



**Carbon Lifecycle
Technology
Consulting**



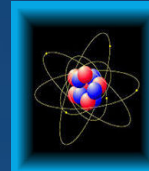
Energy IT Executive Meeting

Dallas, TX

July 2010

***Jess B. Kozman
Principal Consultant***

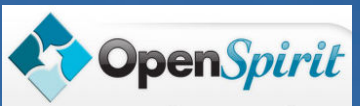
About CLTech



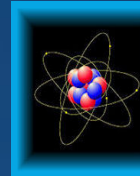
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- In operation since 1995
- Specializing in data management in oil and gas, carbon sequestration and mining sectors
- Full time and contract staff in Houston, Dallas, Calgary, Paris, Amsterdam and Perth
- Engagements and Alliances:



Data Management Drivers – Mid-Size U.S. Operators

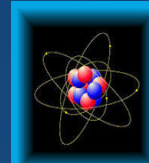


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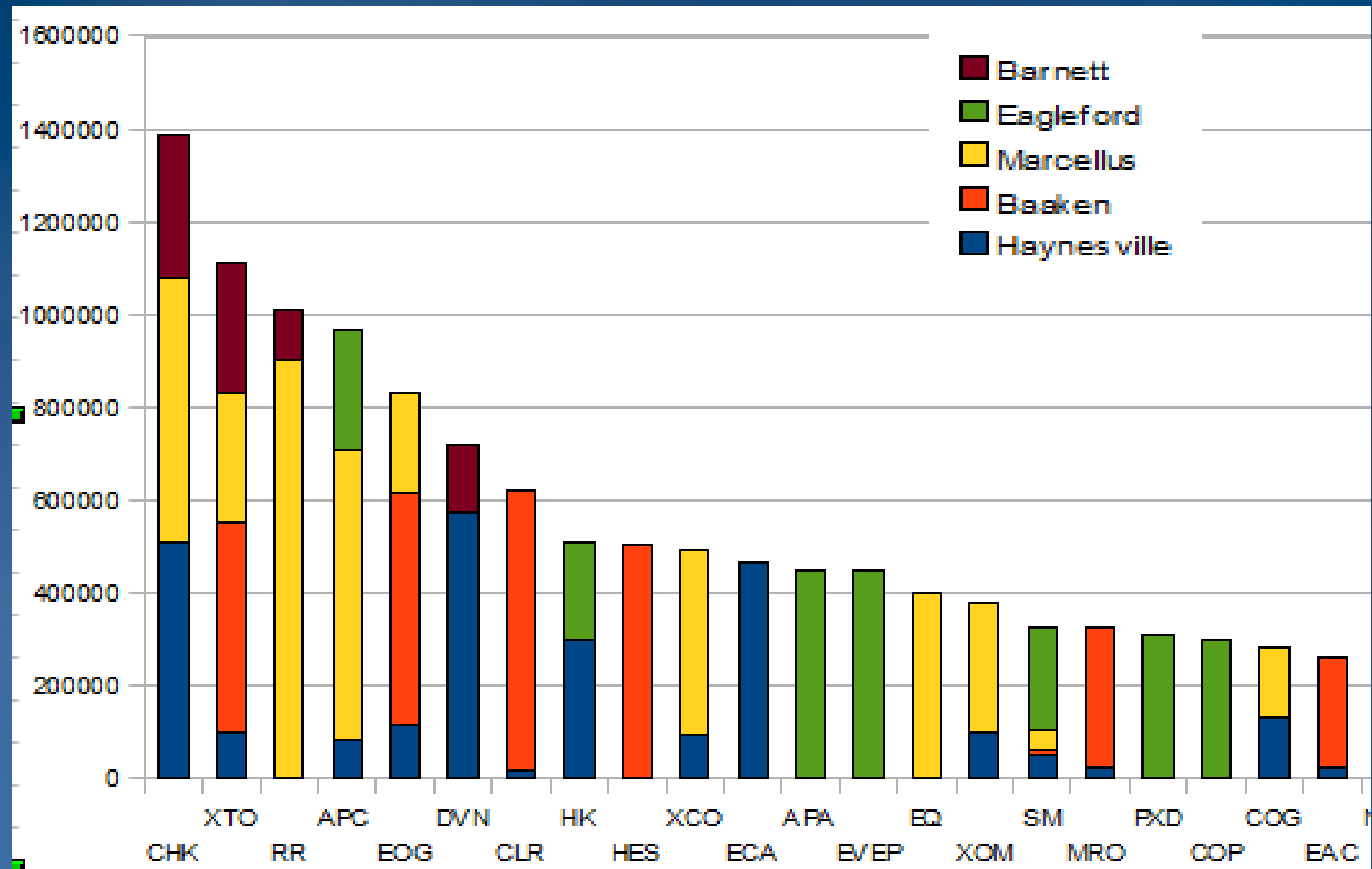


