OSIsoft®

REGIONAL SEMINARS 2012

The Power of Data

The Power of Data

Presented by **Dave Roberts**

@OSIsoftDRoberts

VISA: 300 Million Transactions / Day

Shell Global Solutions

Unlock the Value in Process Data

Making Money with Statistics & Datamining

David Stockill
Shell Global Solutions International
12th April 2001

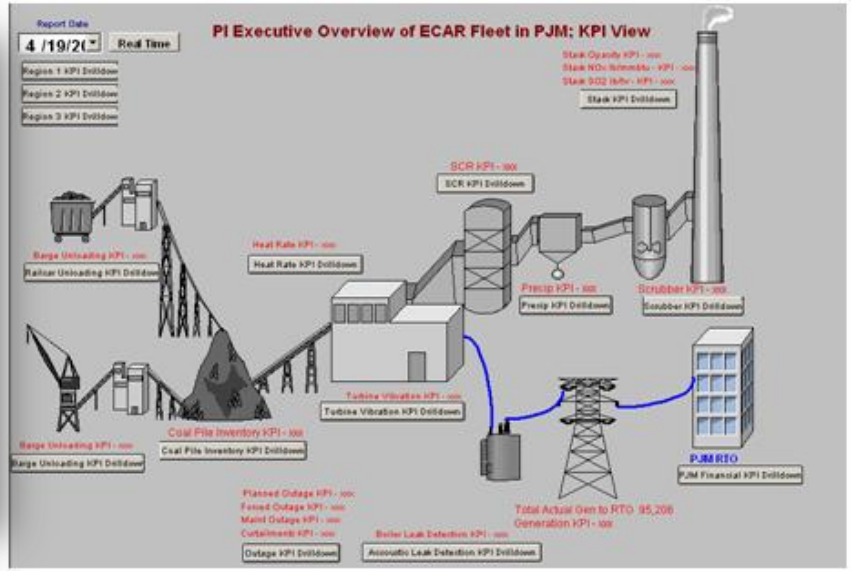
Why do it - whats it all about?

- 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.

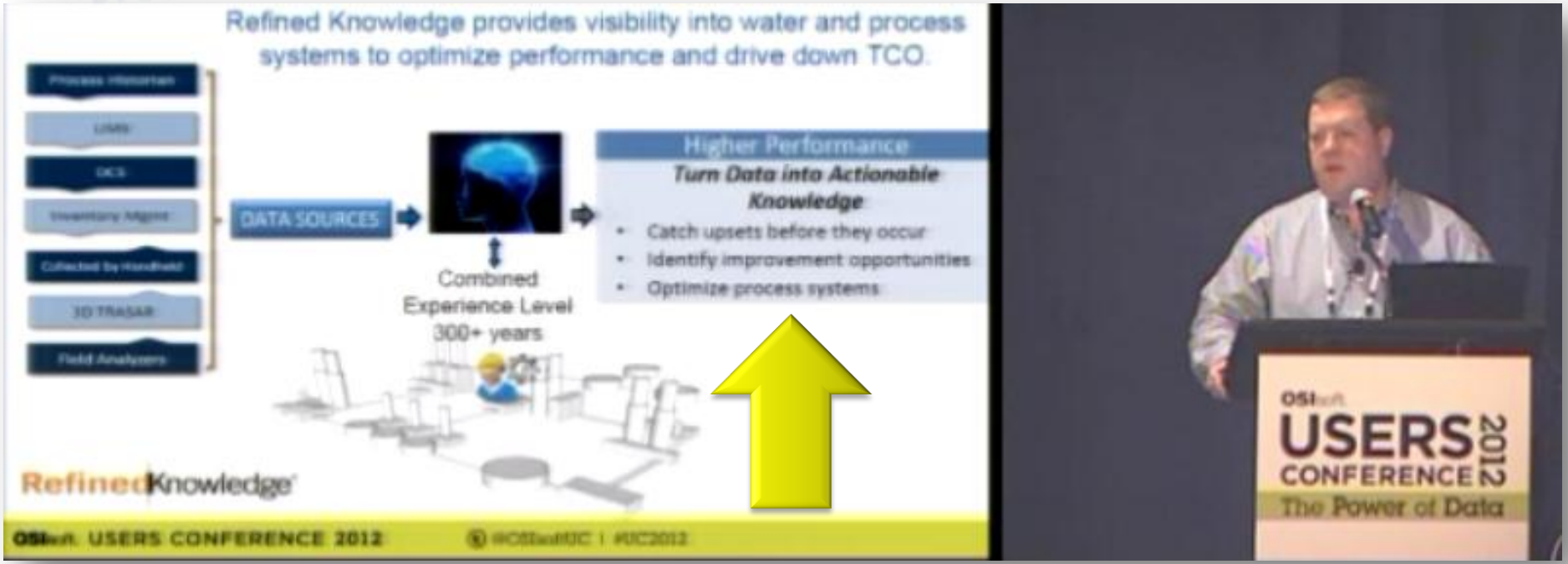
The Challenge
Provide Those That Need The Data The Big Picture

