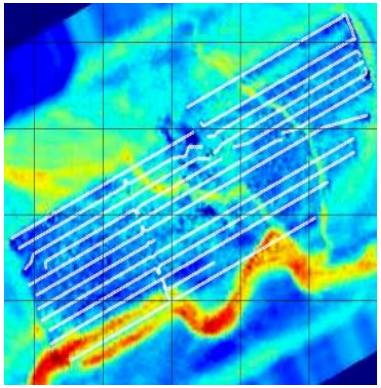
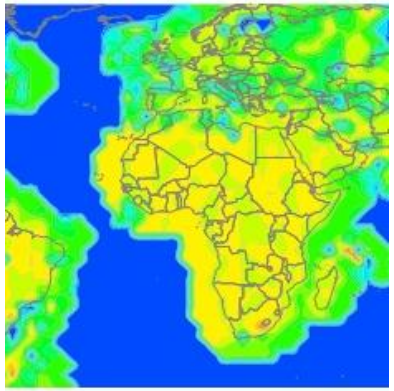
Prioritizing Drilling Data in a Price Downturn

PPDM™

The Professional Petroleum Data Management (PPDM) Association



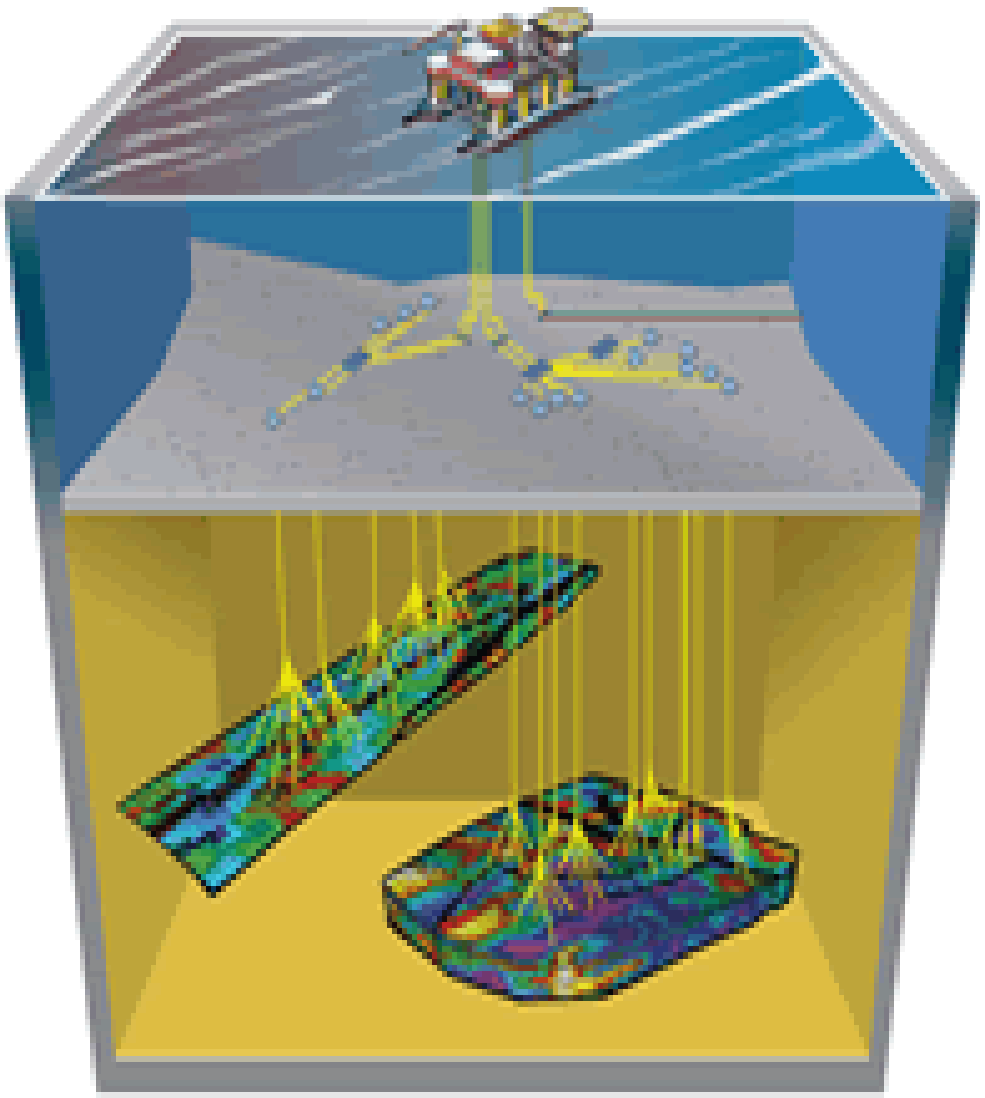


Jess B. Kozman
Data Management Practitioner
Singapore

APO Offshore

CLTech Consulting
Data Management Practitioners

Activity Domains



Surface: Reduce Risk

- Facilities
- Engineering
- Production
- QSHE
- Finance
- Legal
- Compliance
- Operations
- Drilling
- Reserves
- Economics

SubSurface: Increase Revenue

- Geology
- Geophysics
- Reservoir Engineering
- Completions
- Testing
- Logging
- Models
- Simulation

Source: http://www.energistics.org/Assets/strategic-role-of-the-ndr-in-the-netherlands.pdf

Setting the Scene

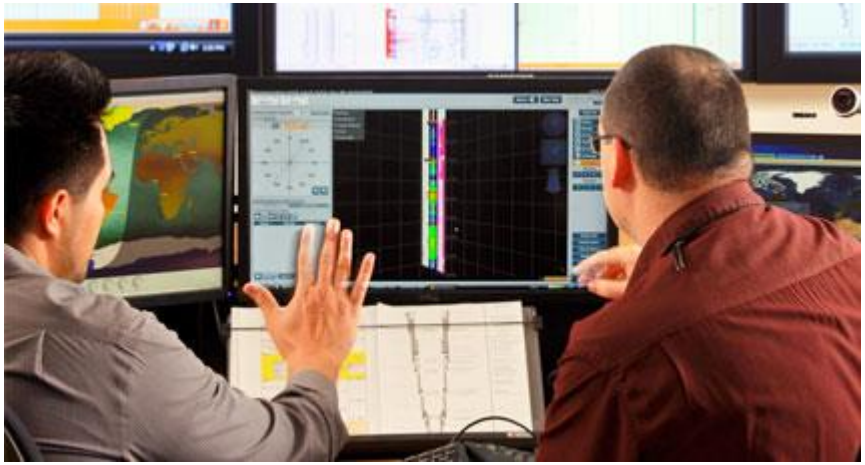
- Acceptable non-productive time offshore between **4.9% and 5.8%,** depending on age of asset.
- Actual non-productive time between **7.9% and 21.3%**
  - Athens Group, 2012

Typical Hourly Cost of Downtime by Industry (in US Dollars)	
Brokerage Service	6.48 million
Energy	2.8 million
Telecom	2.0 million
Manufacturing	1.6 million
Retail	1.1 million
Health Care	636,000
Media	90,000

Sources: Network Computing, the Meta Group and Contingency Planning Research.

- 50% of oil and gas companies will have advanced predictive analytics and asset integrity capabilities by 2016
  - IDC Energy Insights Webinar

