OSIsoft.

REGIONAL SEMINARS 2012

The Power of Data

The Power of Data

Presented by **Todd Brown**

“It is a very sad thing that nowadays there is so little useless information.”

Oscar Wilde - 1894

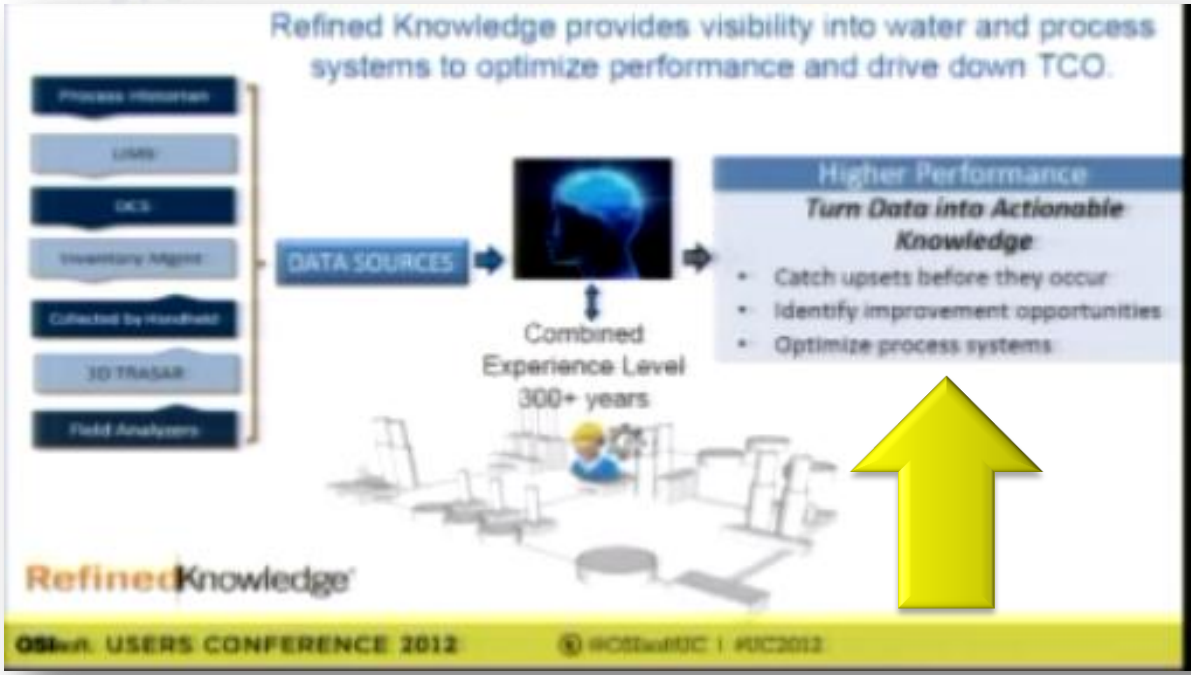
“Every day I wake up and ask, ‘how can I flow data better, manage data better, analyze data better?’”

Rollin Ford, CIO Wal-Mart

New York Stock Exchange

VISA: 300 Million Transactions / Day

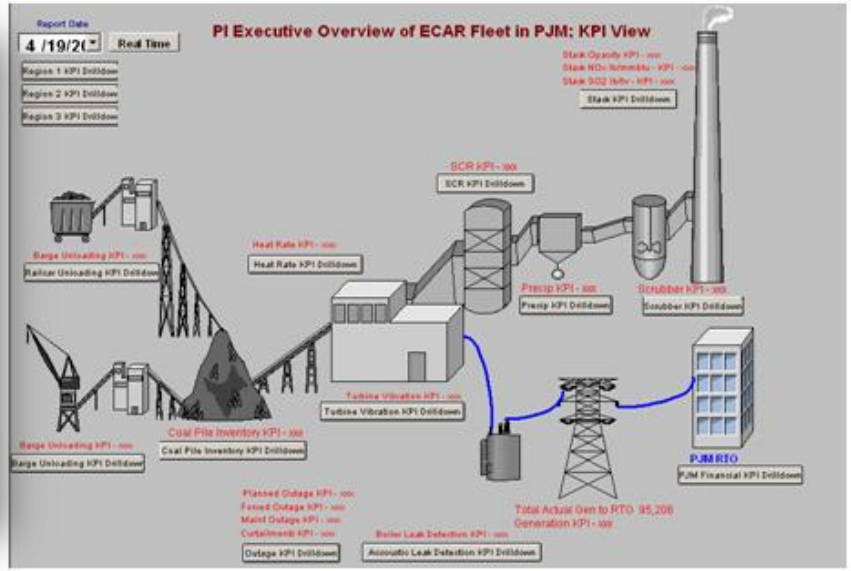
NALCO



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



Shell Global Solutions

Unlock the Value in Process Data

Making Money with Statistics & Datamining

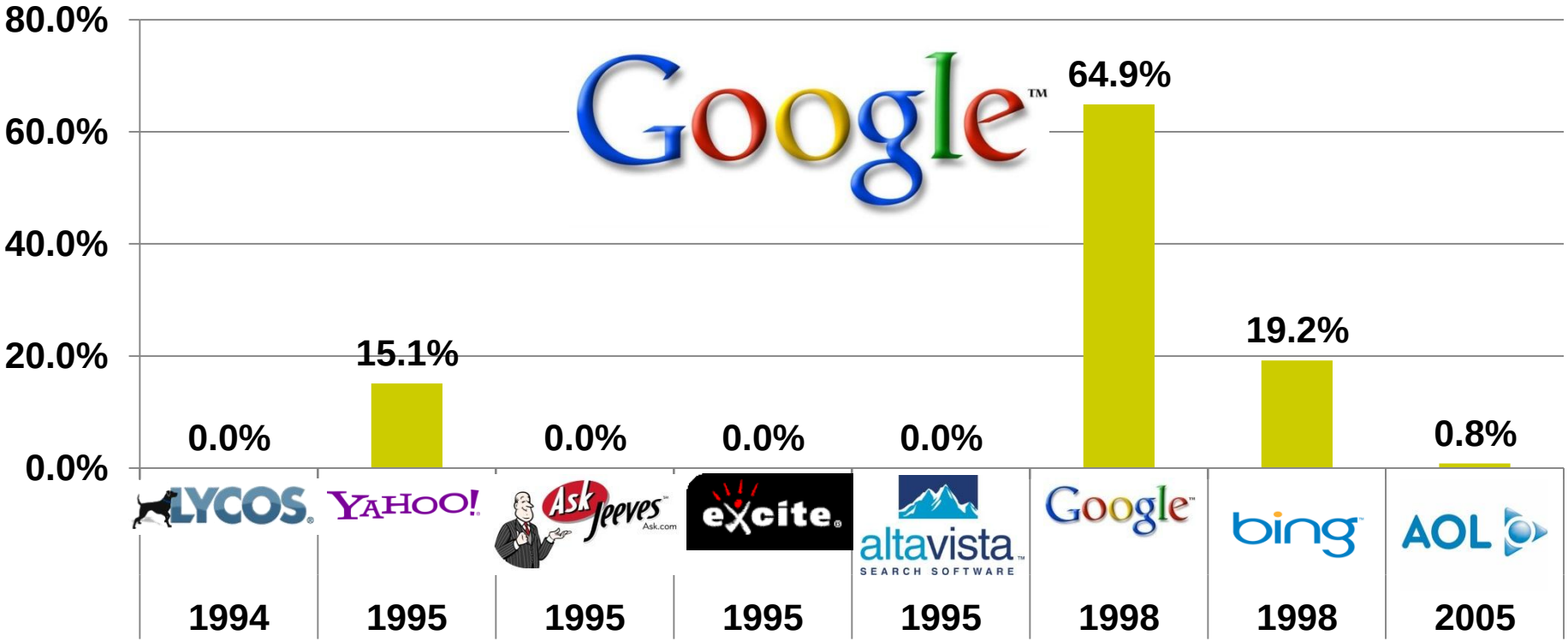
David Stockill
Shell Global Solutions International
12th April 2001

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.