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



NALCO



Companies that invest in the value that data provides will prosper.

1998

1995

1994

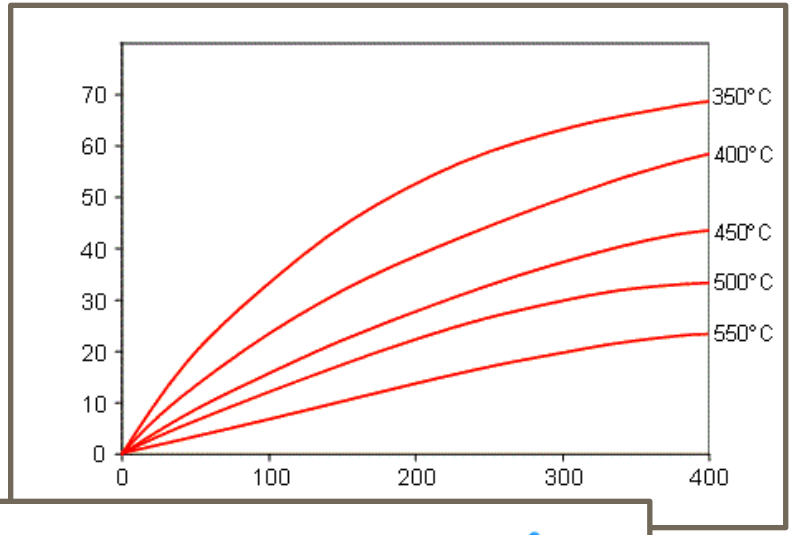
1995

1994

1995

OSIsoft History

- Advanced control
- Asymptotic nirvana
- Business nirvana?

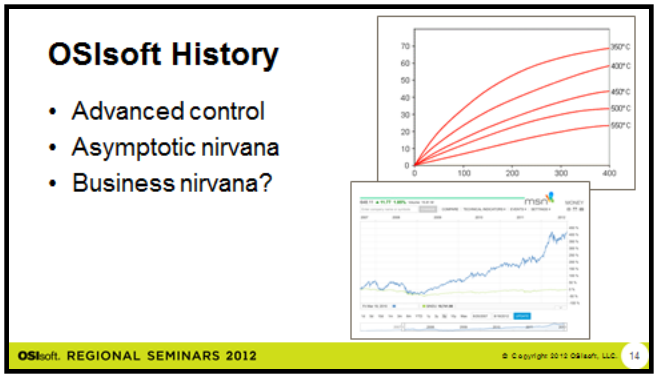


Business Success

- Advanced control: a metaphor for business success?
  - In market availability
  - Matching production to customer demand
  - Regulatory compliance