Drilling Data: The Prize

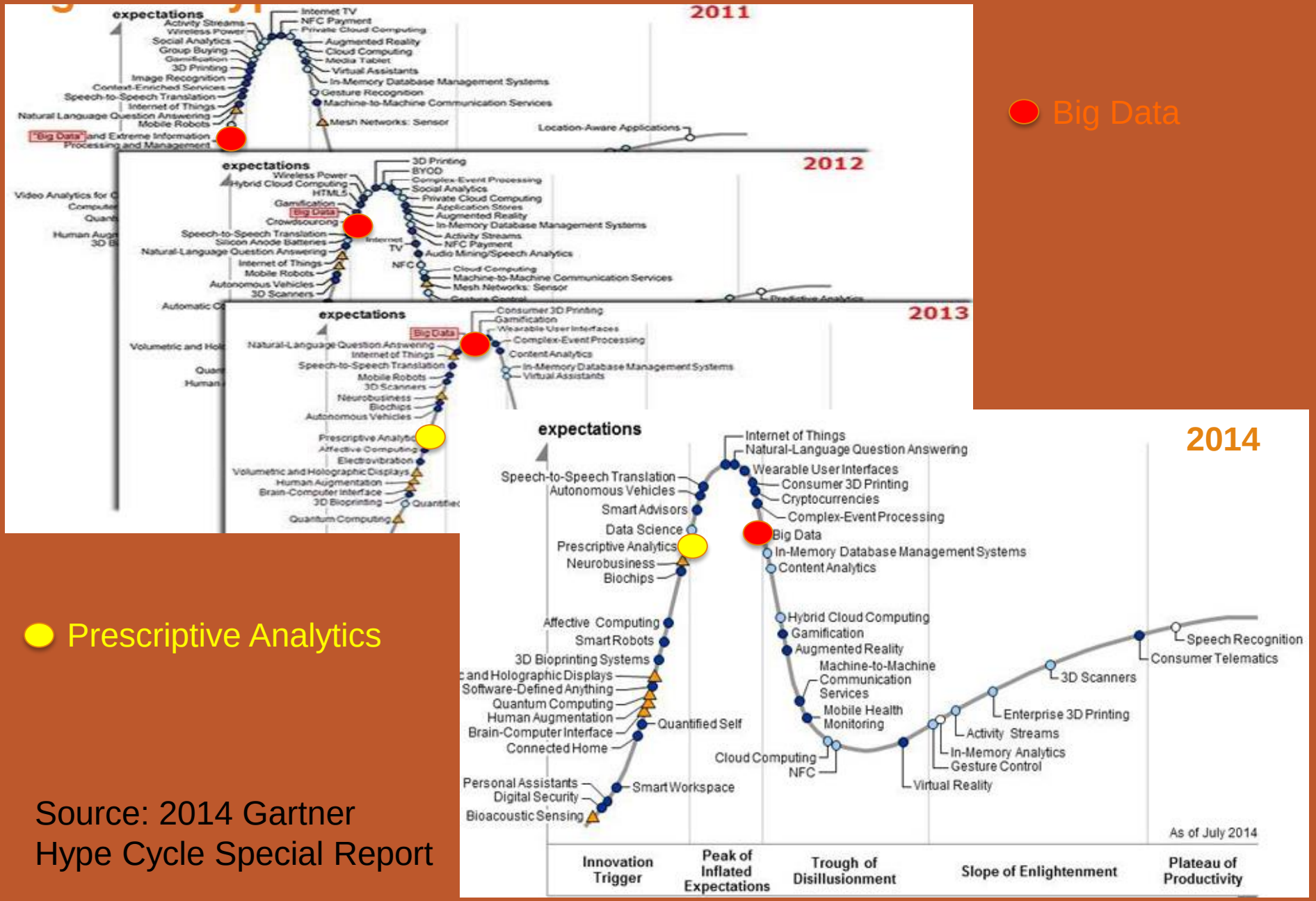


25% in operating cost savings
8% higher production rates
2 - 4 % lower project costs
6% improved resource recovery

Enhanced recovery: 125 billion BOE
Lower operating costs: $4-8 billion/year
Increased production rates: increase utilization 2-6%
Lower facilities cost: 5-10% (3-5 years)
Decreased drilling costs: 5-15%

Source: “The Digital Oilfield of the Future: Enabling Next Generation Reservoir Performance,” Cambridge Energy Research Associates, Inc., 2003.

Big Data from Drilling?



Big Data

Prescriptive Analytics

Source: 2014 Gartner
Hype Cycle Special Report

Data

0.8 – 0.9
0.75 – 0.8
0.6 – 0.9
30 – 75
2.69
1.53 – 1.6

1051
207800
2
55103
4334
9036

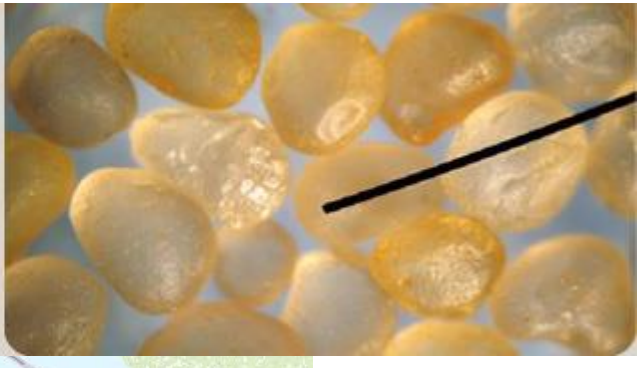
Information

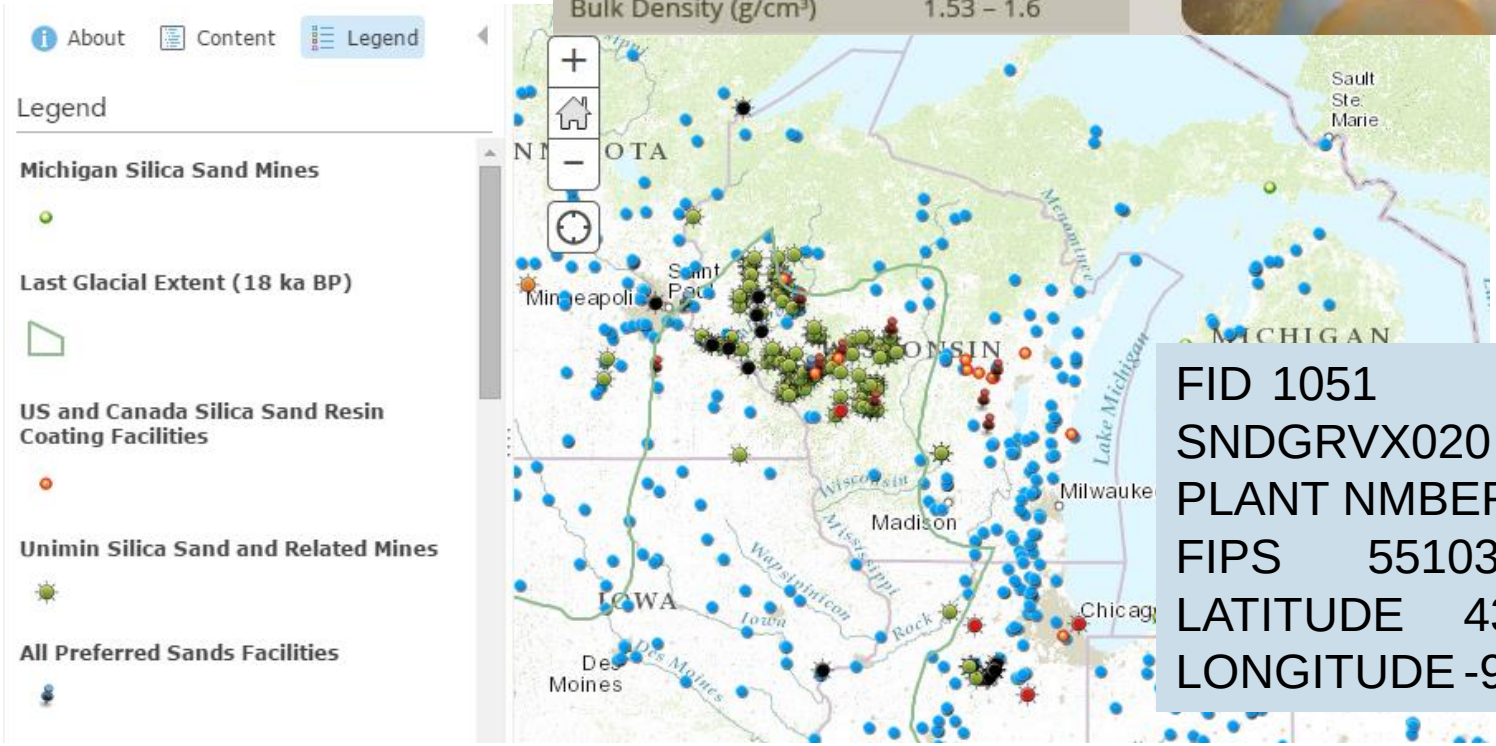
Krumbein Roundness	0.8 – 0.9
Krumbein Sphericity	0.75 – 0.8
Acid Solubility (%)	0.6 – 0.9
Turbidity (FTU/NTU)	30 – 75
Specific Gravity (g/cm³)	2.69
Bulk Density (g/cm³)	1.53 – 1.6

FID 1051
SNDGRVX020 2,078.00
PLANT NMBER 2
FIPS 55103
LATITUDE 43.34
LONGITUDE -90.36

Knowledge

TYPICAL PROPERTIES	ISO 13503 – 2
Krumbein Roundness	0.8 – 0.9
Krumbein Sphericity	0.75 – 0.8
Acid Solubility (%)	0.6 – 0.9
Turbidity (FTU/NTU)	30 – 75
Specific Gravity (g/cm³)	2.69
Bulk Density (g/cm³)	1.53 – 1.6