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

US Core Web Search Market Share - Aug 2012

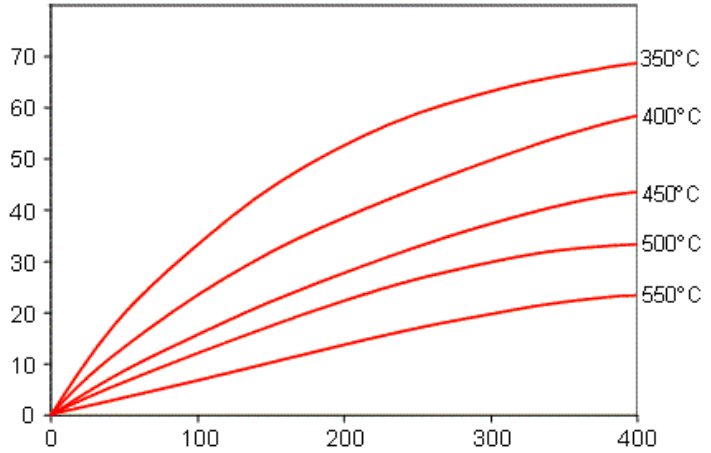


http://finance.boston.com/boston/news/read?GUID=22253566

Google™

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

"This Google Algorithm always works for me!"



- Early to Mid-1980s: started out in Advanced Control
  - Technology: Advanced Control
  - Recognized there was more data than meets the eye (historize the real-time data)

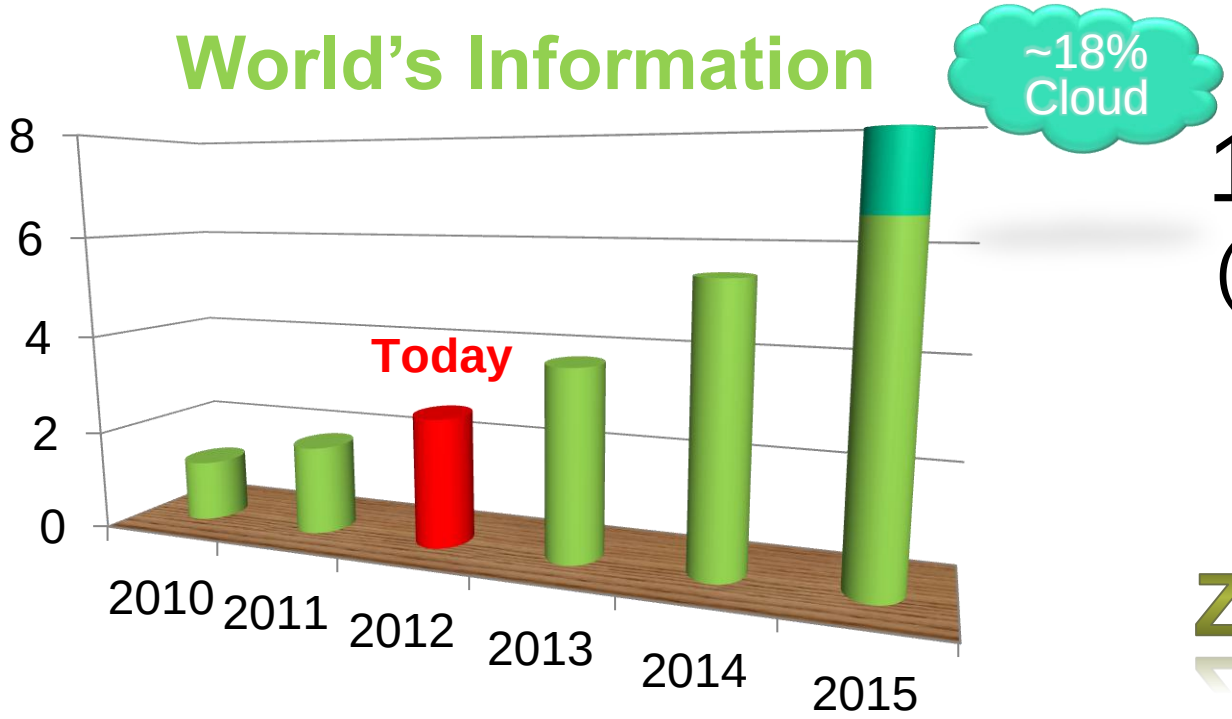
Data

Infrastructure is the most efficient way to deliver services needed by many

Infrastructure

How do we overcome the data challenges?

Big Data



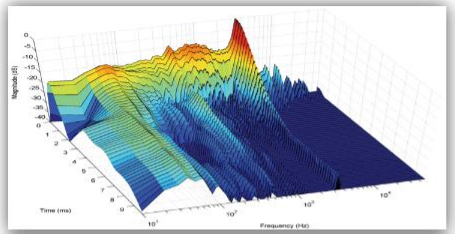
10^{21} bytes
(1 billion TB)

ZETTABYTES

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

PI SERVER 2012

(SCALABILITY: 20+ MILLION PI TAGS)



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

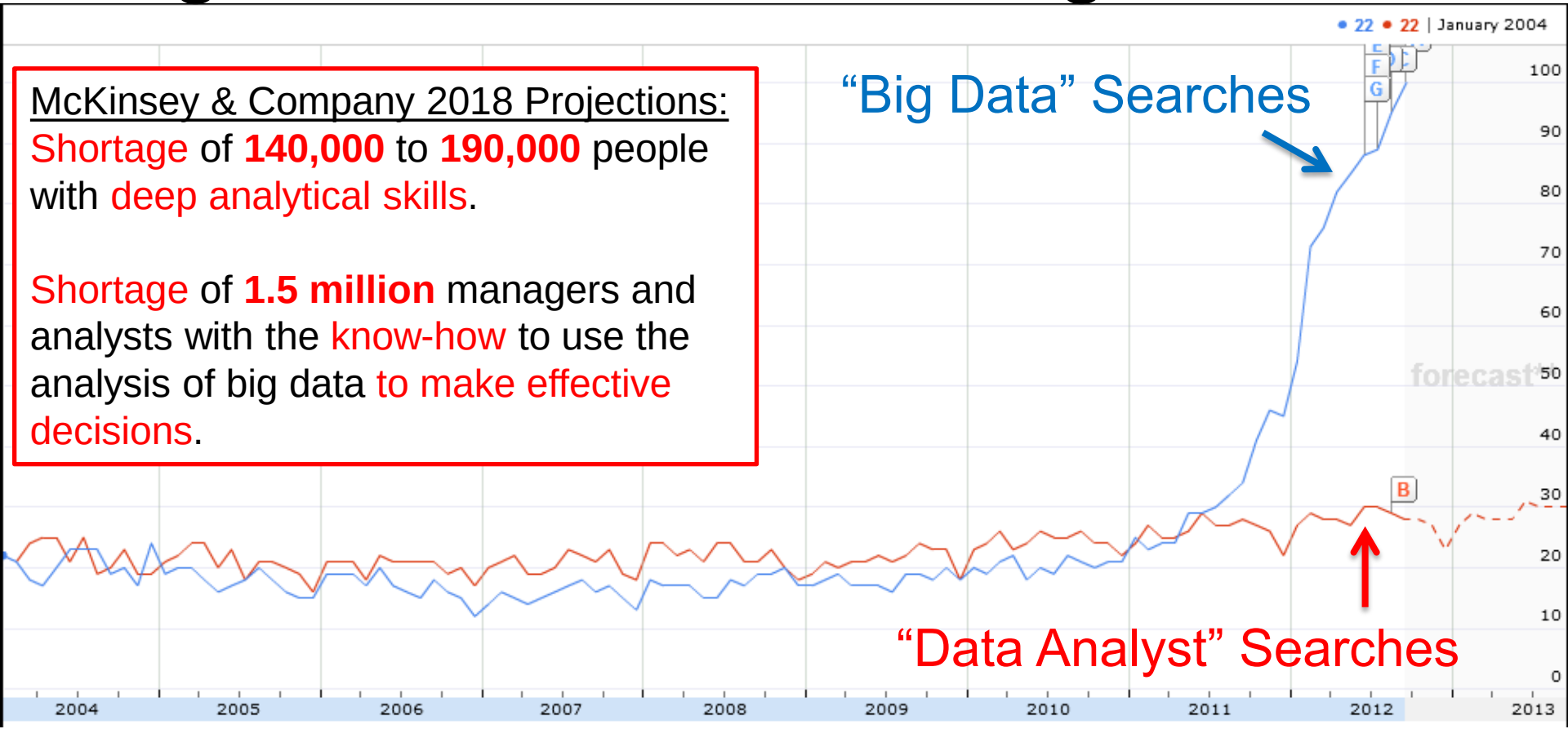
1K assets, 1M points

10 years online

Unique Events: 6,307 Tr

Estimated Data: 50,460TB

Big Data Skills Are Lacking



McKinsey & Company 2018 Projections:
Shortage of **140,000** to **190,000** people with deep analytical skills.