The Power of Data

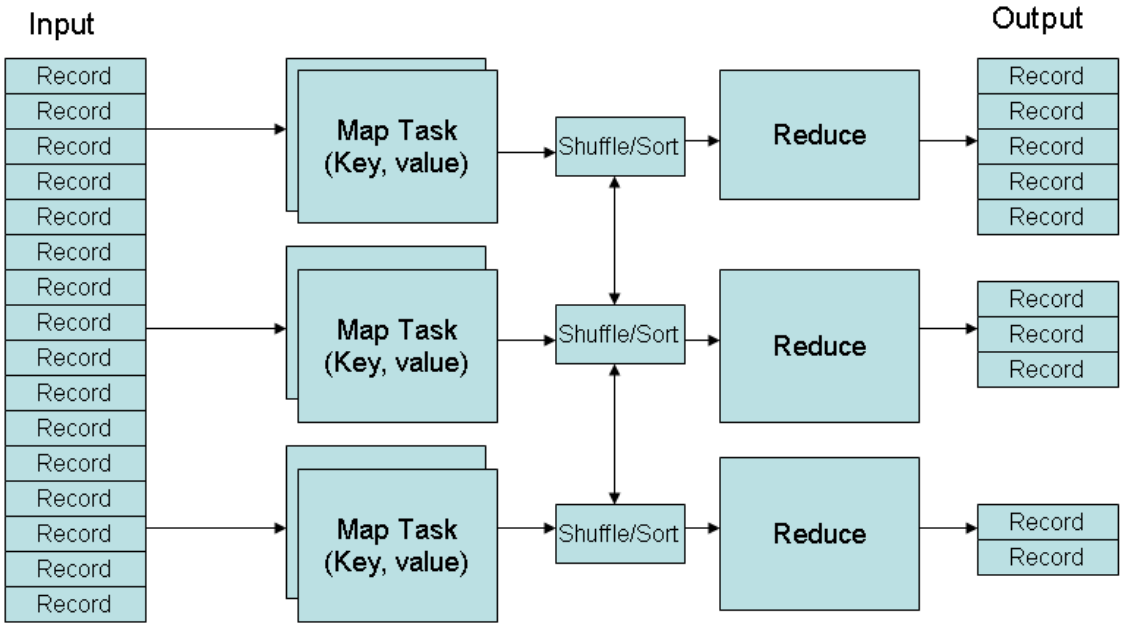
- Advanced control is a use of data
- But, there are many other uses of the data
- Our customers liked the advanced control but they loved the data



Google

- Why did they beat the earlier contenders?
  - Technology
  - Recognized there was more data than meets the eye

Map-Reduce



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

Match "Big Data Technologies" to Your Requirements

Some technologies for your toolbox (and there are many more …):

Technology	Use
Column-store DBMSes	For analytic data marts and "near line"; use in-memory for high performance applications
Complex event processing	For real-time analytics and alerting on high velocity or high volume data streams; filter, aggregate data to reduce storage
In-memory analytics	For fast query and calculation performance against large volumes of data
alternatives	batch approach is acceptable
Semantic Web	For mining content, including social media
Text analytics	For deriving information from text sources, *through, for example, summarization, sentiment analysis, explication, and classification*
Visualization tools	For user presentation of complex or fast-changing analytic results

Real time data and event infrastructure

Managing and using big data is about more than Hadoop and MapReduce …

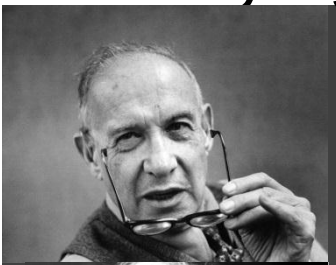
Gartner

You Can’t Buy a Big-Data Solution

- Key is executive level commitment
- This is about business transformation leveraging fundamental types of data:
  - Manufacturing/Process
  - Business
  - Customer
  - Social
- Technology is an evolving enabler