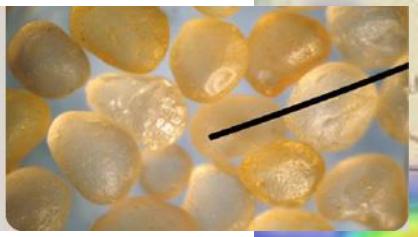


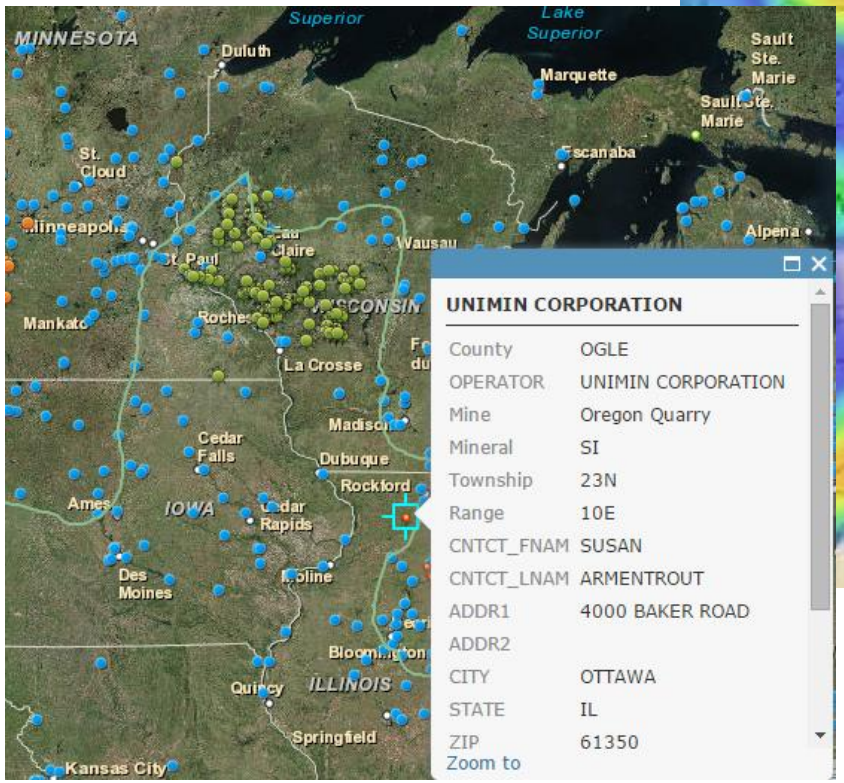


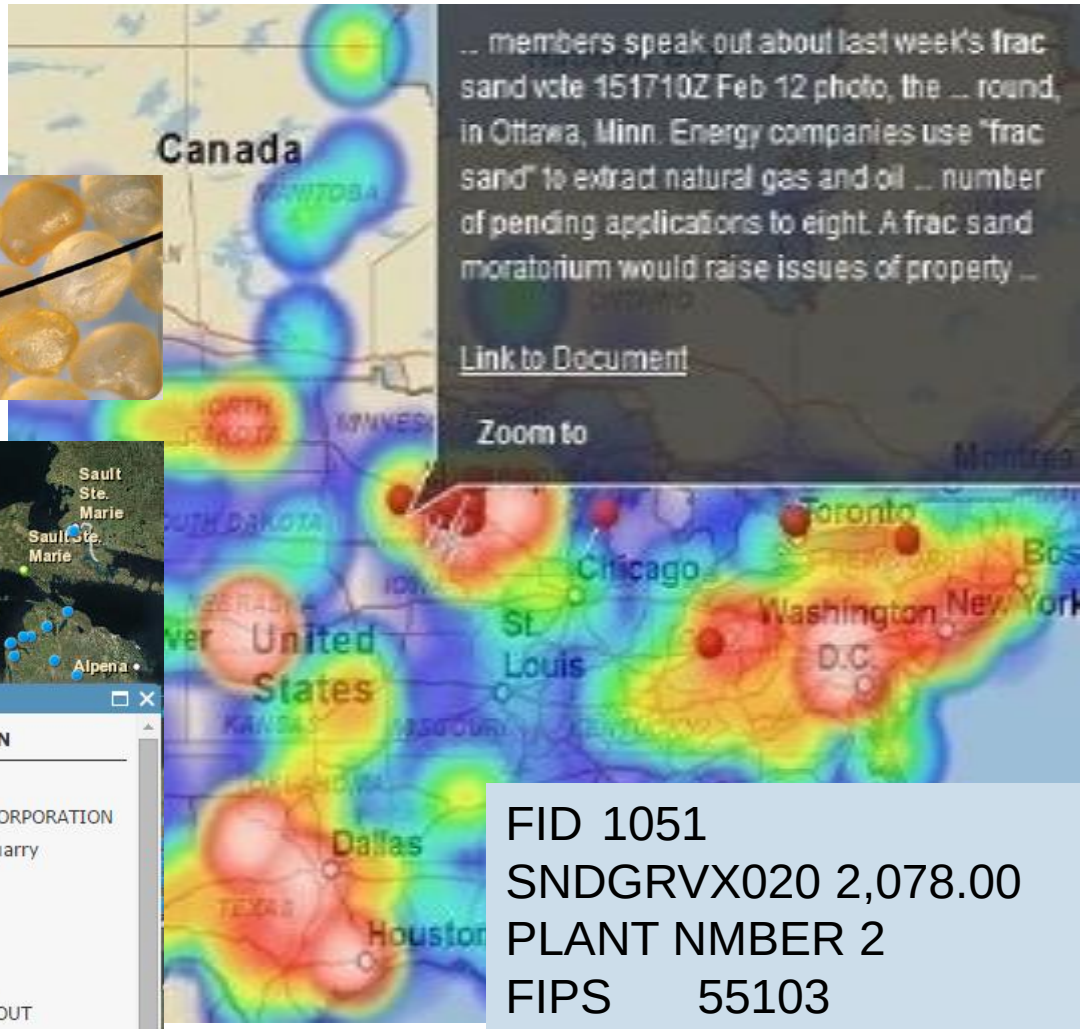
FID 1051
SNDGRVX020 2,078.00
PLANT NMBER 2
FIPS 55103
LATITUDE 43.34
LONGITUDE -90.36

Intelligence

TYPICAL PROPERTIES	ISO 13503 – 2
Krumbein Roundness	0.8 – 0.9
Krumbein Sphericity	0.75 – 0.8
Acid Solubility (%)	0.6 – 0.9
Turbidity (FTU/NTU)	30 – 75
Specific Gravity (g/cm³)	2.69
Bulk Density (g/cm³)	1.53 – 1.6





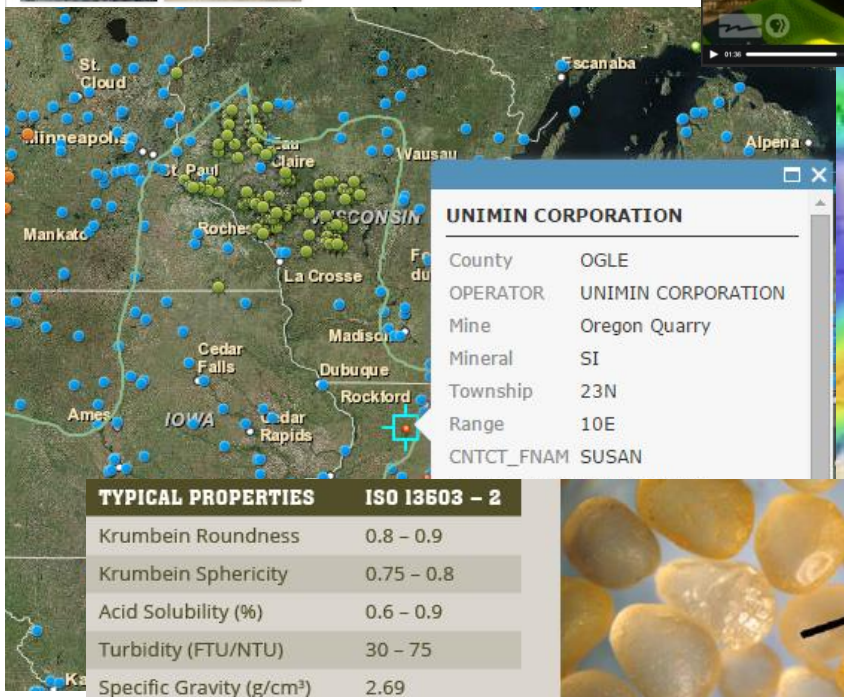


FID 1051
SNDGRVX020 2,078.00
PLANT NMBER 2
FIPS 55103
LATITUDE 43.34
LONGITUDE -90.36

Analytics

Three more companies want sand mines in Chippewa County

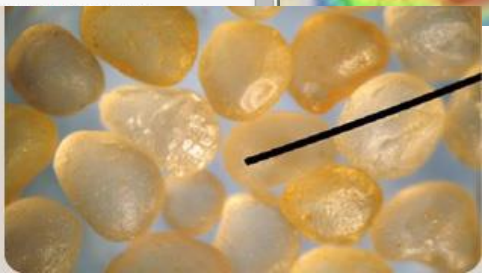
Recommend 0 Tweet 1 g+1 0 Pin it Share 10



UNIMIN CORPORATION

County	OGLE
OPERATOR	UNIMIN CORPORATION
Mine	Oregon Quarry
Mineral	SI
Township	23N
Range	10E
CNTCT_FNAM	SUSAN