- 1) Growth through Mergers and Acquisitions***
- 2) Focus on Operational Expenditure***
- 3) Real-Time data from long reach horizontal wells***
- 4) Locations under-served by major software suppliers***
- 5) Lean data management staff***
- 6) New data types:
True Stratigraphic Position, Water Resources***

Shale Players



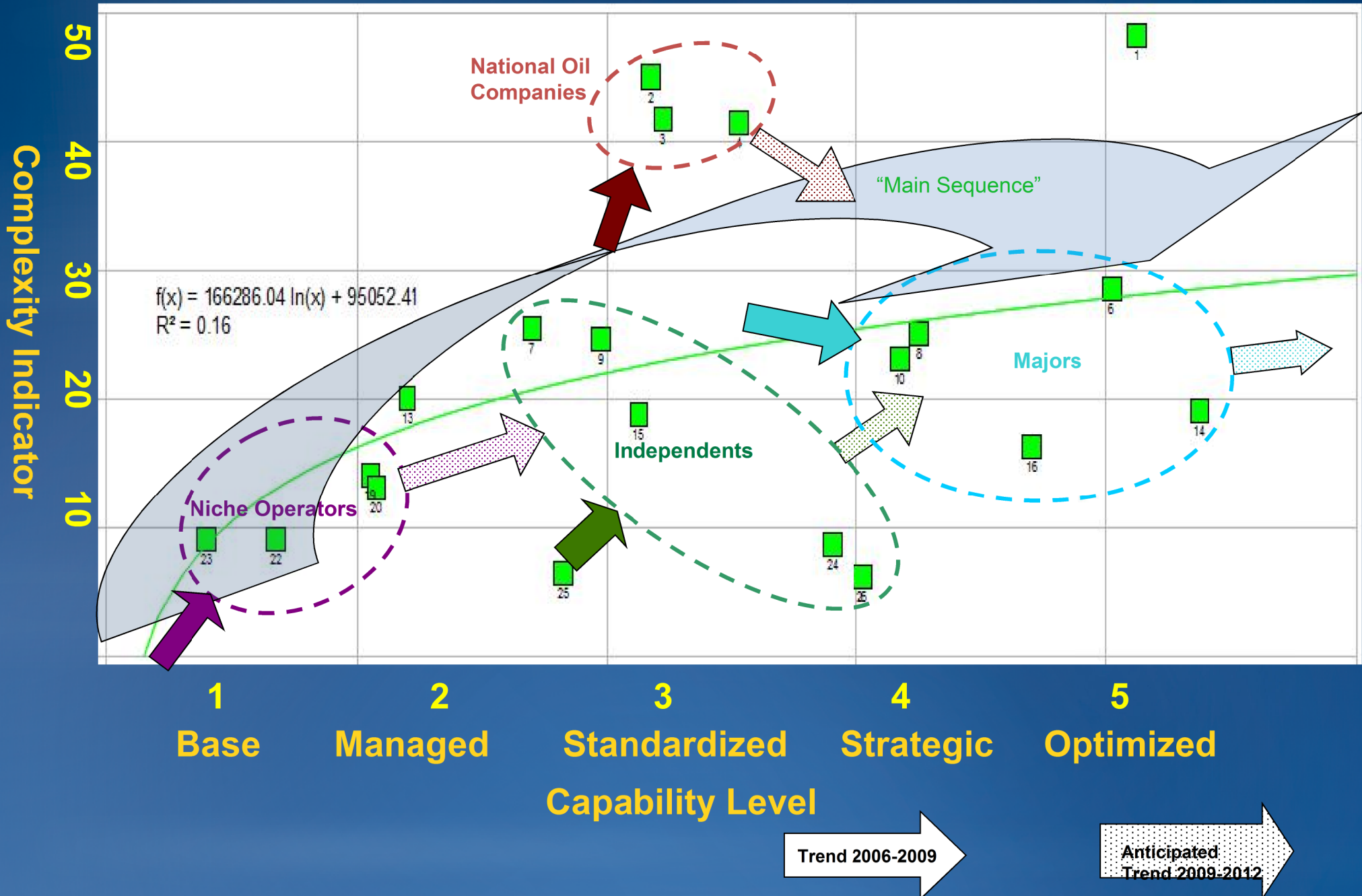
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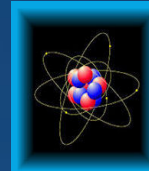
Industry IM trends on a Capability Maturity Model



