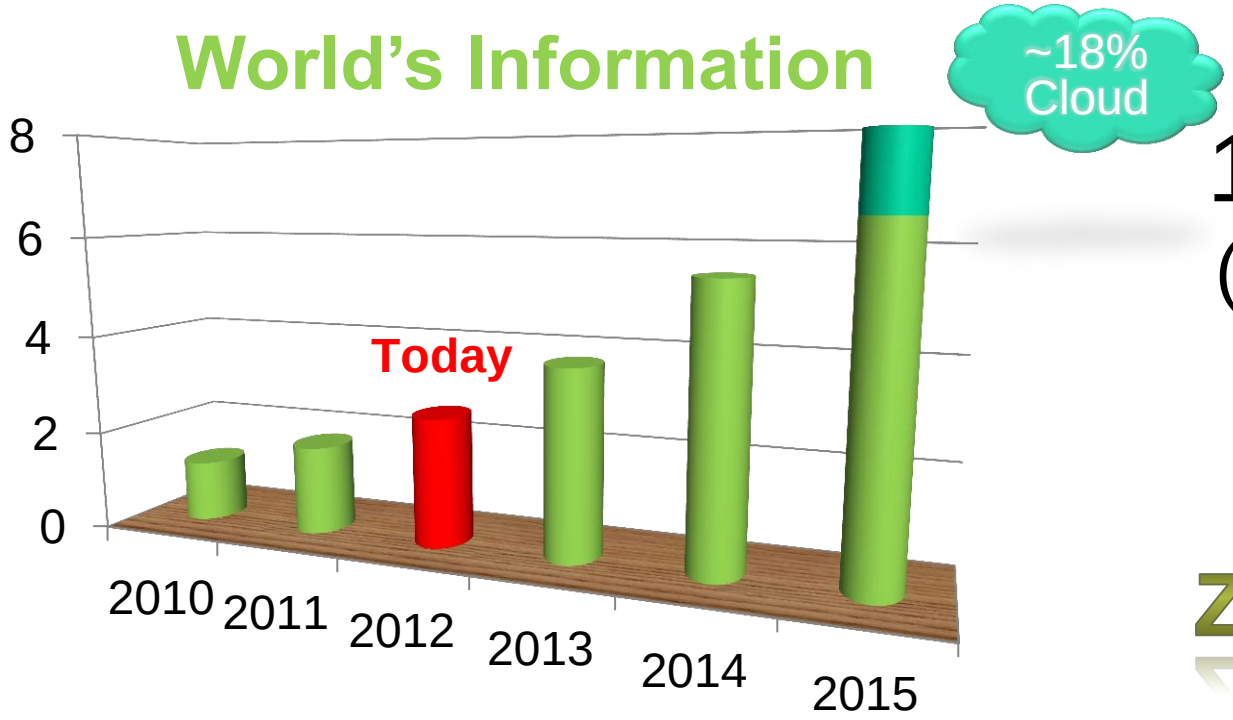
Volume



10^{21} bytes
(1 billion TB)