TYPICAL PROPERTIES	ISO 13503 – 2
Krumbein Roundness	0.8 – 0.9
Krumbein Sphericity	0.75 – 0.8
Acid Solubility (%)	0.6 – 0.9
Turbidity (FTU/NTU)	30 – 75
Specific Gravity (g/cm³)	2.69
Bulk Density (g/cm³)	1.53 – 1.6



FID 1051
SNDGRVX020 2,078.00
PLANT NMBER 2
FIPS 55103
LATITUDE 43.34
LONGITUDE -90.36

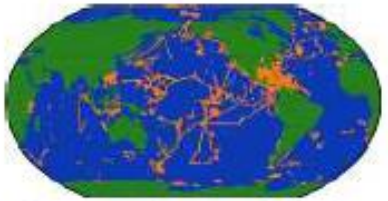
Oil & Gas Drilling Data: 4 P's

Propagation - distribution and duplication by iterative workflows in disparate disciplines

Variety x Volume

Proliferation - rapid multiplication in specialized tools with contradictory interpretations

Velocity x Volume

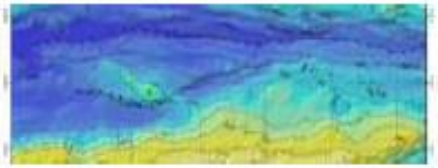


Pervasiveness - expansion to fill available storage through multiple working versions, scenarios and probabilistic realizations