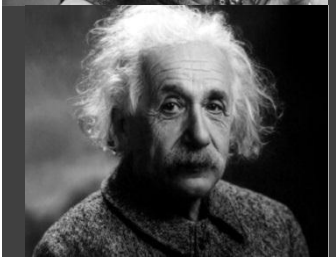
Keys to Unlocking the Power of Data

- 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*

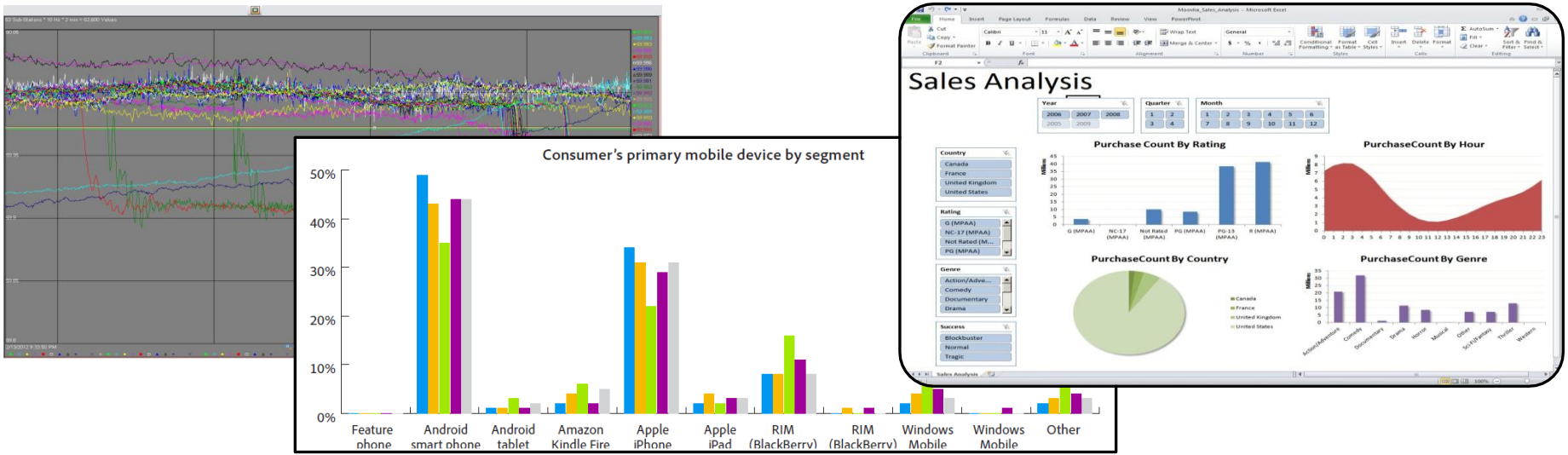


"The formulation of a problem is often more important than its solution."

Albert Einstein

Keys to Unlocking the Power of Data

- All the data. Think beyond the obvious and especially data that may not last long.

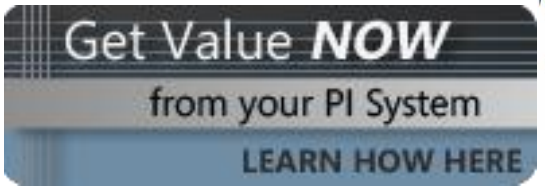


Keys to Unlocking the Power of Data

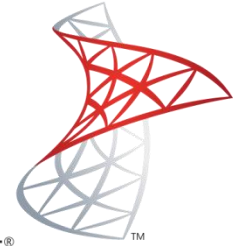
- Ingenuity, insight and discovery to have some ideas that can be answered with proper data analysis.

Keys to Unlocking the Power of Data

- The technology and skills to do the analyses



OSIsoft®



Microsoft® SQL Server®

What's New?

- Availability of lots of data from many sources; and growing
  - Machine and devices
  - Business
  - WWW
  - Social
- Technology to process, store, access and analyze the data

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.