ZETTABYTES

Source: http://www.emc.com/leadership/programs/digital-universe.htm

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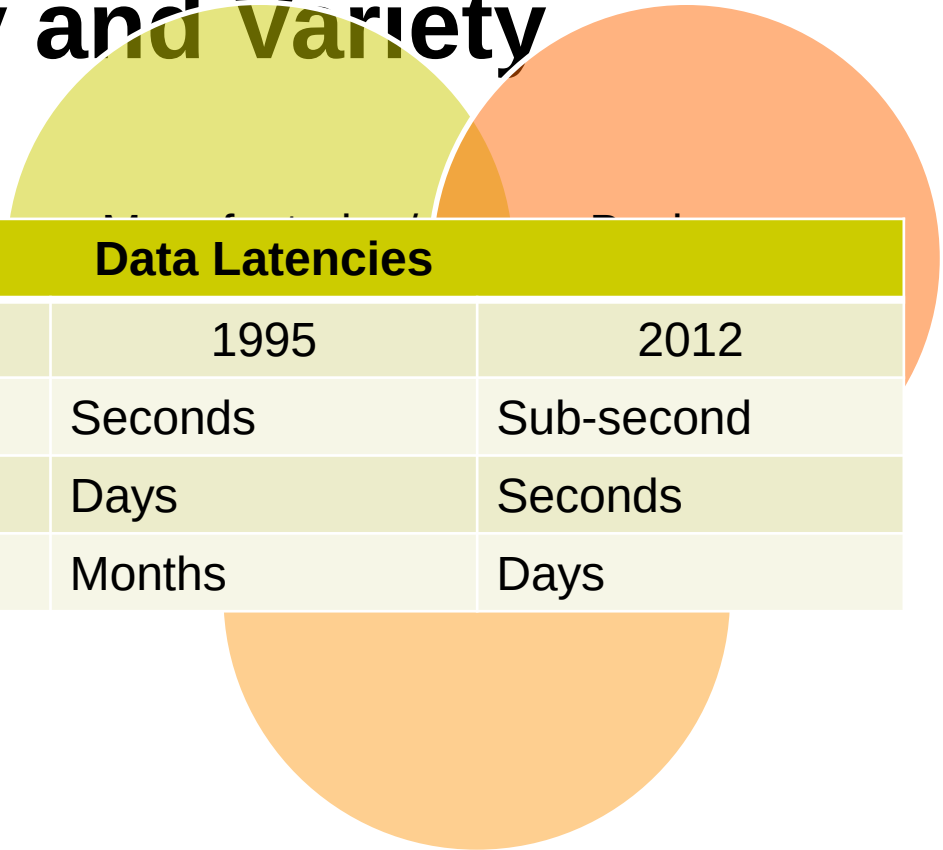
Velocity and Variety



Data Latencies		
	1995	2012
Mfg/Ops	Seconds	Sub-second
Business	Days	Seconds
Customer	Months	Days

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Building a Big Data Function

- Commit to data as a Competitive Advantage
- Organize to exploit Big Data's potential
- Build out a low-cost, reliable infrastructure for data collection and storage (and distribution)
- Flexible infrastructure that can scale up effectively
- Start layering on complex analytics

1 Jeff Hammerbacher, "Competing through data: Three experts offer their game plans", McKinsey Quarterly, October 2011, McKinsey Global Institute

2 Brad Brown, Michael Chui, and James Manyika, "Are you ready for the era of 'big data'?", McKinsey Quarterly, October 2011, McKinsey Global Institute

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Infrastructure

- Most efficient way to deliver services needed
- by many. Examples:
  - Communication
  - Energy
  - Water
  - Transportation

- Data Infrastructure
  - As important as other infrastructure
  - Collects and Organizes data
  - Includes tools that help transform data into knowledge
  - Integral to the success of the other infrastructures

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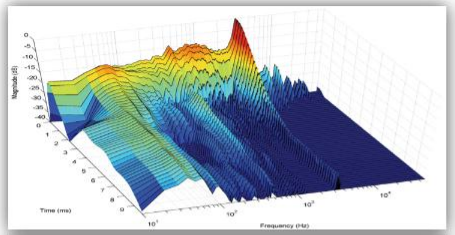
PI SERVER 2012



Syncro Phasors

430TB

4.8K data streams, 120Hz
3 years online
Unique Events: 55 Trillion
Estimated Data: 430TB

Data Center

840TB

100K cells, 2M breakers
10 years online
Unique Events: 105 Trillion
Estimated Data: 840TB

Automated Metering

1,410 TB

20M meters, 5-min reads
7 years online
Unique Events: 177 Trillion
Estimated Data: 1,410TB

Fleet Monitoring

50,460 TB

1K assets, 1M points
10 years online
Unique Events: 6,307 Tr
Estimated Data: 50,460TB

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PI Server 2012

	2010 R3	2012
Max Point Count	2 x 10^6	20 x 10^6
Max Data In Rate	100,000 ev/sec	1 x 10^6 ev/sec
Max Data Out Rate	5 x 10^6 ev/sec	10 x 10^6 ev/sec
Online Archives	5,000 archives	50,000 archives
Real-time Updates	200,000 sign-ups	10 x 10^6 sign-ups
Point Changes	10 points/sec	2,000 points/sec
Startup Time	20 minutes	10 minutes

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Insights For Any Data, Any Size, Anywhere