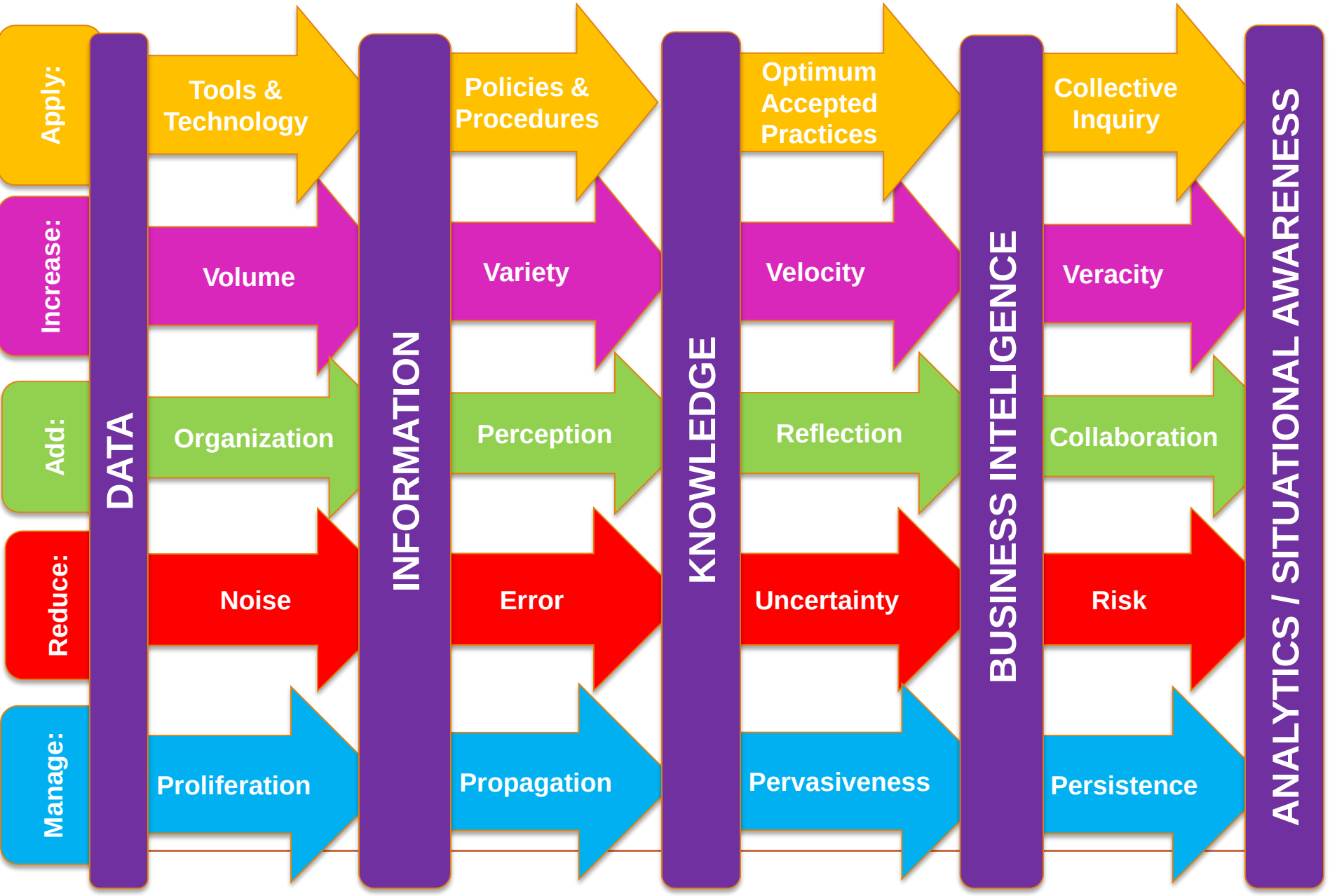
Variety x Velocity

Persistence – value over decadal and generational life spans

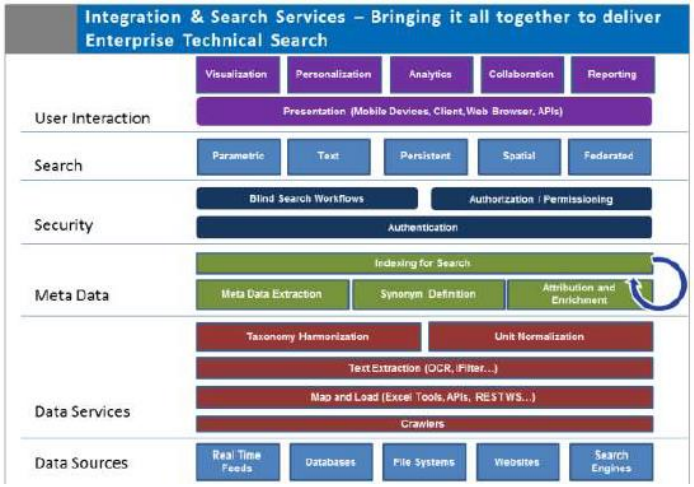
Variety x Velocity x Volume

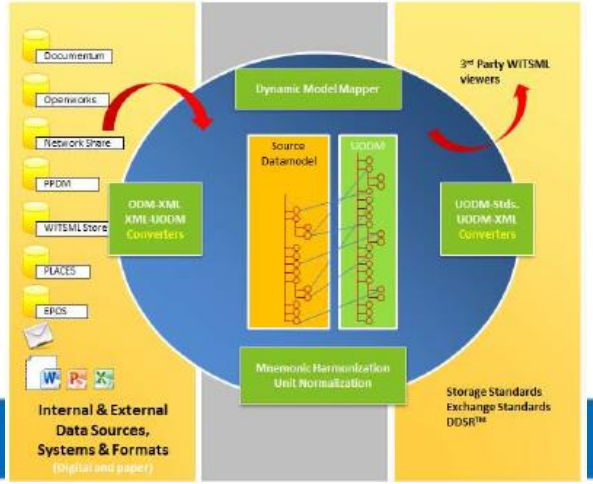


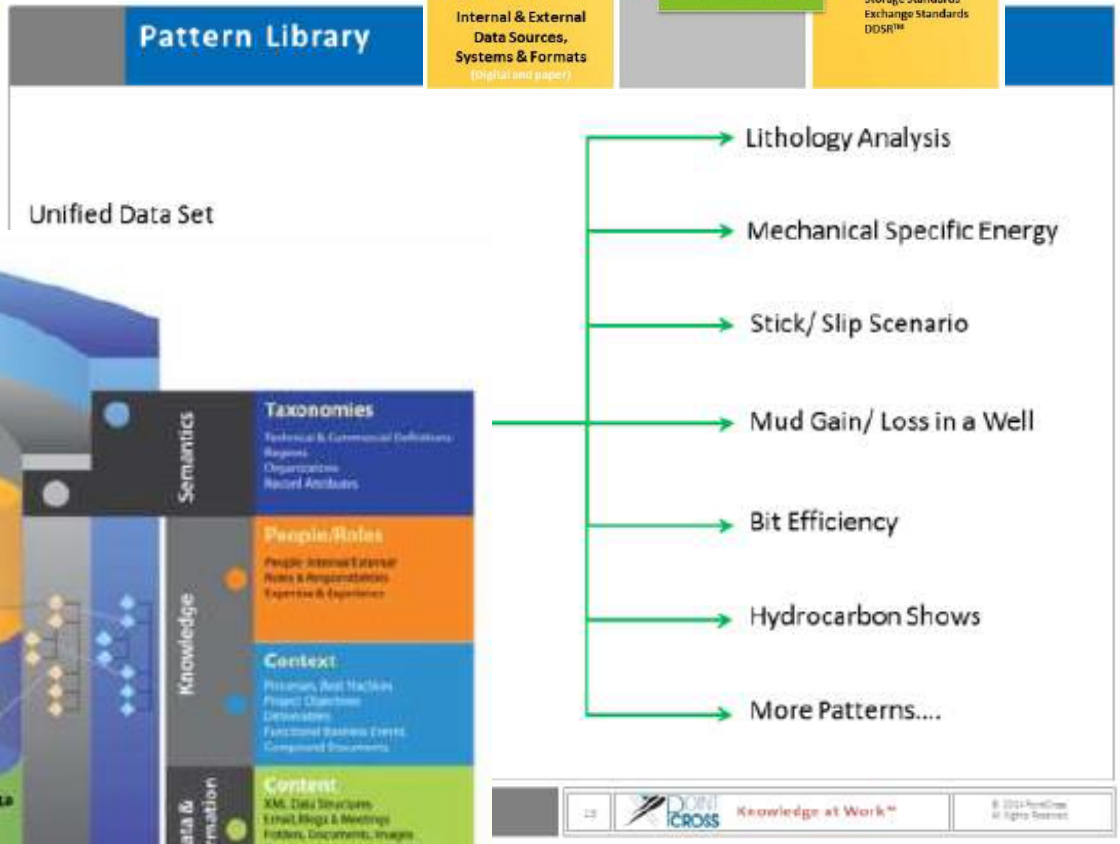
Maturity of Data Management in Oil & Gas



Managing Proliferation

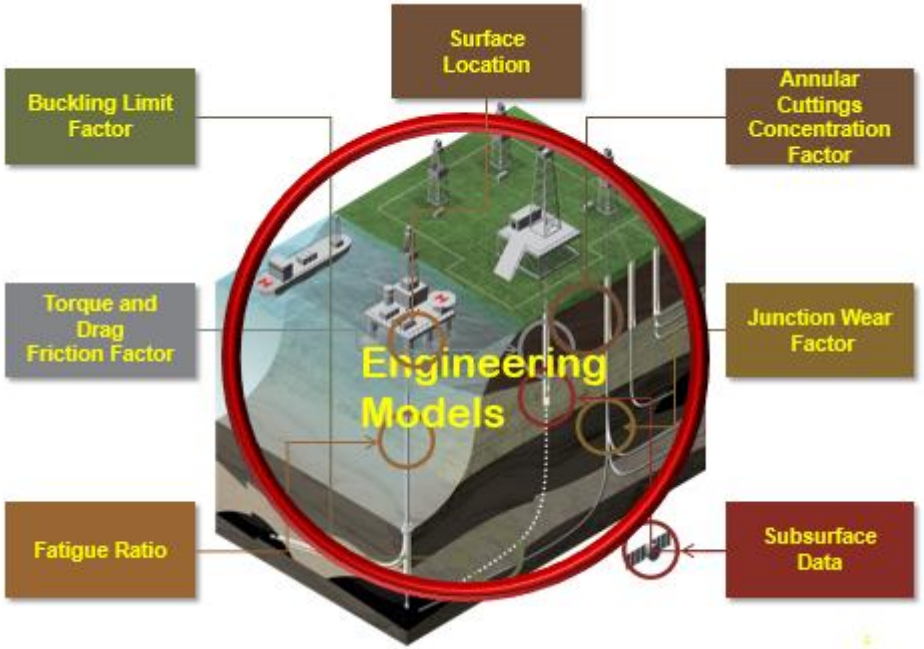


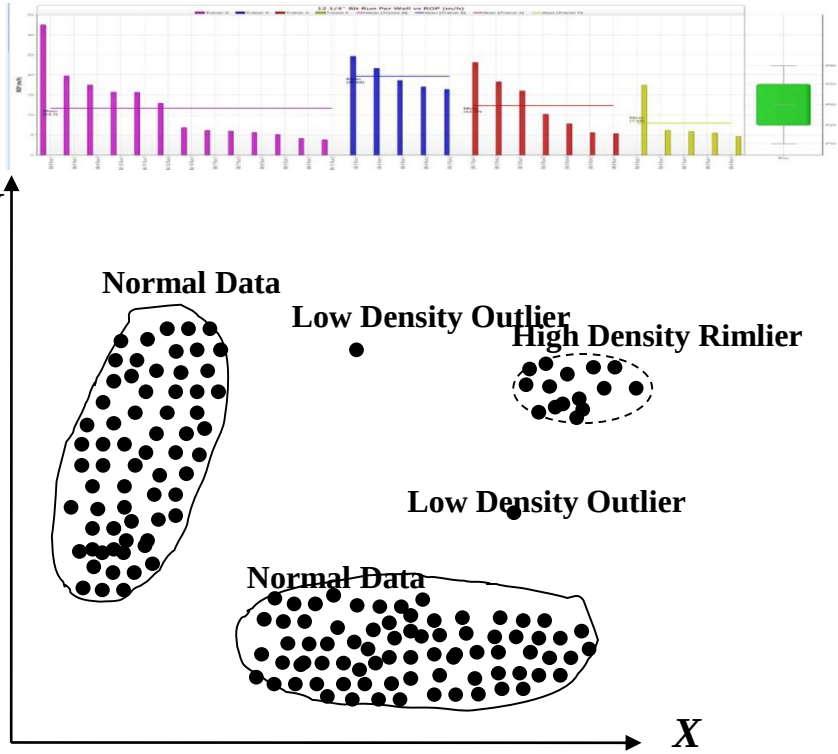


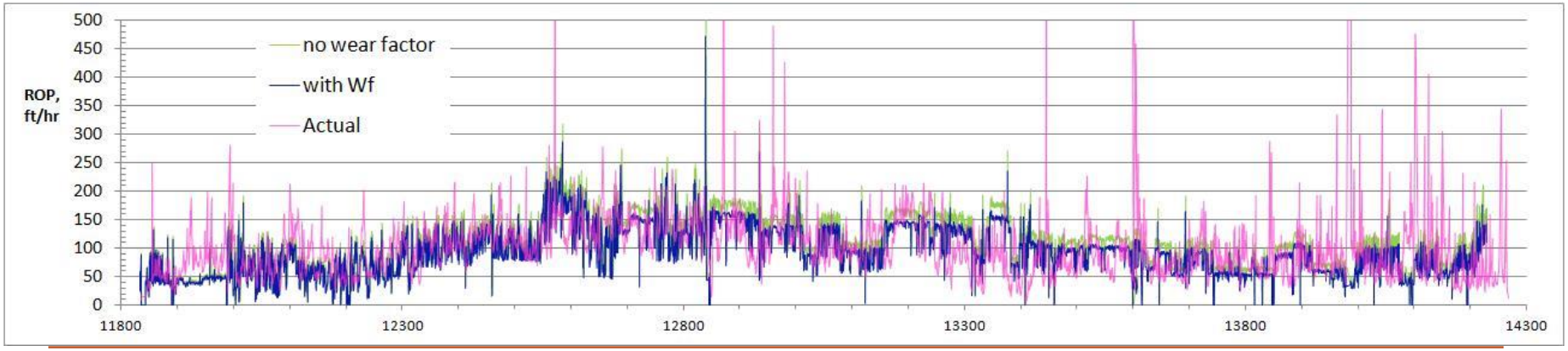


Source: PointCross, “Case Study: Drilling Data Server and Repository”, OilIT Online Magazine, October 2014.