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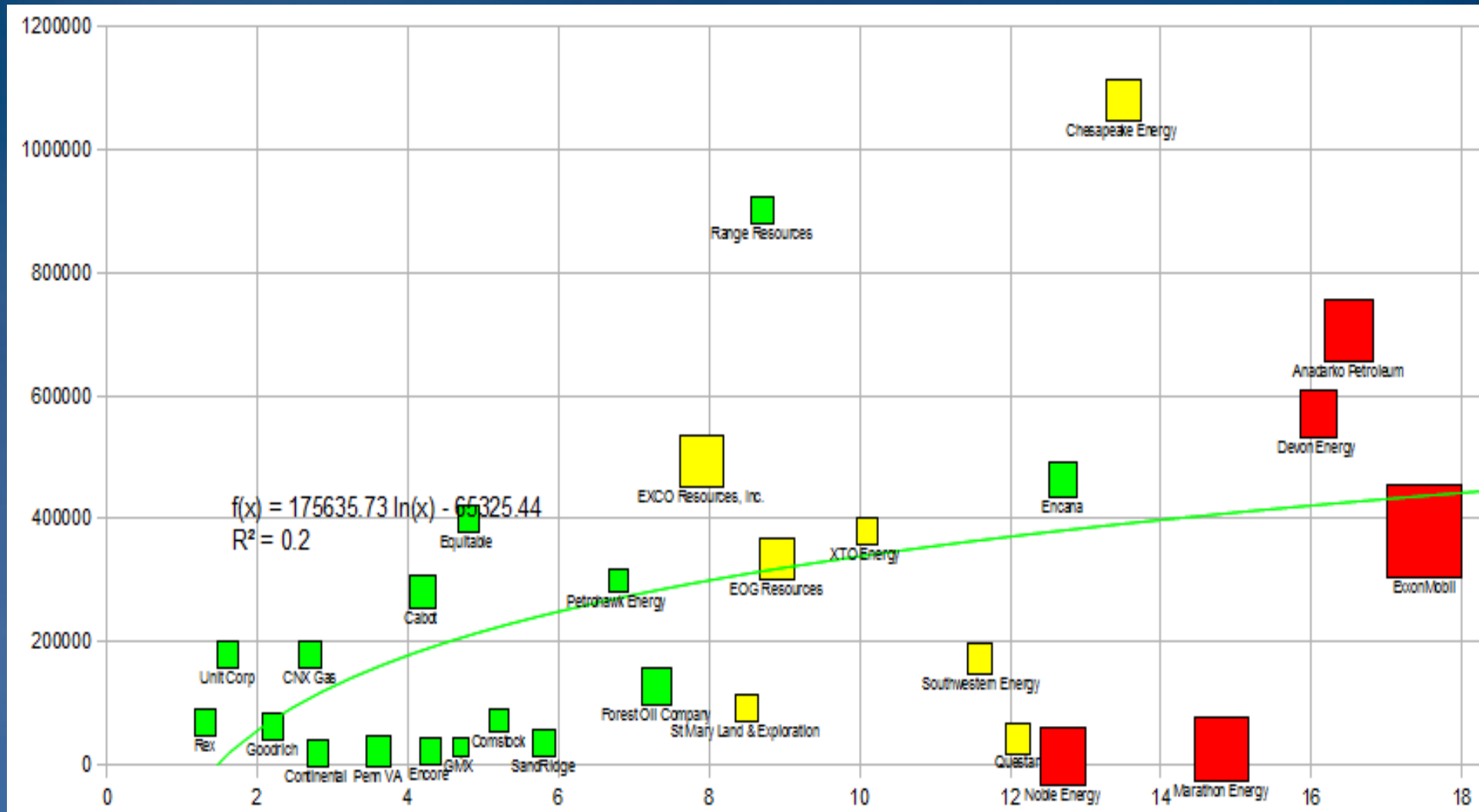
Opportunity to Improve Performance Through Data Management Initiatives