Shortage of **1.5 million** managers and analysts with the know-how to use the analysis of big data to make effective decisions.

Addressing the Data Skills Shortage

STANFORD UNIVERSITY

Stanford Center for Professional Development

Data Mining and Analysis

STATS202

▶ Online

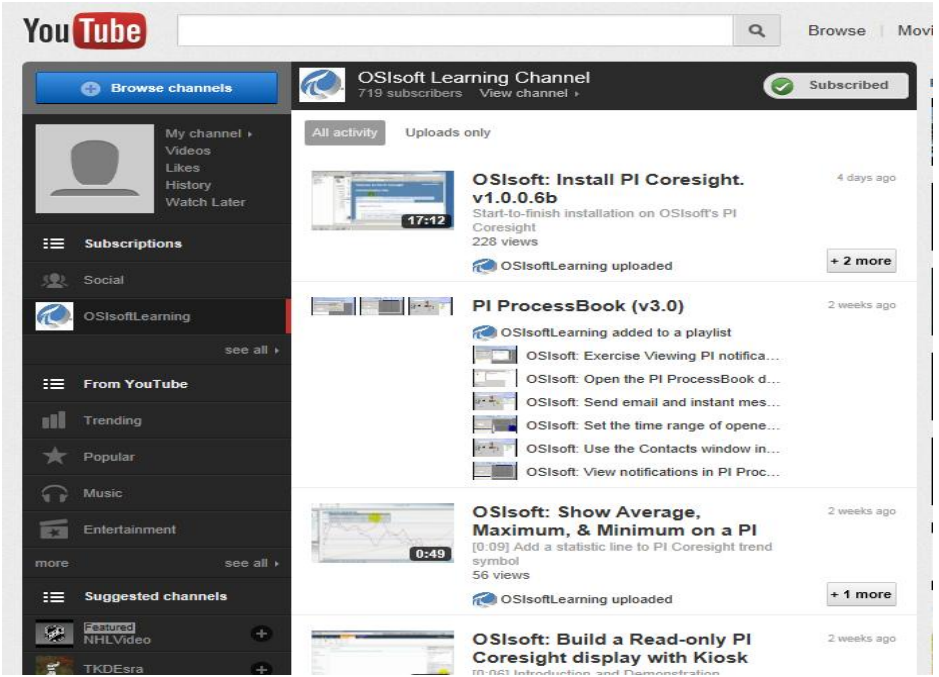
Description

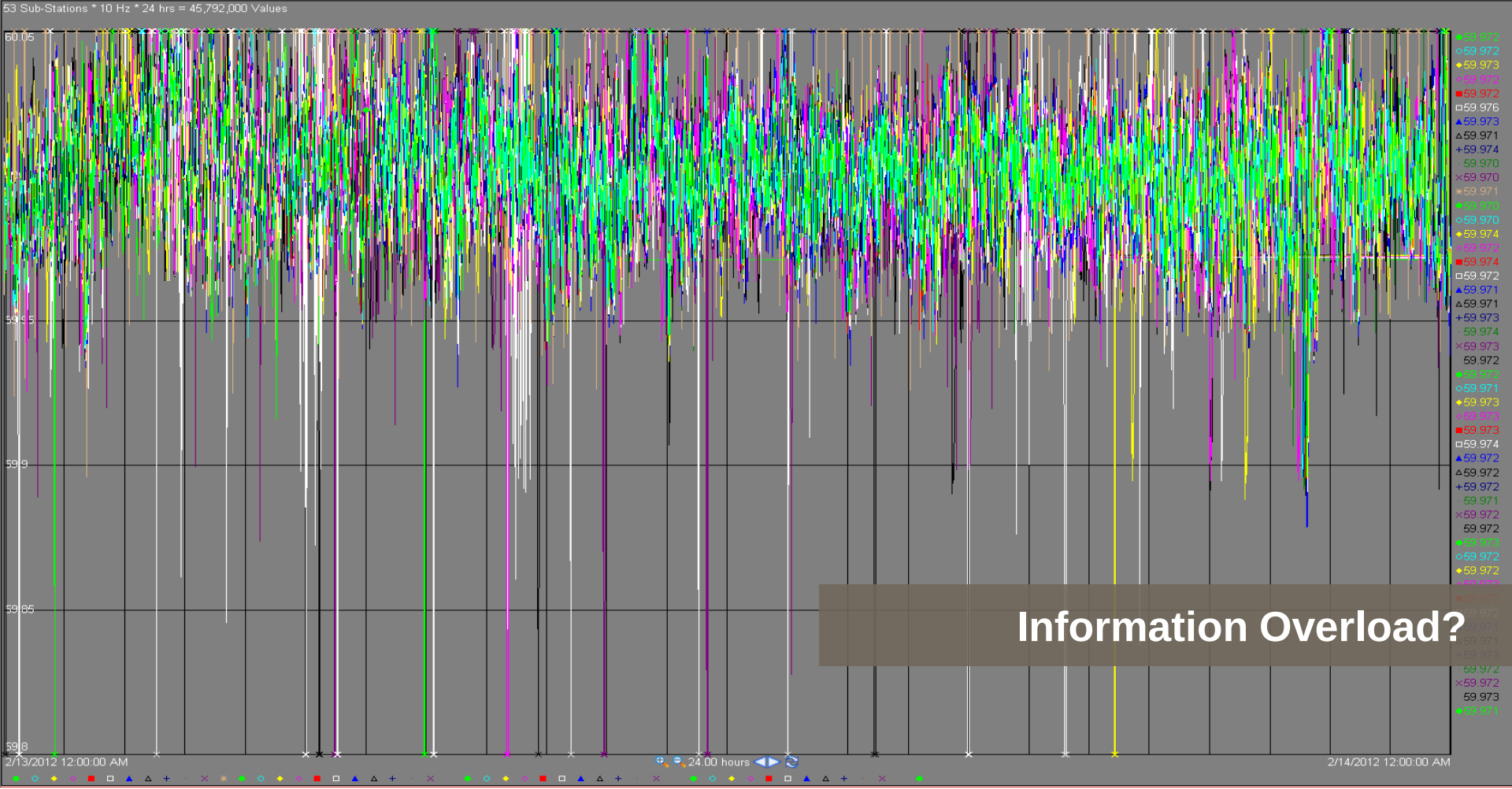
In the Information Age, there is an unprecedented amount of data being collected and stored — by banks, supermarkets, internet retailers, security services, etc. So, now that we have all this data, what do we with it?

The discipline of data mining and analysis provides crunchers with the tools and framework to discover meaningful patterns in data sets of any size and scale. It allows us to turn all this data into valuable, actionable information. In this course, learn how to explore, analyze, and leverage data.