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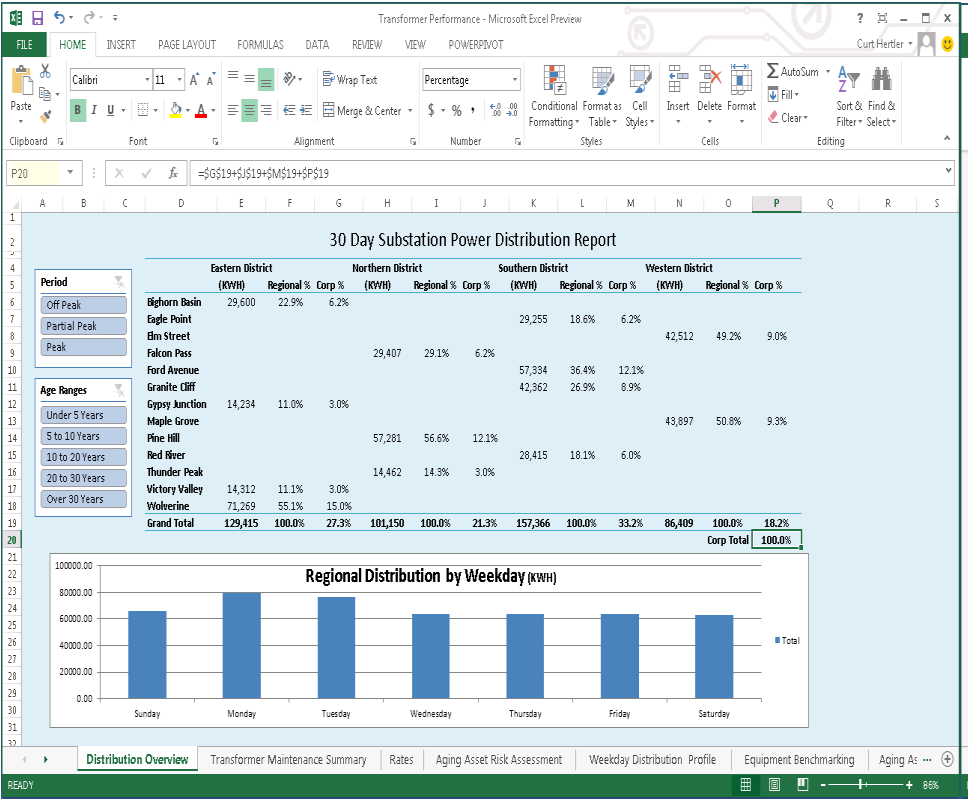
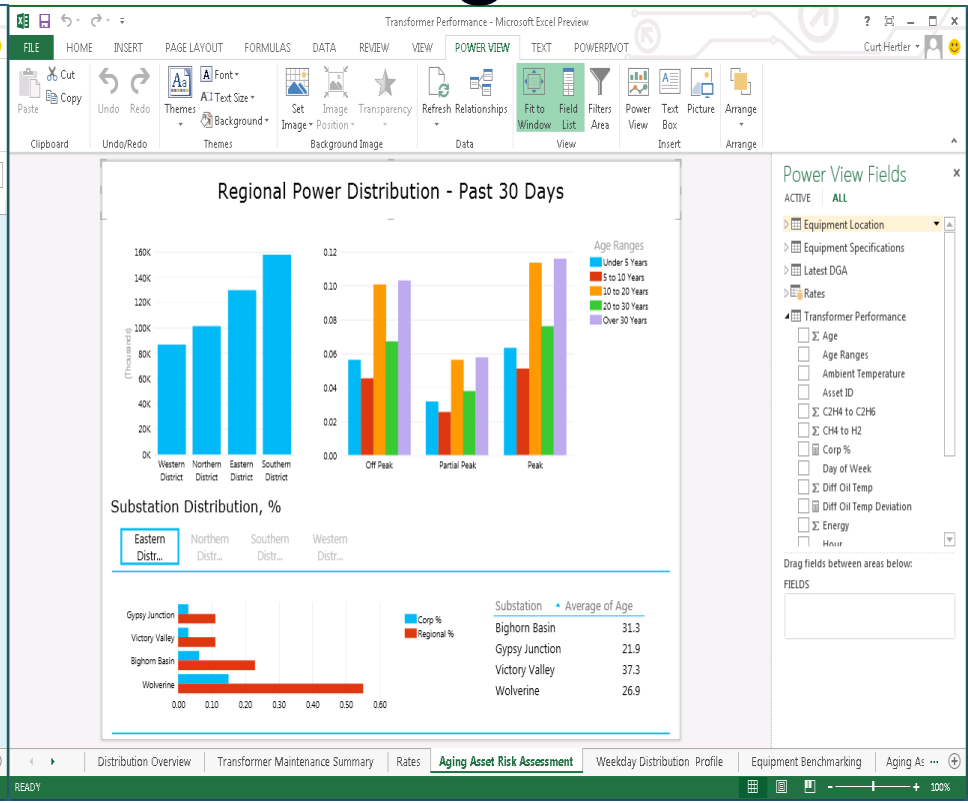
Microsoft Business Intelligence