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Acrage Holding



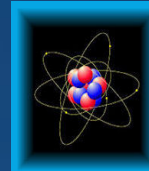
Data Management Complexity / Maturity



Data Management Challenges – Mid-Size U.S. Operators

- 1) Unstructured Data on Shared Drives***
- 2) Interoperability of Legacy Applications***
- 3) Nascent GIS Capabilities***
- 4) Rig-Centric Workflows***
- 5) Integration of Completions and Stratigraphic Information***

Unstructured Data Search: How do I find what should be there? And what do I do when I find what shouldn't?



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Location Search Saved Searches

shale Search

07/01/2010 07/11/2010 All Documents

Help

63% Driller Range Resources spokesman to fi

63% Yutes Run [99%]

... Resources spokesman to field questions about Marcellus shale 032200Z Jul 10 July 03--A Range ... plans for horizontal drilling in a Marcellus shale natural gas well along Yutes Run Road ... Cannon lead a lengthy discussion about Marcellus shale drilling. Cannon said the questions he often ...

7/3/2010 | 22:00:00 GMT extracted from "032200Z Jul 10"

[Map this document](#)
<http://c.moreover.com/click/he...54749361&z=950244896> (cac)

63% Plunger lift technology improves shale g

63% Fort Worth, Texas [99%]

... the guess work out of dewatering in shale gas wells. By David Cosby P.E. ... P.E., XTO Energy Inc. 439 1185 Shale gas is dramatically impacting reserves numbers in ... news. The bad news is that with shale gas wells, production can decline 70% or ...

7/8/2010 | 11:31:00 GMT extracted from "081131Z Jul 10"

[Map this document](#)
<http://c.moreover.com/click/he...85643096&z=950244896> (cac)

446 documents. Page 1 of over 50 >>

Petrohawk Energy Corporation has signed ... agreement to purchase strategic assets in the Fayetteville Shale for \$343 million in cash from ...

63% Van Buren [87%]

61% Conway [86%]

12/31/2007 extrac

86% confidence that "Conway" represents this place.

MetaCarta Delivered By **Schlumberger**

67% Todays Trends: Gulf Coast to Dominate F

67% Gulf Coast [87%]

Todays Trends: Gulf Coast to Dominate Future Shale Gas Production 012008Z Jul 10 The Gulf Coast region will produce most of the shale gas in the U.S. in 2020 ... Haynesville, Cotton Valley, Bossier and Eagle Ford shale plays, will supply 1.5 Tcf of ...