Characteristics

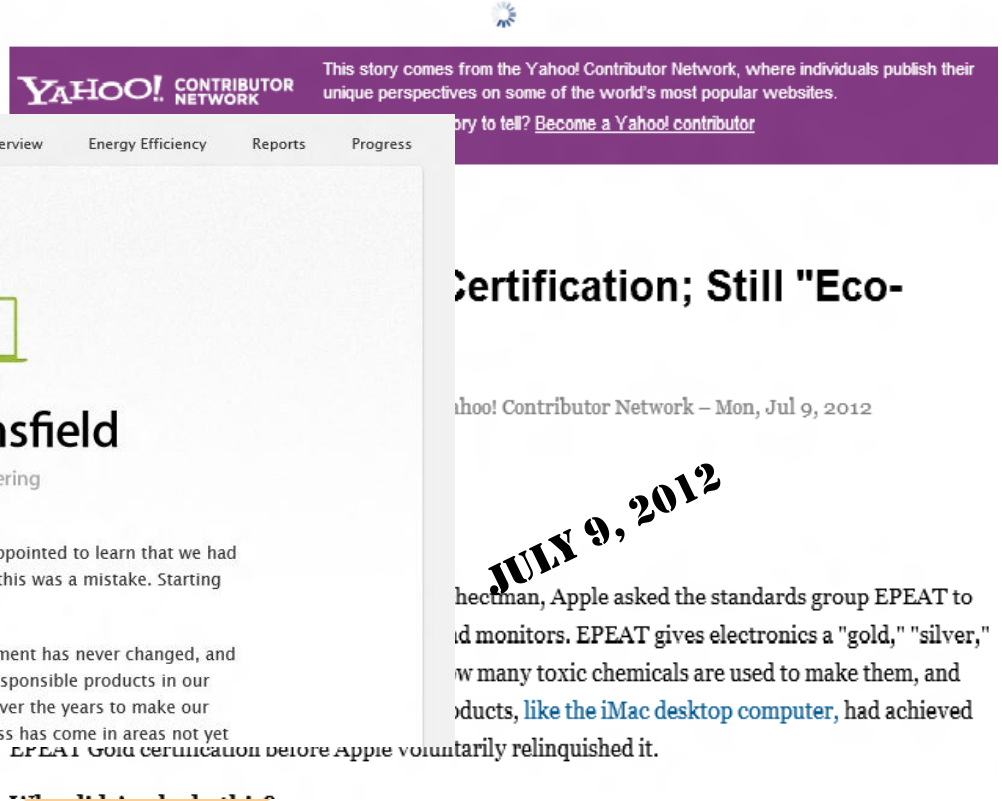
Volume

Velocity

Variety

Valuable

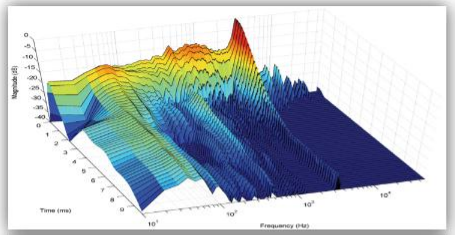
Variety



Data Infrastructure

- As important as other infrastructure
  - Communication
  - Energy
  - Water
  - Transportation
- Most efficient way to deliver services needed by many

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

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

“Big Data”

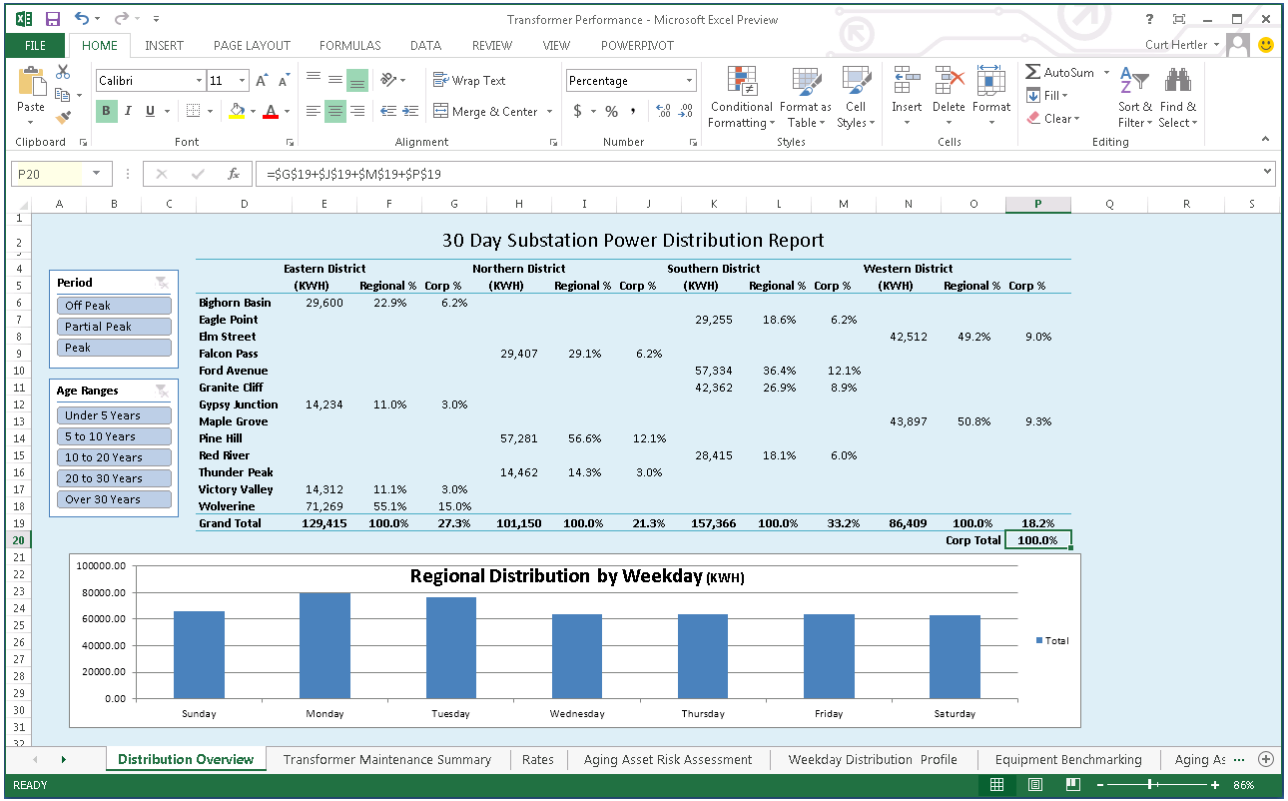
- IBM Smart Grid
  - 350,000,000,000 events annually
  - Breaks down to 11,000 events per second
- PI 2012?
  - 1million events per second – IN
  - 10million events per secont - OUT