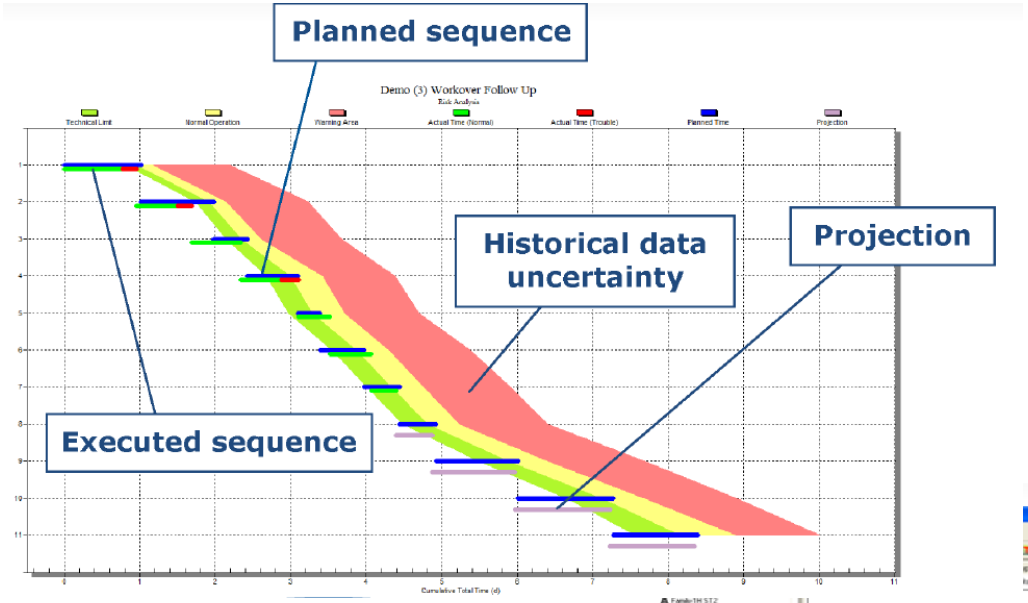
Managing Propagation

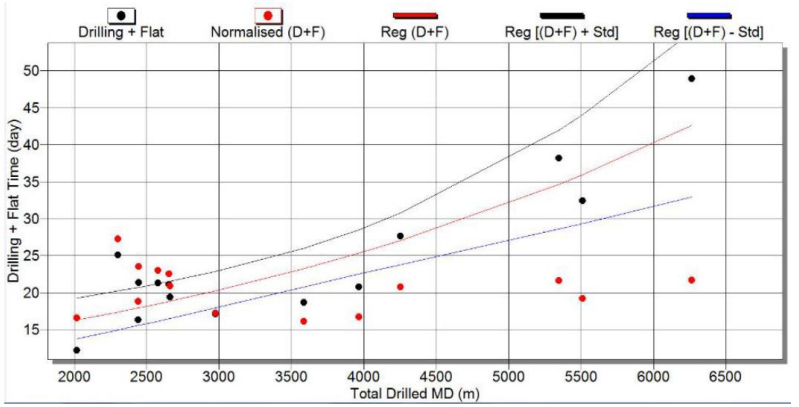


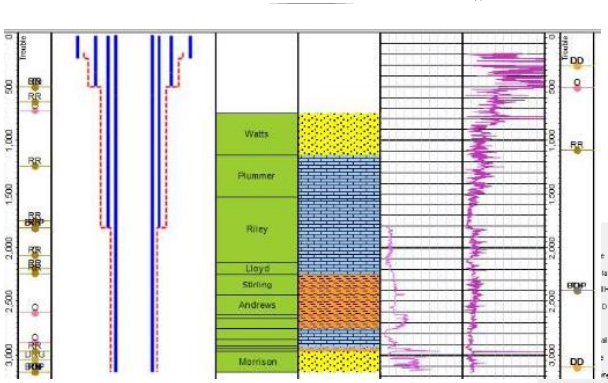


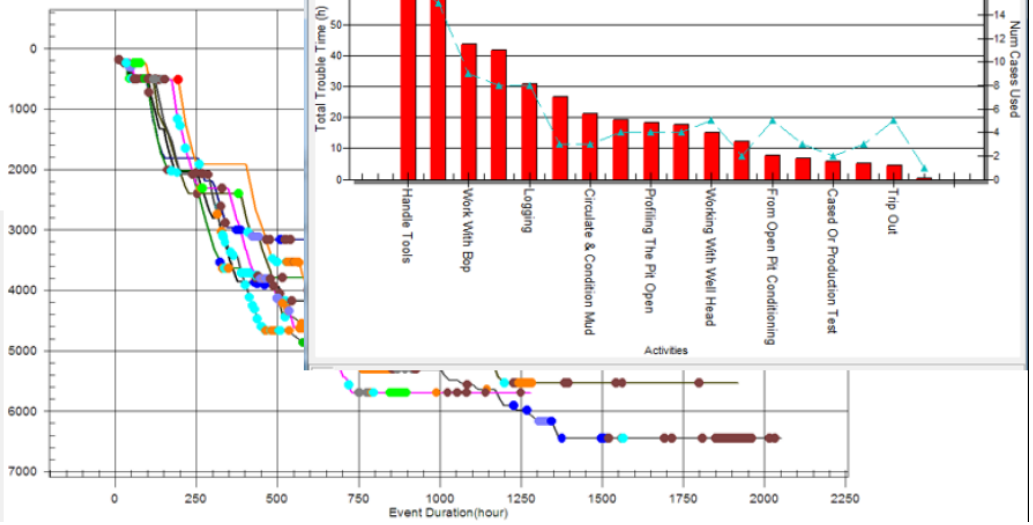


Managing Pervasiveness





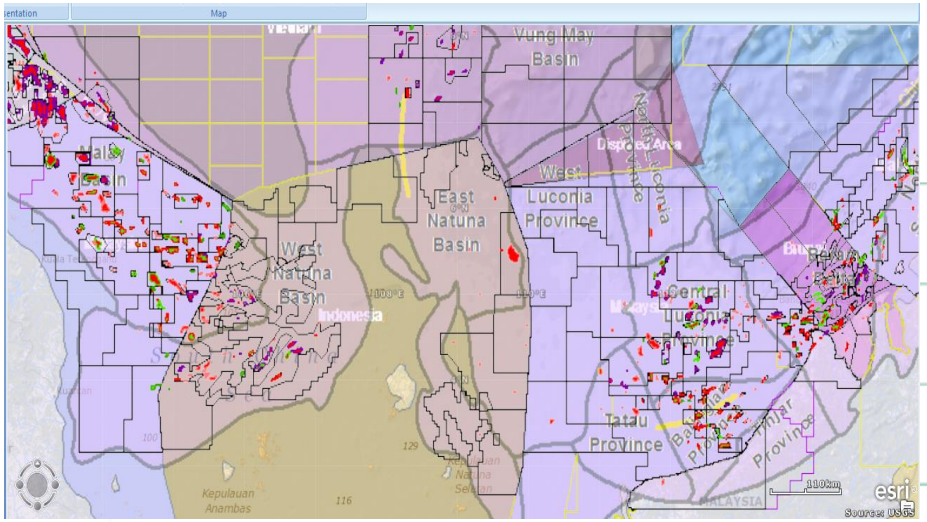




By applying this tool, significant cost savings to the tune of CAD$7.3 mln have been achieved as at the time of preparing this paper.

Source: Genesis Petroleum, “Data Management to Improve Drilling Operations”, UNI Strategic Next Genertation Digital OilFields Conference, Kuala Lumpur, November 2014