PowerPivot

Power View

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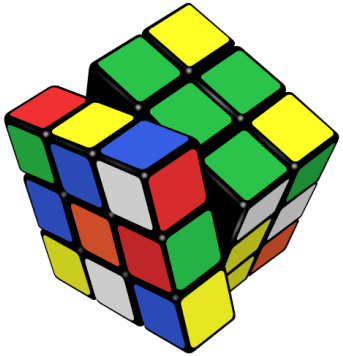
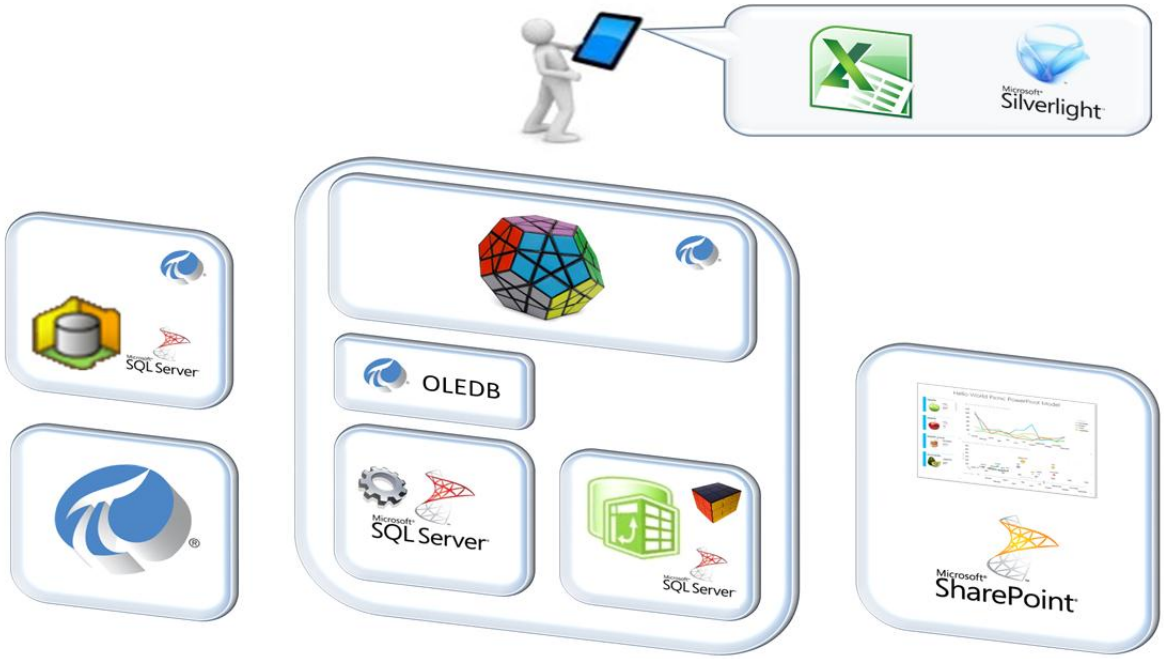
OSIsoft: Project Rubik

Goal: Integrate PI System Data with Microsoft BI





- Bridge the Gap
- Auto-build BI models
- Proper data aggregation

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Keys to Unlocking The Power of Data

1. Understanding the problems at hand--what are you trying to solve; what questions are you trying to answer?
2. Collecting ALL the data. Think beyond the obvious and especially consider data that may not last long.
3. Utilize available technology and develop skills to do the analyses
4. Your ingenuity and insight lead to discovery of solutions!

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THANK YOU

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