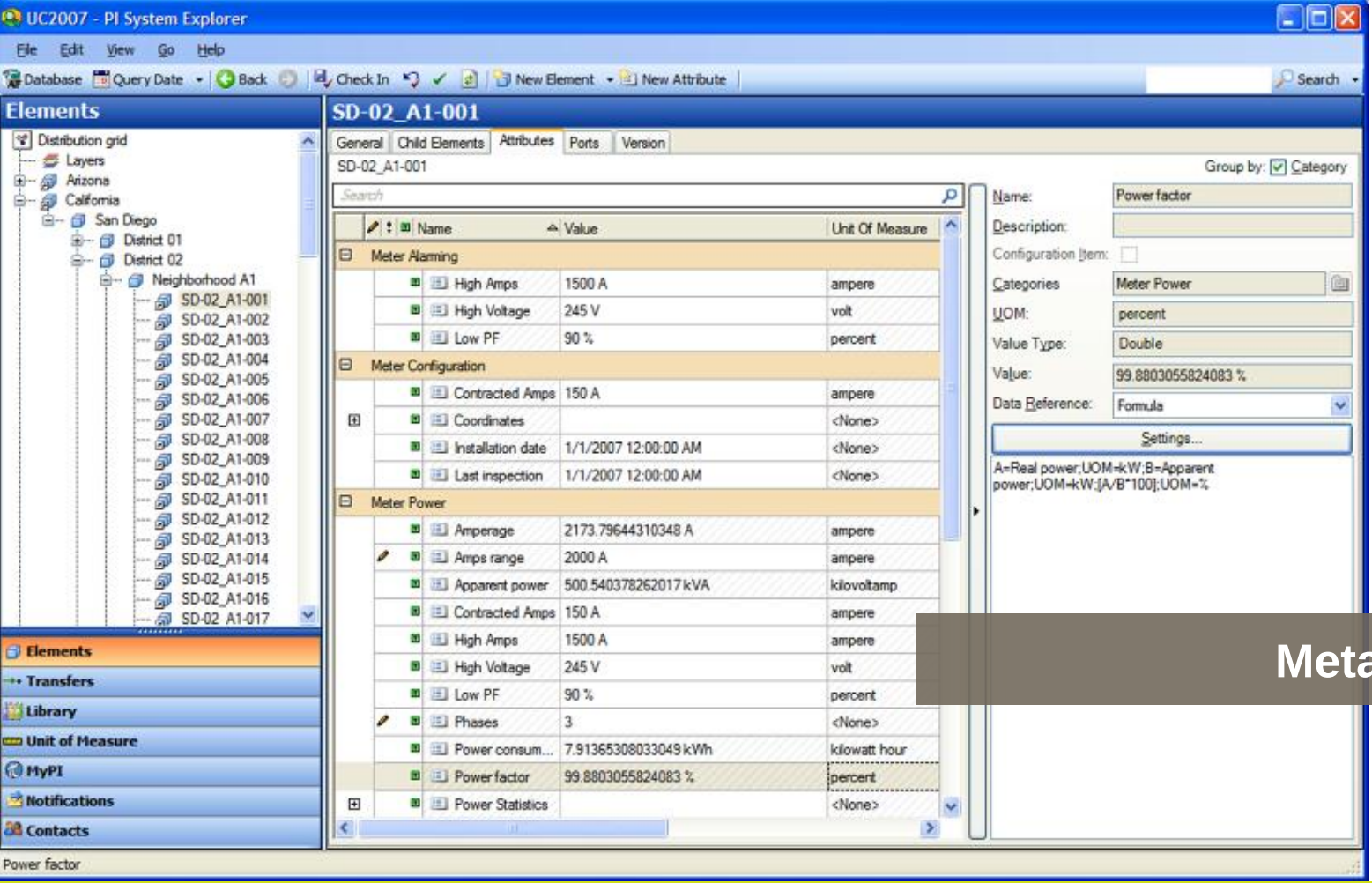
Topics Include

- Decision trees
- Neural networks
- Association rules
- Clustering
- Case-based methods
- Data visualization



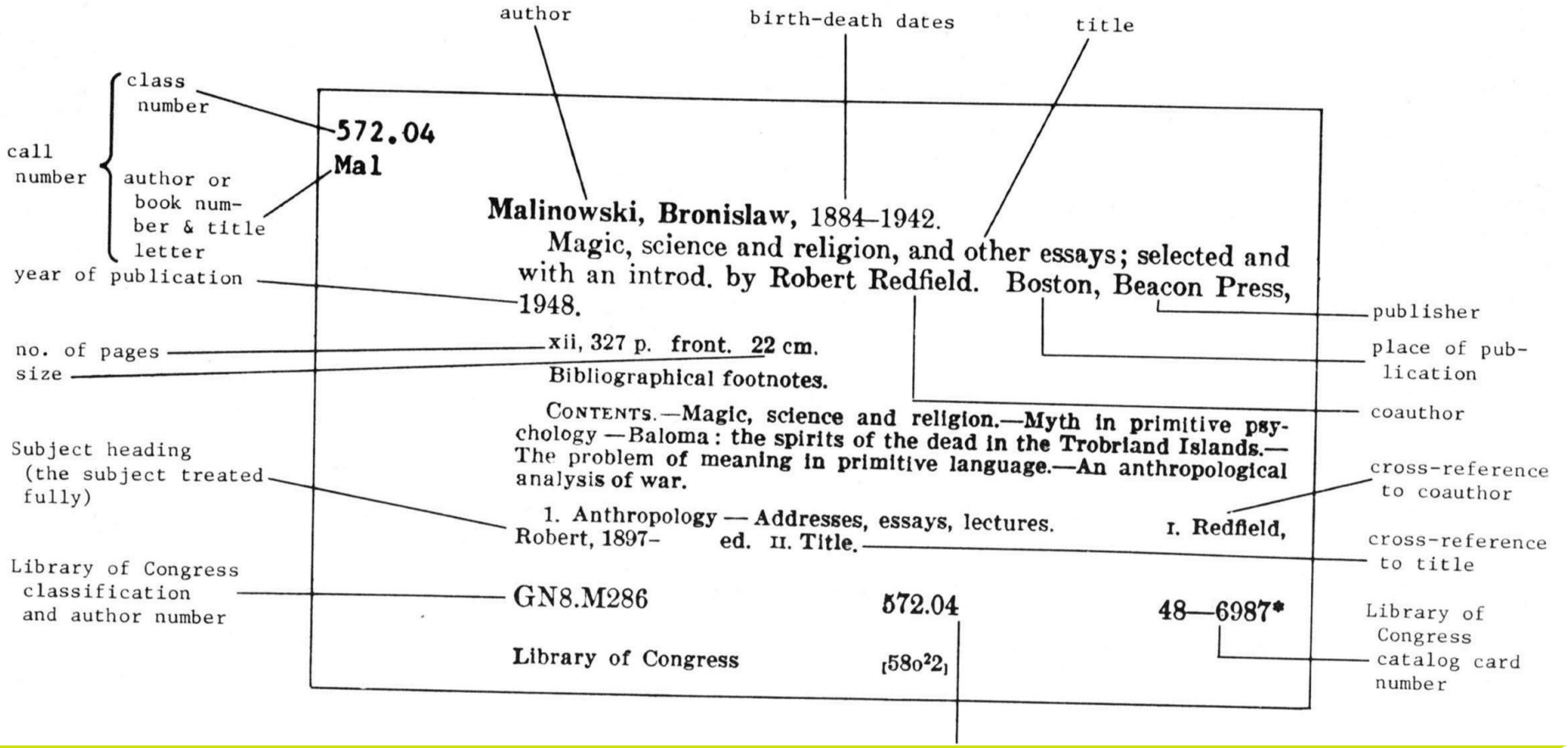


Metadata (Card Catalog)



Metadata (PI AF)

Metadata (Card Catalog)

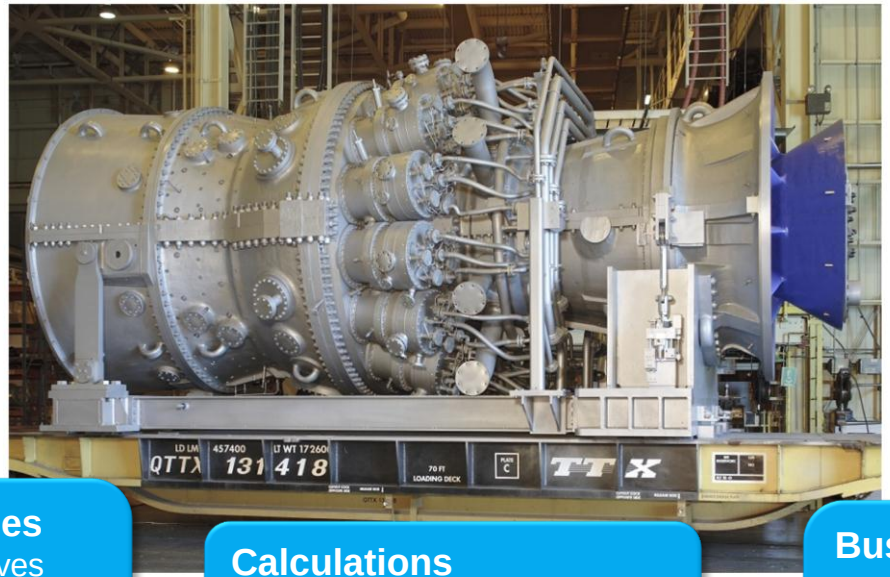


PI AF: A Complete Picture of Your Asset

Real-time Values
- Inlet pressure
- Inlet flow
- Ambient temperature

Asset Details
- Name
- Make
- Model

External Databases
- Performance curves
- Last service date
- Design documents
- Inspection best practice