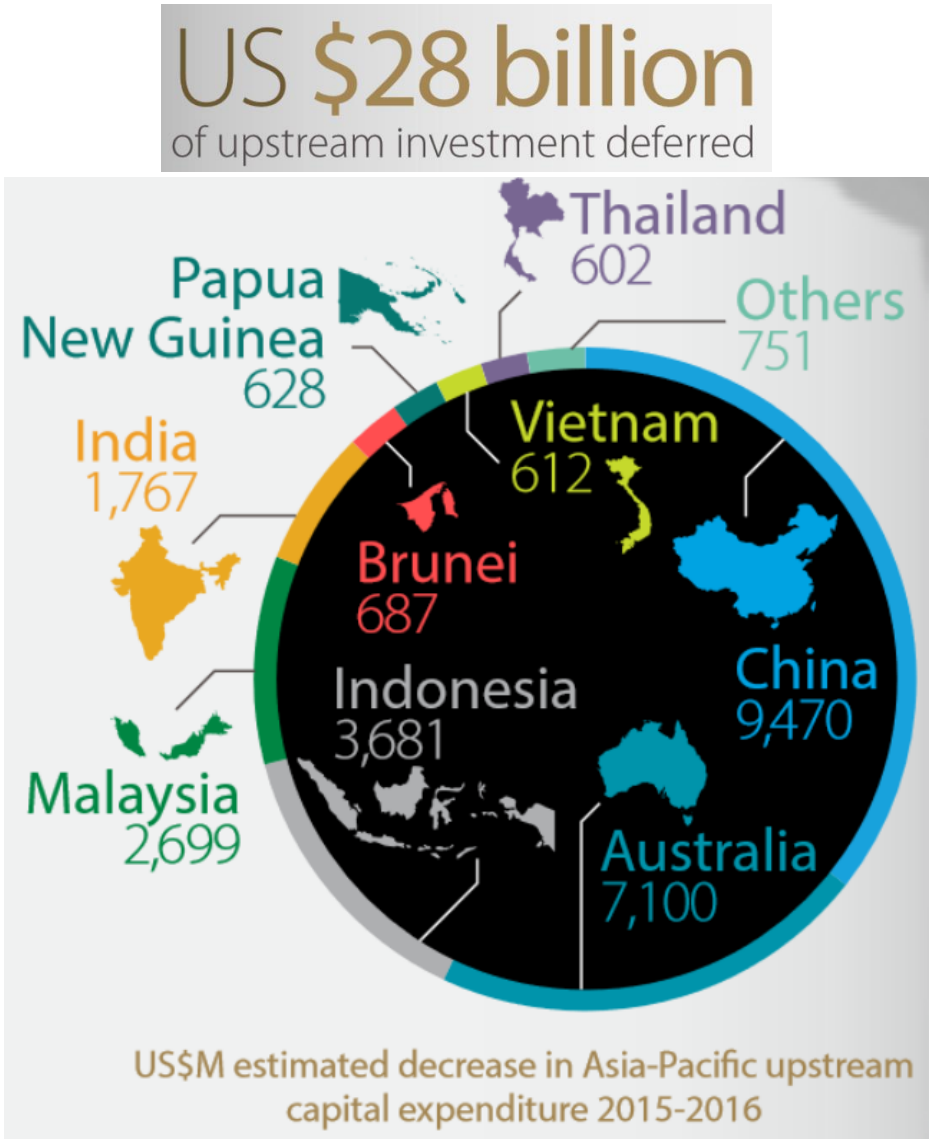
Managing Persistence

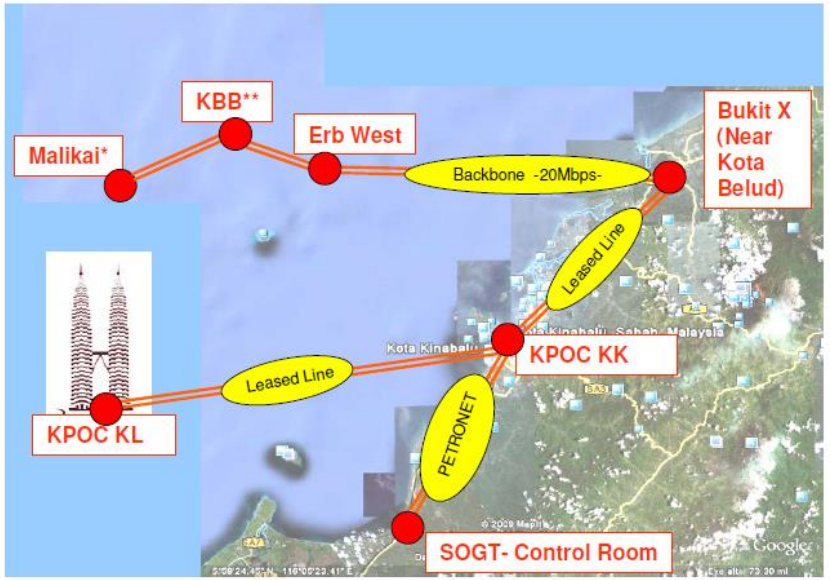


Creation date of legacy drilling reports in master data store

Refer to: Legacy Systems: “Transitioning From Legacy Systems To Future-Proofed IT Platforms”
Awad El Sidiq, Senior Database Administrator, ADNOC Distribution

Prioritizing in a Downturn



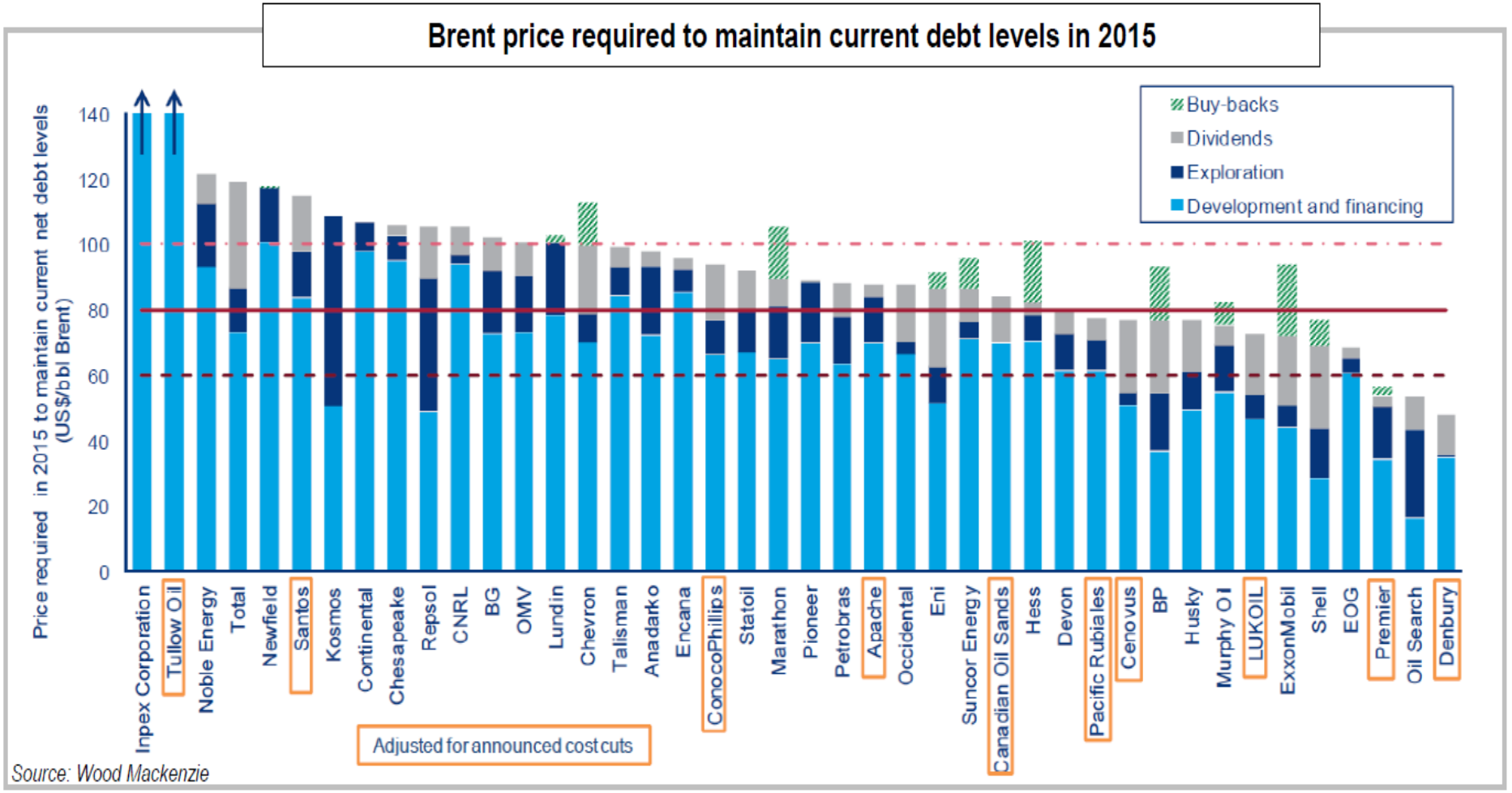


32% Reduction in POB costs for reactive maintenance with integrated drilling operations centers.

Source:
https://www.posccaesar.org/.../20101021_Ahmad_Zailan_Zakaria.pdf

Source:http://public.woodmac.com/content/portal/energy/highlights/wk1_Apr_15/Infographic-Oil-Price-Implications-Asia.pdf

Drilling Data in a Downturn



Source: "The Structural Change in the Oil and Gas Industry", Oil Search Limited, ARBN 055 079 868, UBS Superannuation Conference, Melbourne, " What's Next for Australia?",5th March 2015

Case Study – North Sea

Statoil:

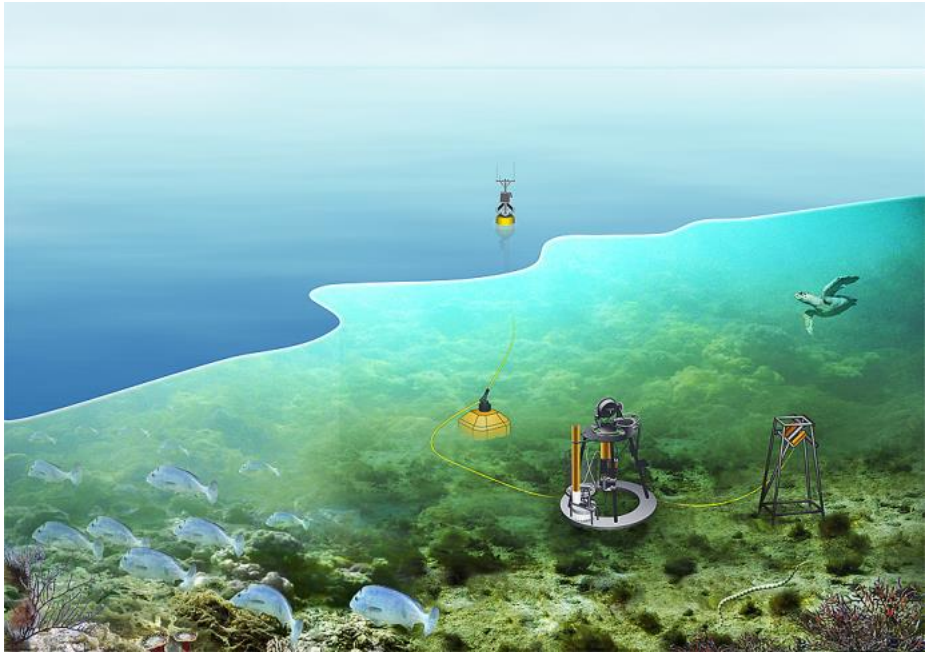
3- year project with risk management

Minimise the environmental impact of drilling and exploration.