Big Data

- Volume 
- Velocity 
- Variety 

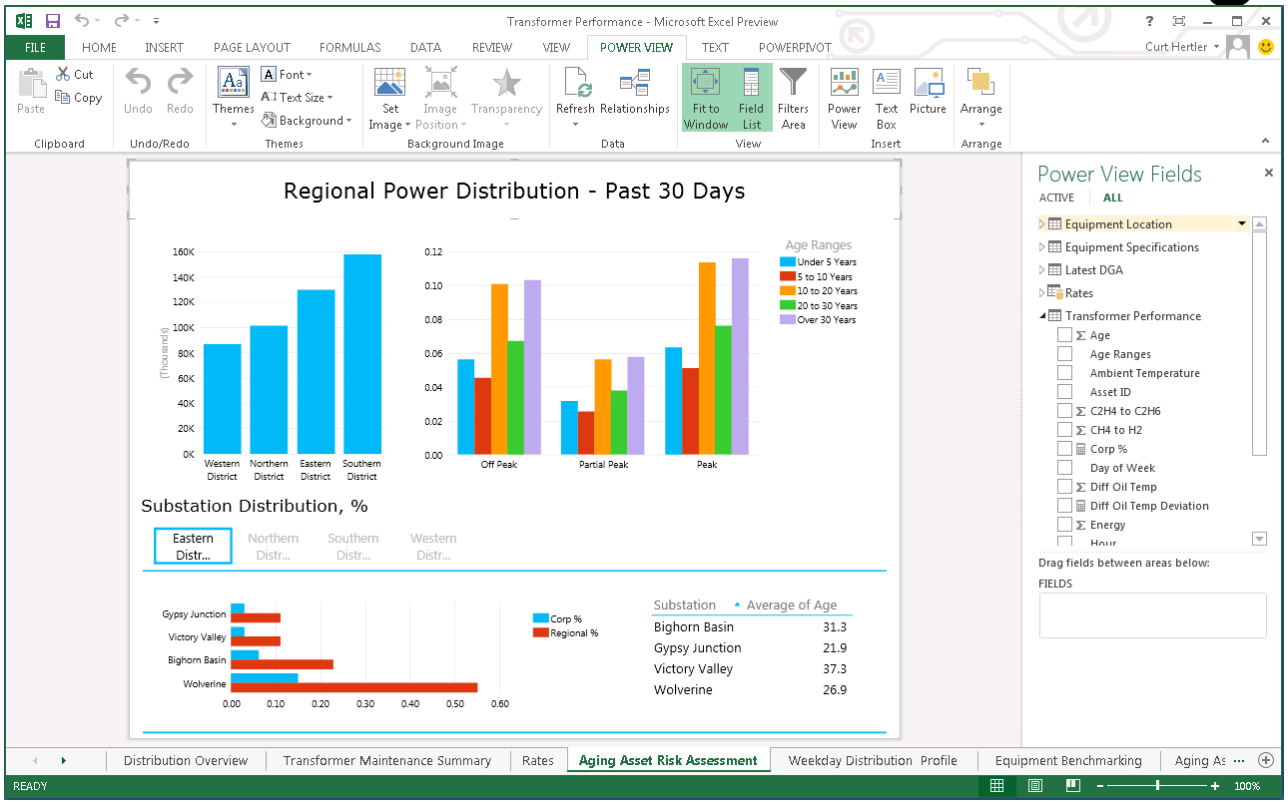
Insights For Any Data, Any Size, Anywhere