Calculations
- Performance calculations
- KPI's

Real-time Values
- Exhaust temperature
- Exhaust flow
- Measured MW output

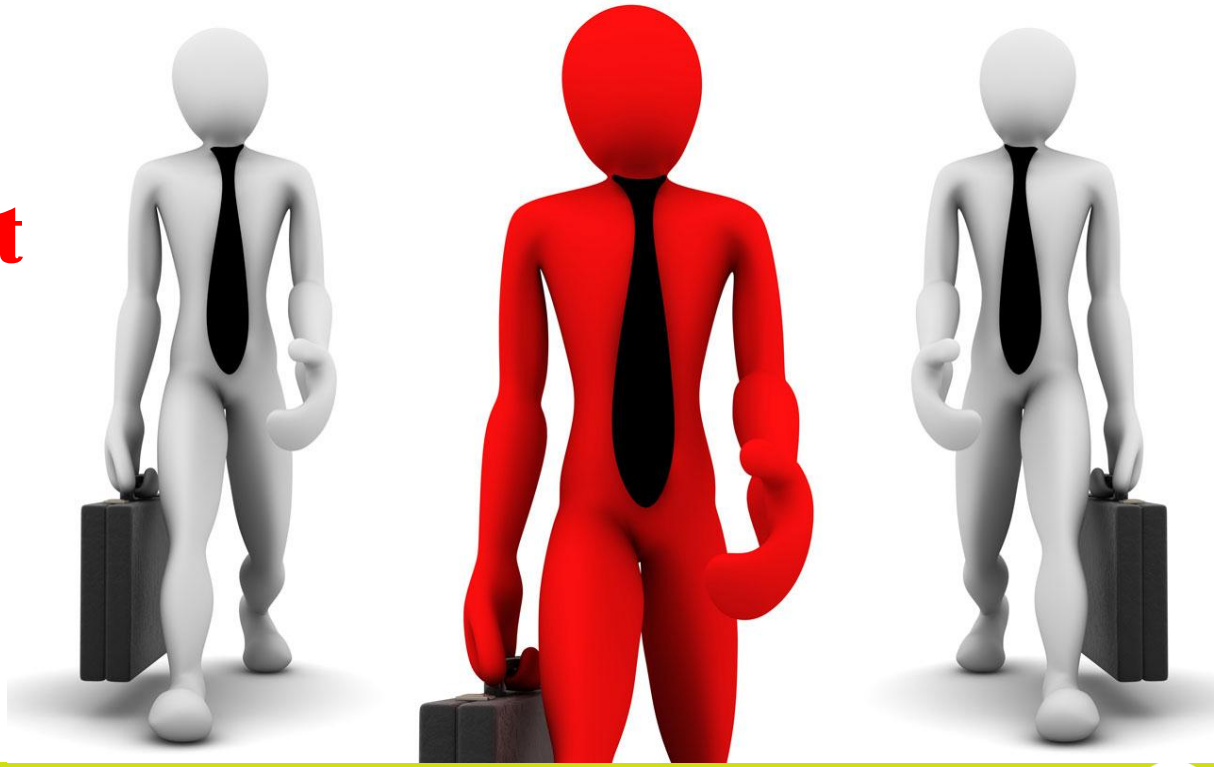
Notifications
- Performance excursions
- Temperature difference
- High temperature

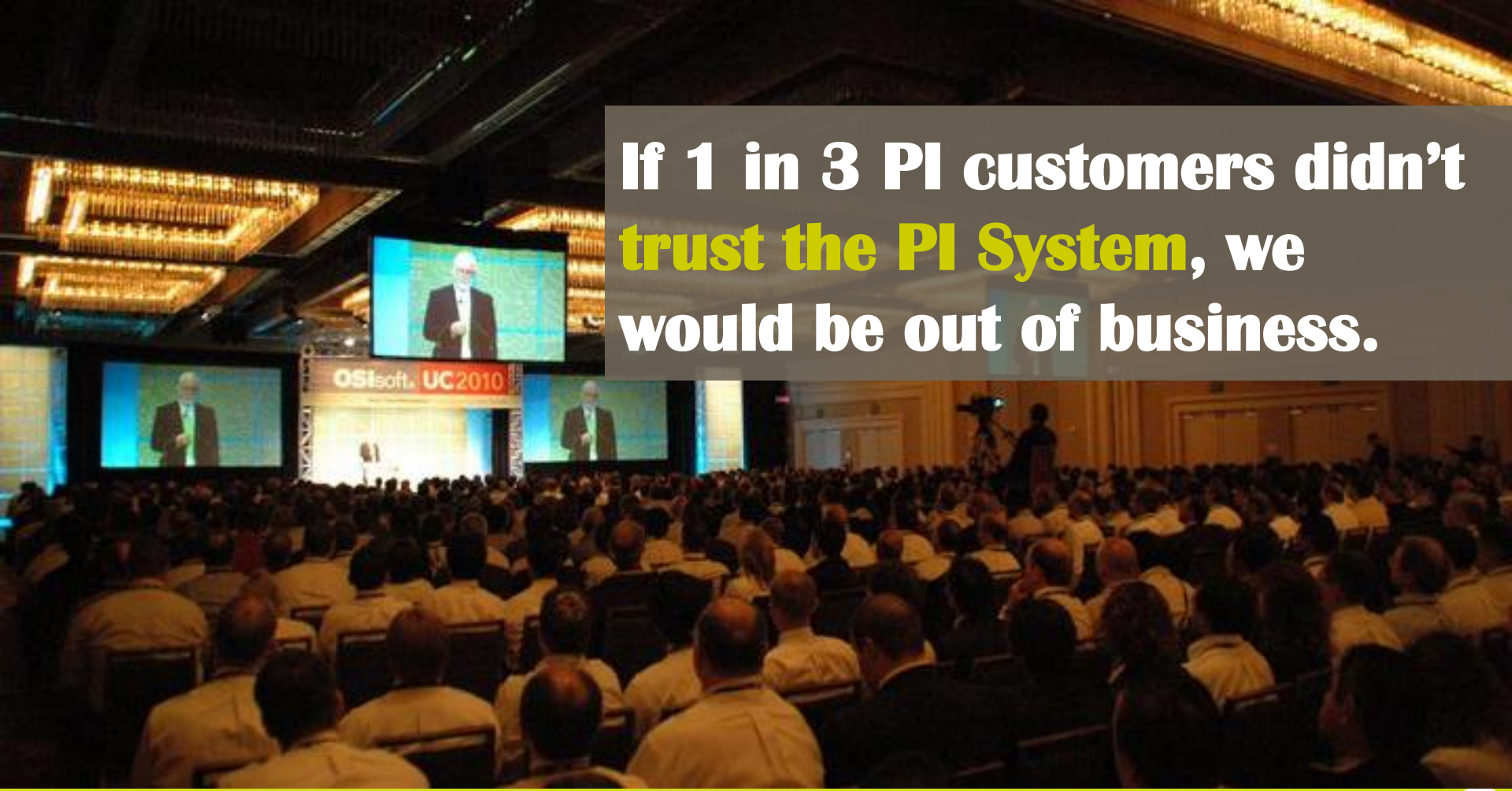
Business Events
- Downtime
- Startups
- Shutdowns
- Excursions

Trust the Data

"1 in 3 business leaders don't trust the information they use to make decisions."