Real-time physical, biological and chemical data
Sensors and cameras installed around offshore drilling facilities

Predict, detect and respond to operational issues causing environmental problems.

Contribute to winning consent from regulatory authorities for proposed new drilling operations.



"Those oil companies that are the first to take these kinds of measure into operations will be those that get the best acreage, for instance, in the ***Arctic waters***."

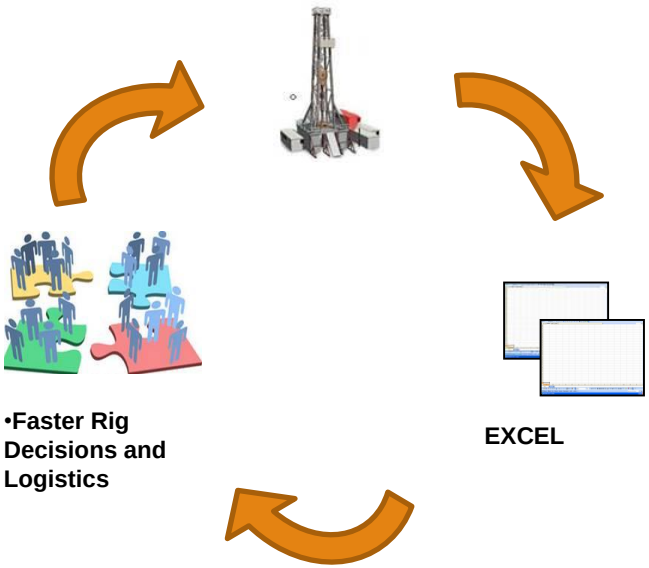
- Vidar Hepsø, principal researcher and project manager

Source: http://innovateblog.statoil.com/2012/02/01/real-time-environmental-monitoring-a-new-paradigm/

Case Study – South America

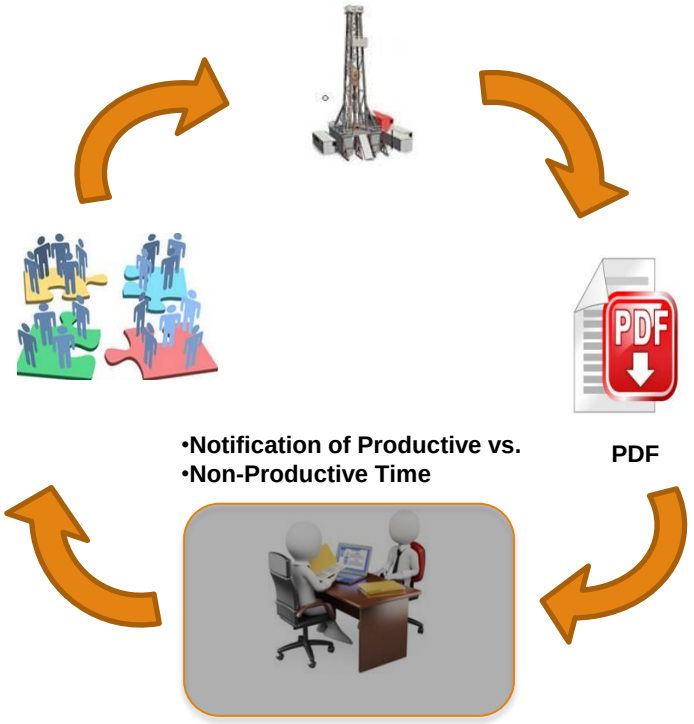
One District
50 Land Rigs
6 months performance

38 RIGS



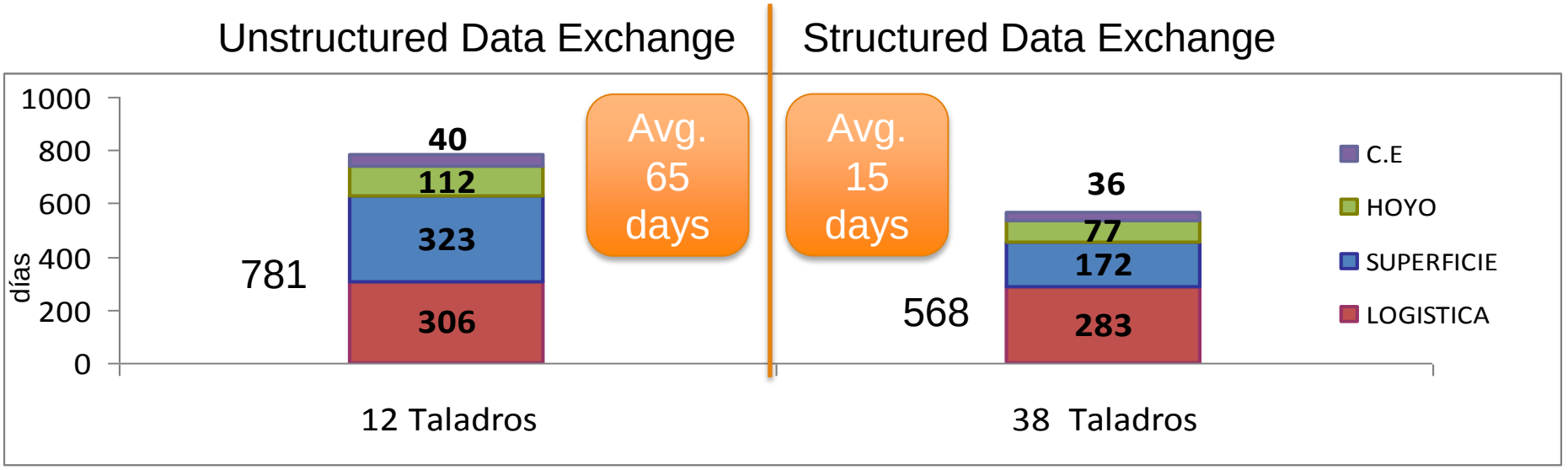
Structured Data Exchange

12 RIGS



Unstructured Data Exchange

Case Study – South America



Non-Productive Time Categories

Logístics	Surface	Well	External
Materials Request		Lost Circulation	Cash Flow
Transport	Equipment Failure	Stuck Pipe / Fishing	Environment
Personnel	Rigging Up	Completion	Manpower
Chemical Treatment	Power	Deviation	
Mobilization	Circulatión	Directional	
Hydraulics	Rotatión	Equipment Failure	
Cementing	Monitoring	Circulation	
	Security		

Case Study – South America

Quick Win Solution ROI

Return on Investment

Cost per Hour

(National Component) USD $780

(External Component) USD $840

NPT (Días)	MM$
781	16
180	4

ROI
(Return on Investment for converting 12 rigs to structured data exchange)

USD $23

Case Study – South America

Immediate Solution Proposal

Six Month Data Management Plan

1. Investment in Personnel, Equipment and Software

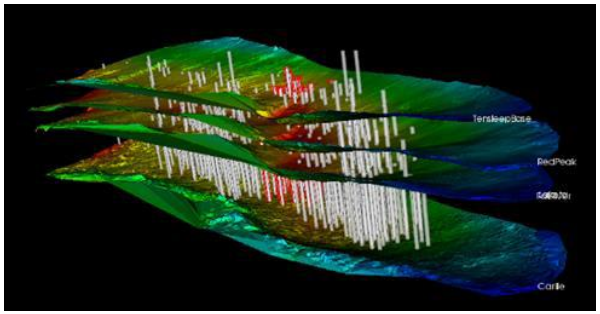
2. Follow up with Operations Personnel

3. Communication Plan

Elevator Speech: Those rigs and personnel can be used on projects with lower risk and higher drilling success rates.

What to Watch in Drilling Data:

1) Context from unstructured operations data

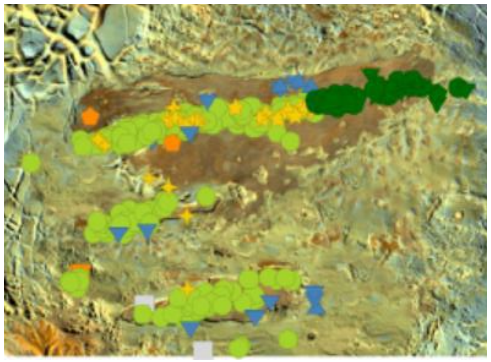


2) Connection with large third party datasets

3) Proactive management based on real-time trends

4) Insight from compliance checks and audits by regulators

5) Quantitative competitive intelligence



Adapted from: http://www.information-management.com/gallery/5-big-data-use-cases-10023102-1.html