Microsoft Business Intelligence



PowerPivot

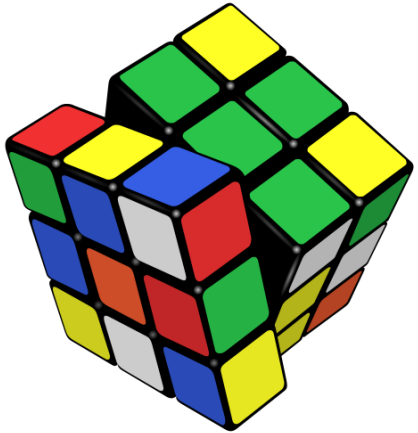
Microsoft Business Intelligence



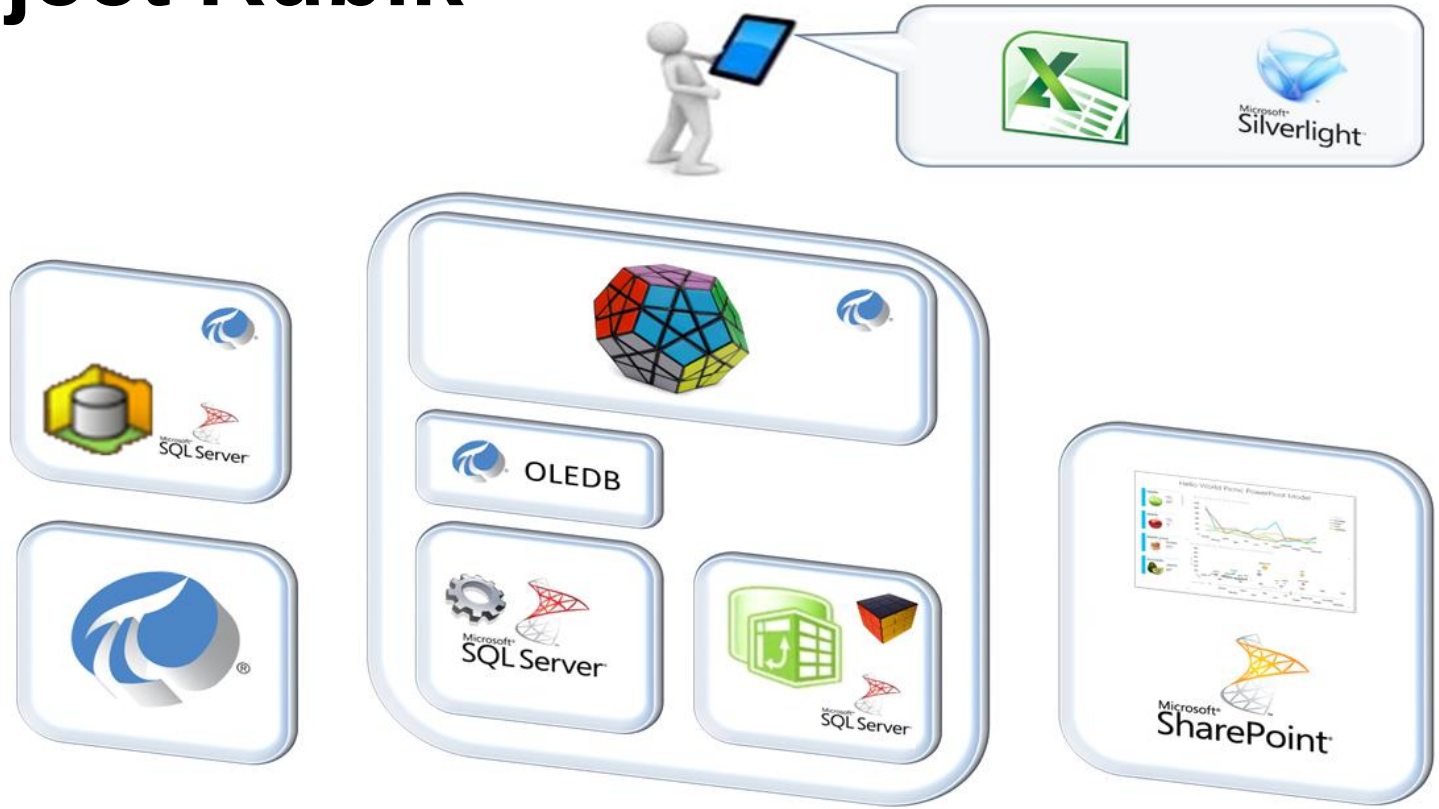
PowerView

Project Rubik

- Integrate PI System Data with Microsoft Business Intelligence
  - Configured models
  - Proper data aggregation



Project Rubik



The Power of Data

1. Understanding the problems at hand--what are you trying to solve; what questions are you trying to answer?
2. All the data. Think beyond the obvious and especially data that may not last long.
3. Ingenuity, insight and discovery; ideas that can be answered with proper data analyses.
4. The technology and skills to do the analyses

THANK YOU

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