IBM

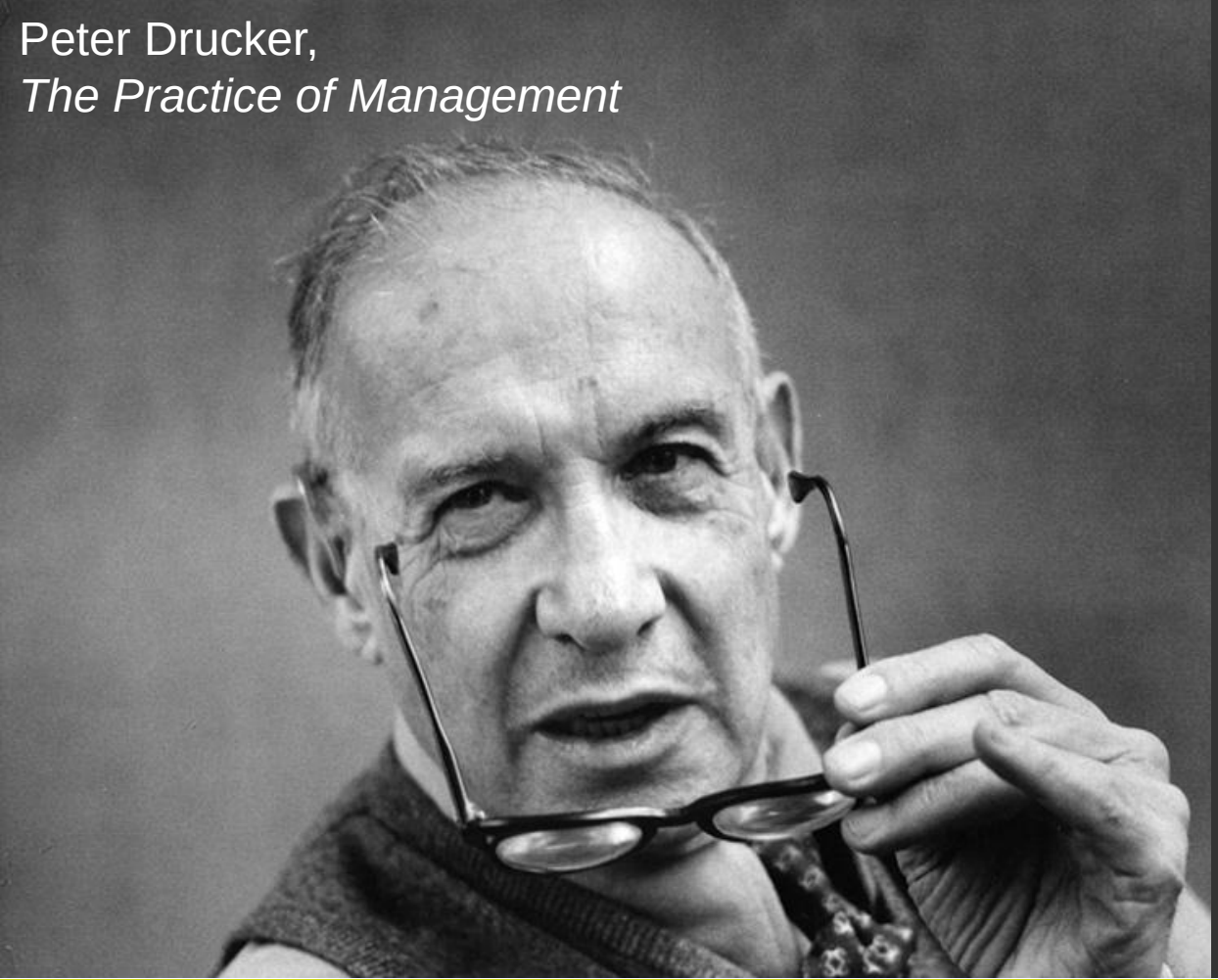




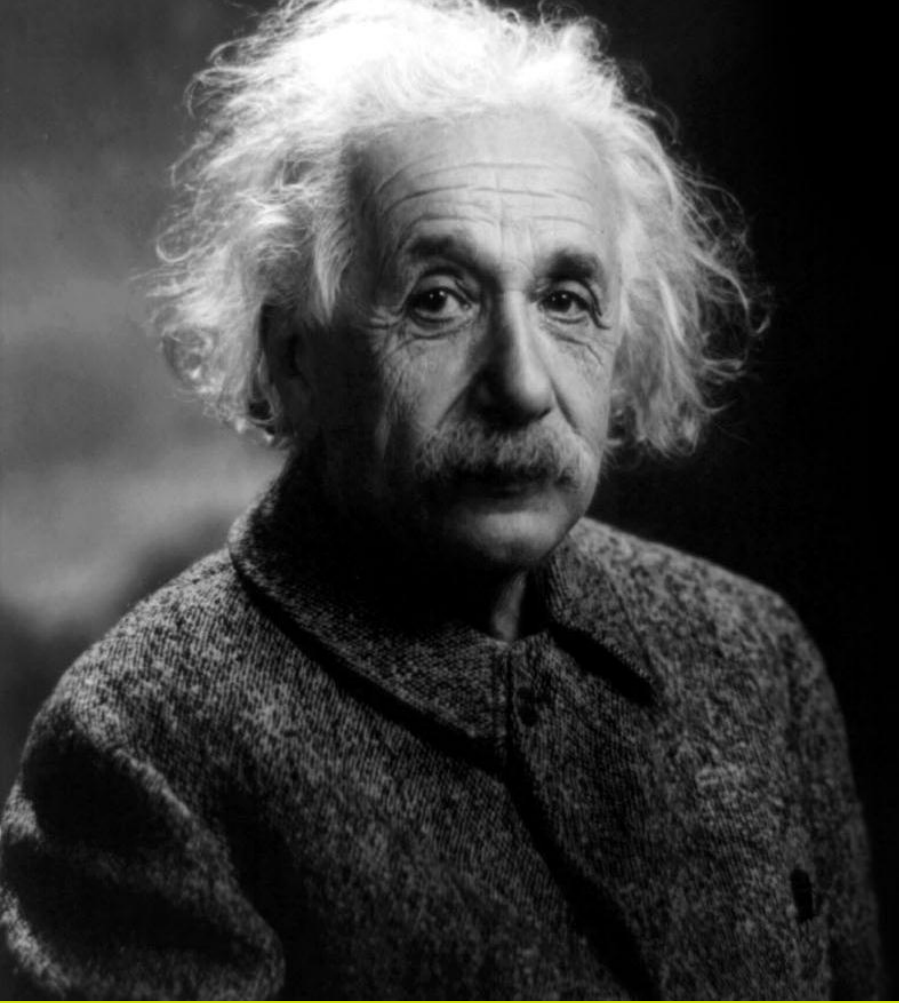
If 1 in 3 PI customers didn't trust the PI System, we would be out of business.

What are the keys to realizing & unlocking the power of data?

Peter Drucker,
The Practice of Management



"The important and difficult job is never to find the right answers, it is to find the right question."



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

Albert Einstein

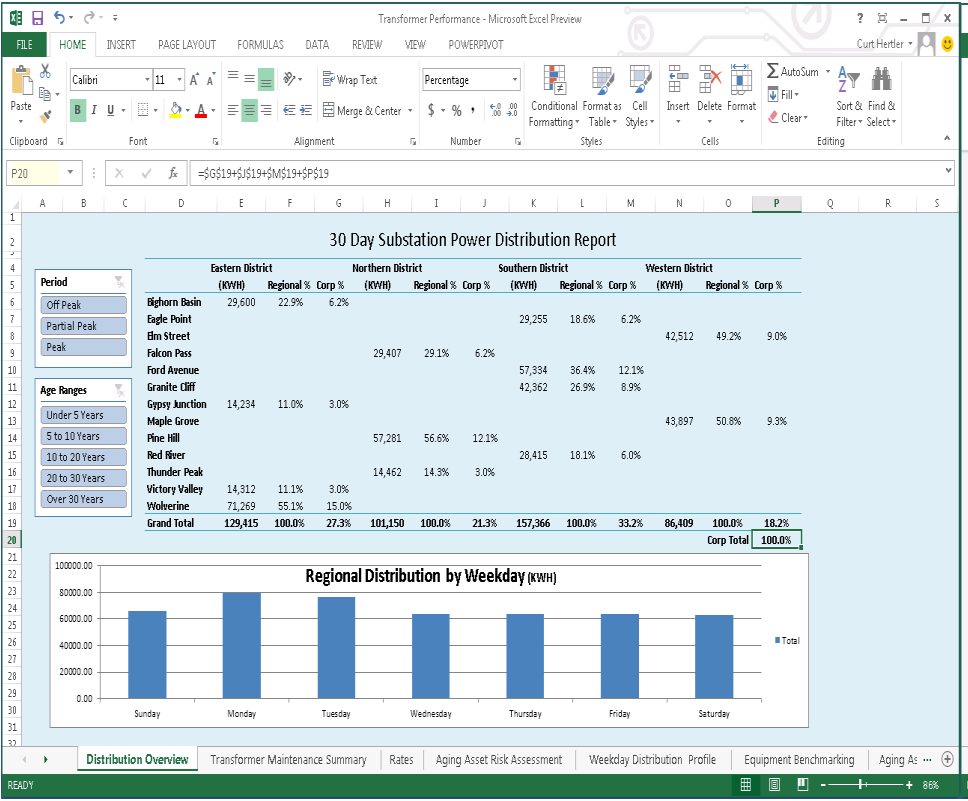
"It [Big Data] has great potential for good—as long as consumers, companies and governments make the right choices about when to restrict the flow of data, and when to encourage it."

"The data deluge", Feb 25, 2010
The Economist

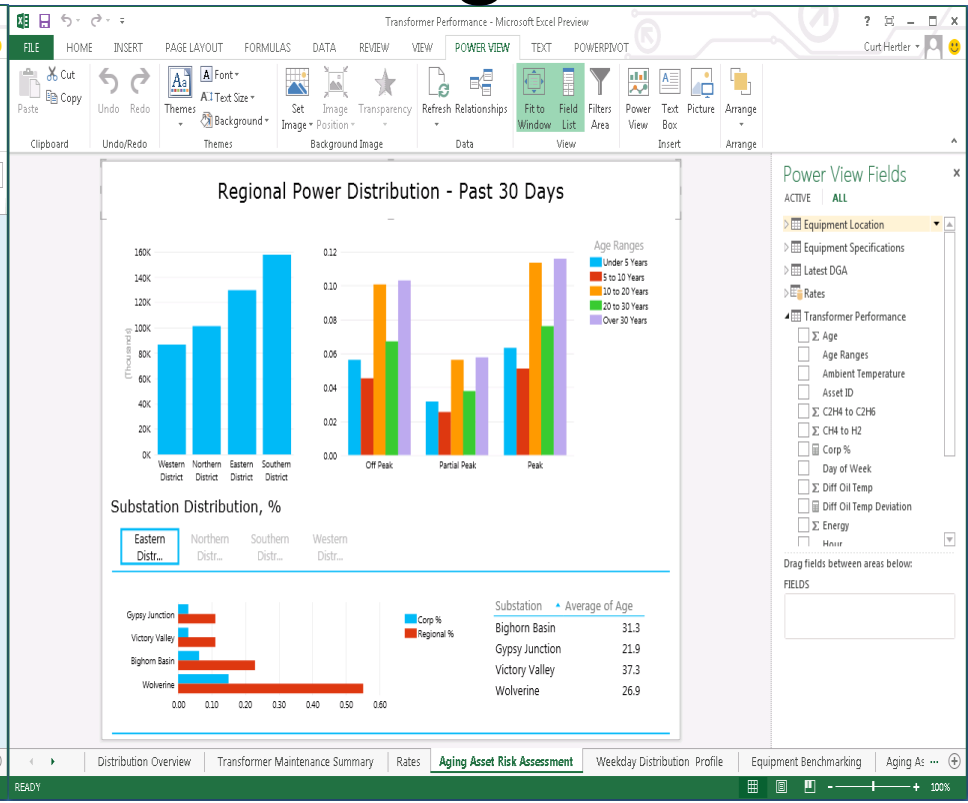
ALL the DATA

Technology & Skills

Microsoft Business Intelligence



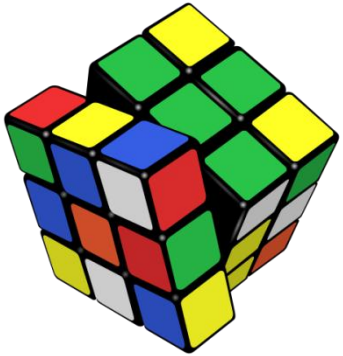
PowerPivot

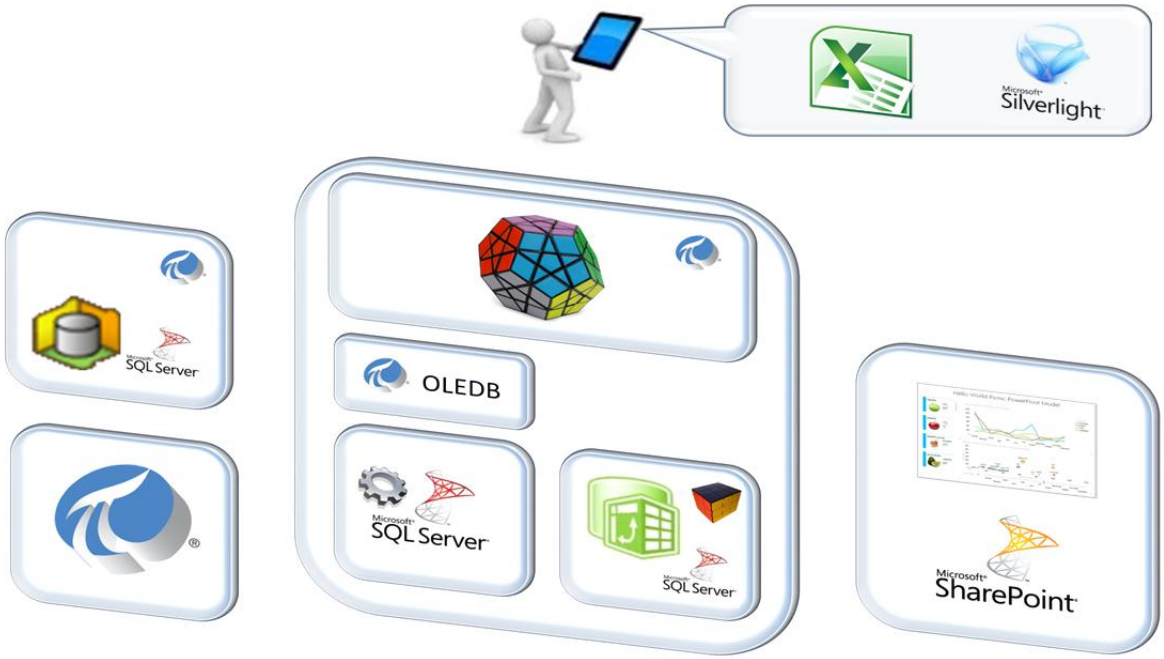


Power View

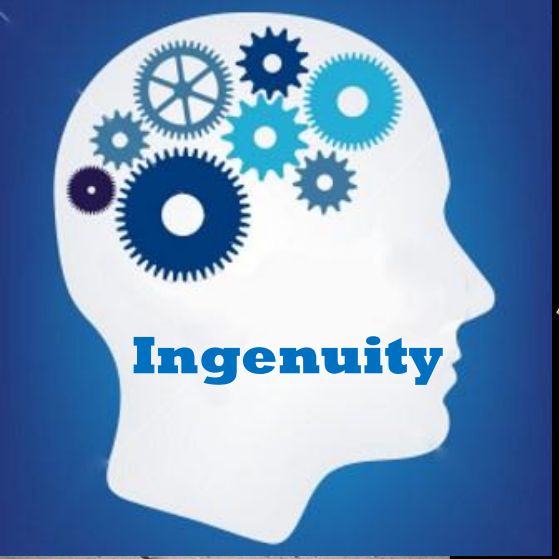
OSIsoft: Project Rubik

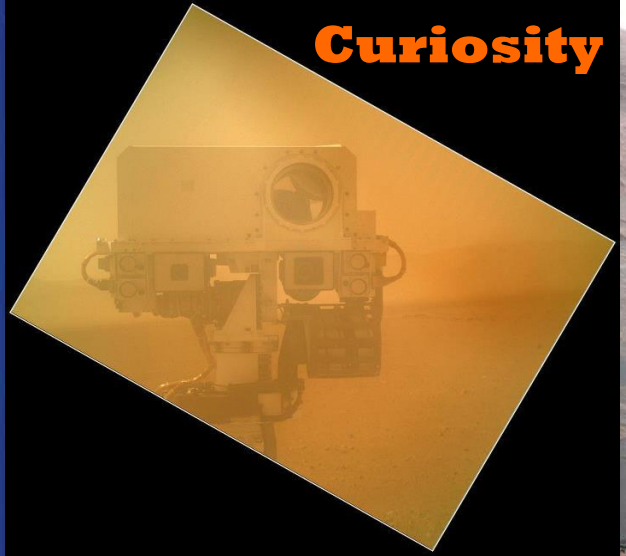
Goal: Integrate PI System Data with Microsoft BI

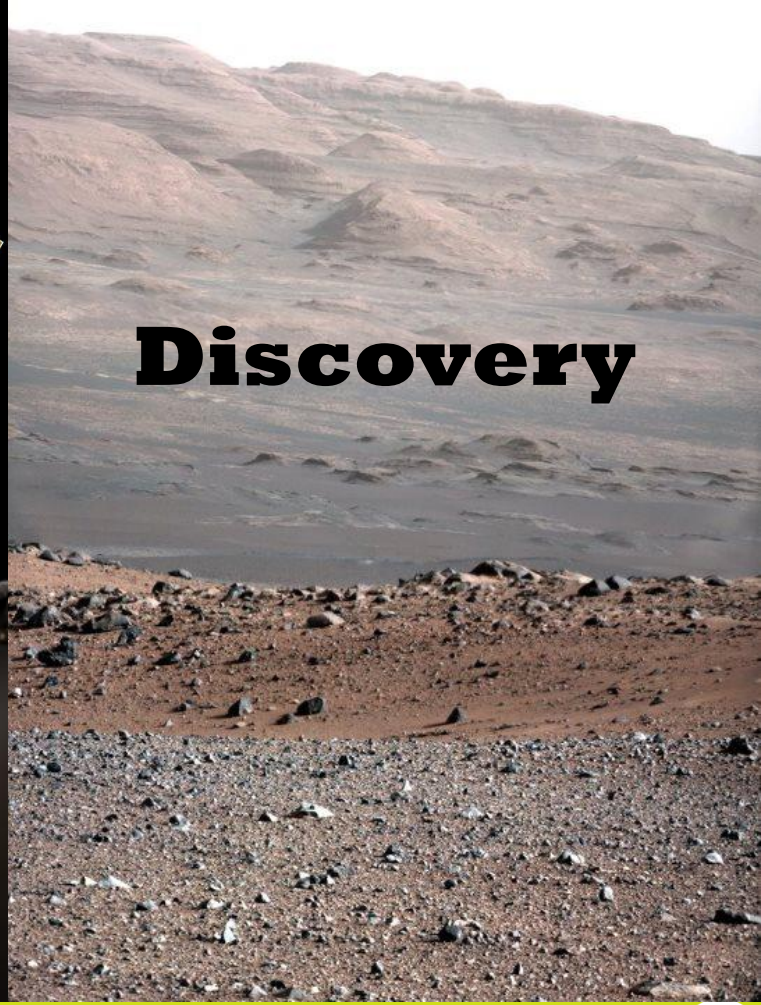




- Bridge the Gap
- Auto-build BI models
- Proper data aggregation







Google™

VISA WAL*MART ALWAYS LOW PRICES. Always amazon.com.

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

NALCO AEP®

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"Big Data" Searches

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PI SERVER

(SCALABILITY: 20+ MILLION

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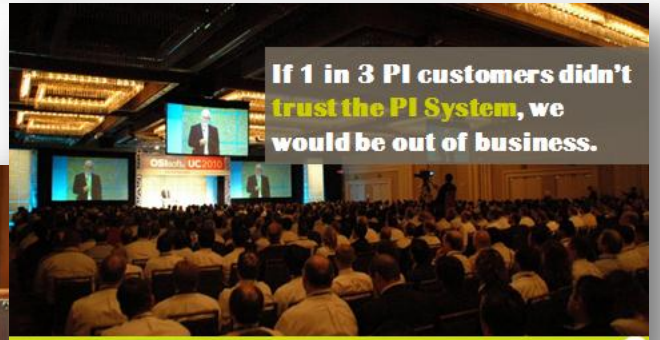

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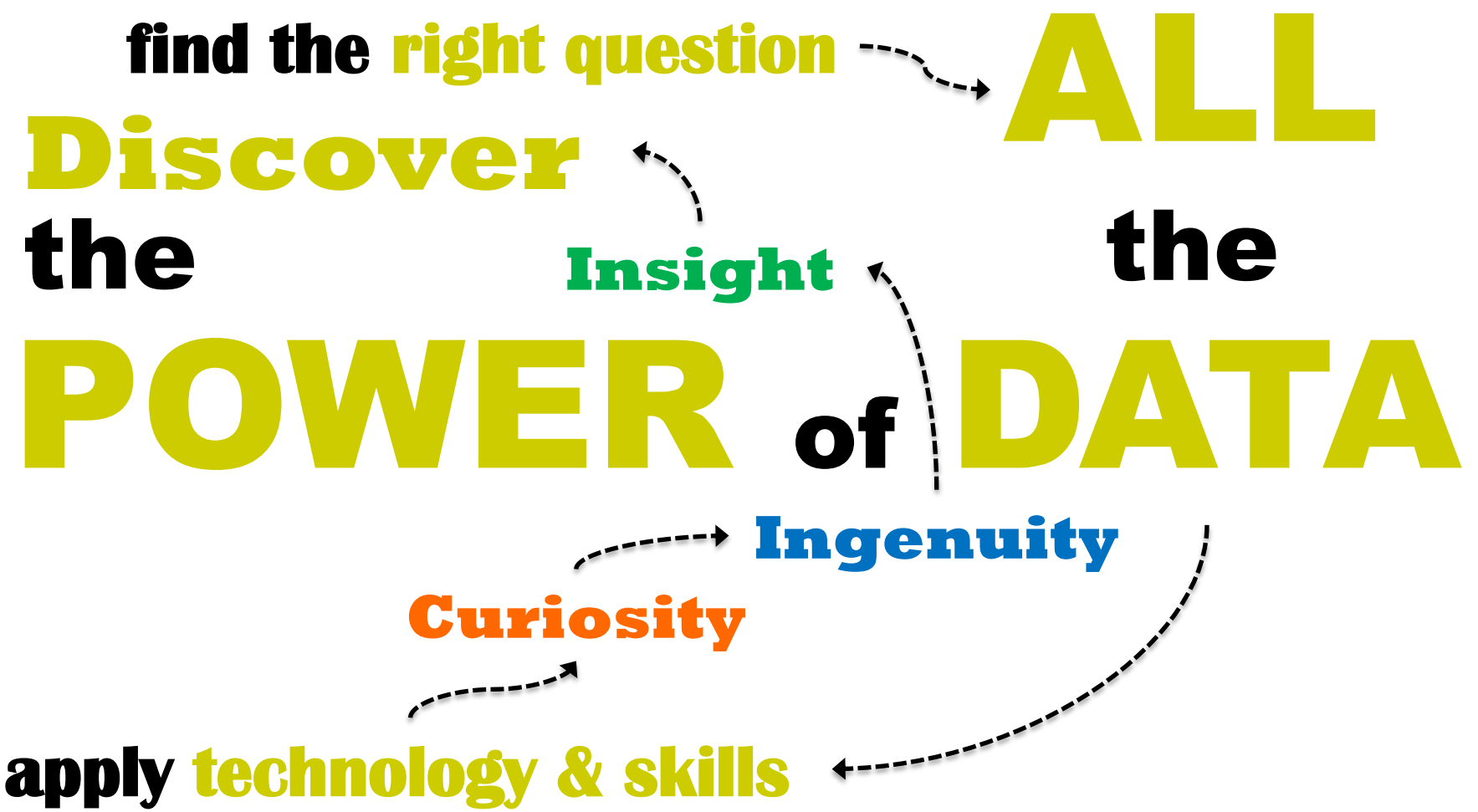

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