65% Arkoma Basin [100%]

61% Cotton Valley [85%]

61% Fayetteville [87%]

7/1/2010 | 20:08:00 GMT extracted from "012008Z Jul 10"

[Map this document](#)
<http://c.moreover.com/click/he...49787294&z=950244896> (cac)

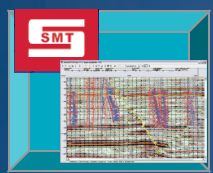
Driller Range Resources spokesman to field questions Ma... 99% Yutes Run

Scale in km 1:27683 k 41°10'35"N, 80°11'58"W

The Business Challenge: Legacy Systems

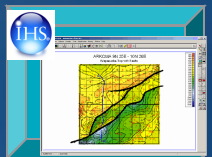


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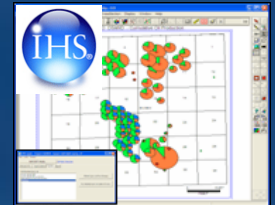


Kingdom

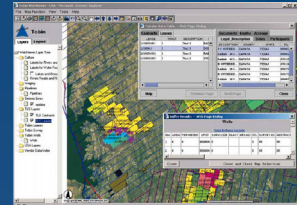
ascii file transfer



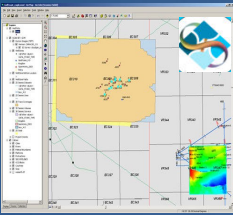
Petra



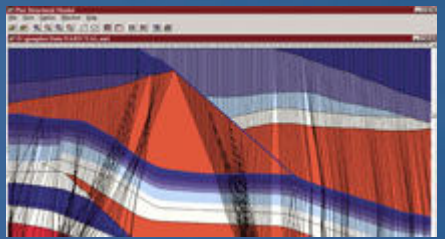
Enerdeq Browser



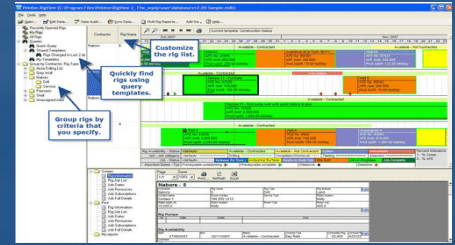
Tobin Web Viewer



OpenSpirit



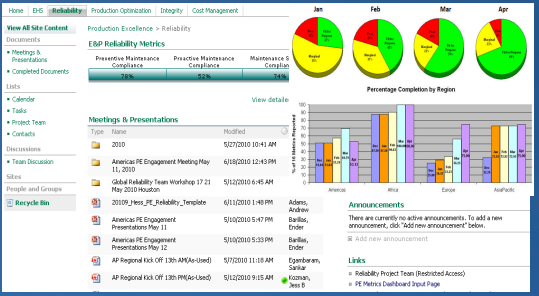
Geographix



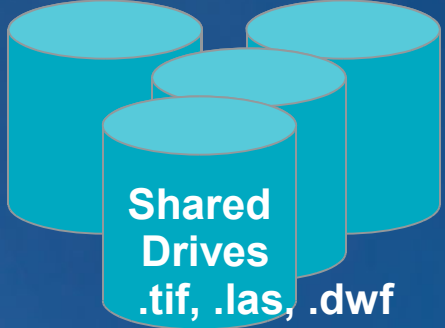
Peloton



ARC SDE 9.2



Sharepoint Portal



**Shared Drives
.tif, .las, .dwm**

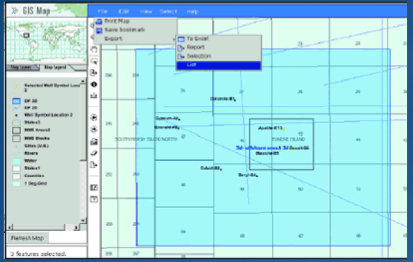
- Unintegrated point solutions
- Business processes not consistent across locations
- Only anecdotal understanding of value of data

= Maximum Level II (Managed) capabilities

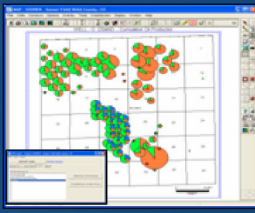
Quick Win Solutions:



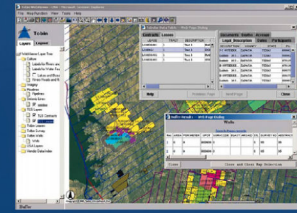
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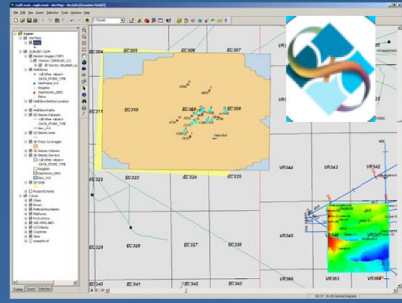
Enterprise Data Access



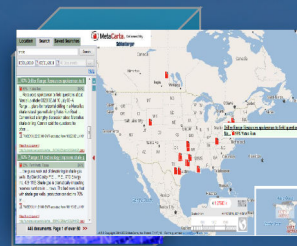
Browser



Web Viewer

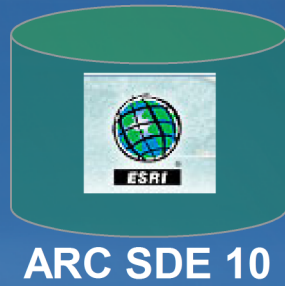


Middleware Data Connectors



Geo-Tagging

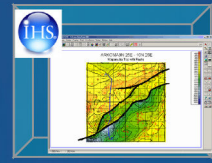
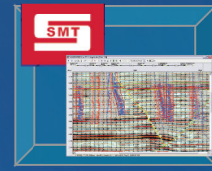
- Partnering with Technology Providers
 - Measuring Against Industry Standards
 - Leveraging Best Practices
- = Maximum Level III (Optimized) capabilities**



ARC SDE 10

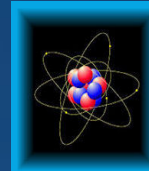


**Shared Drives
.tif, .las, .dwf**

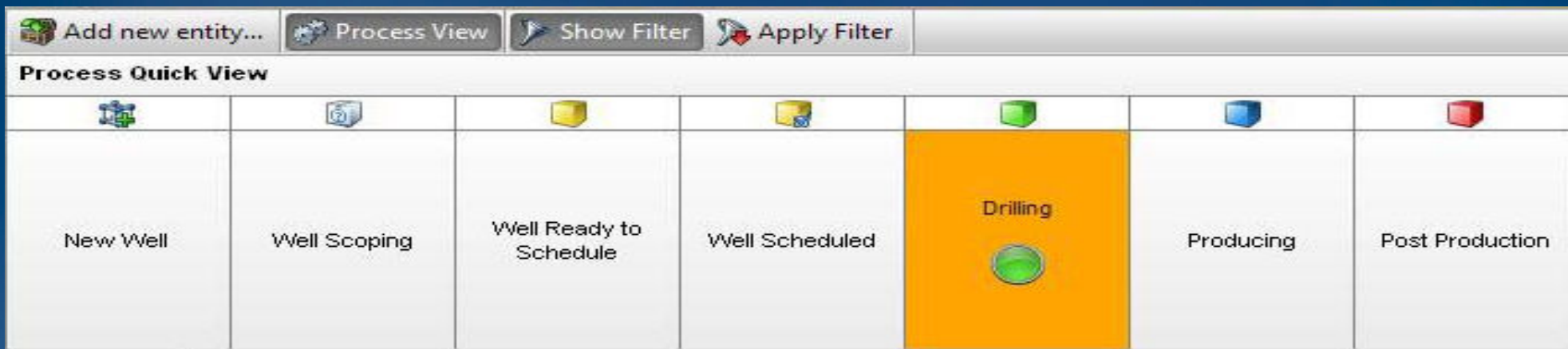


**Legacy Apps
(Kingdom / PETRA)**

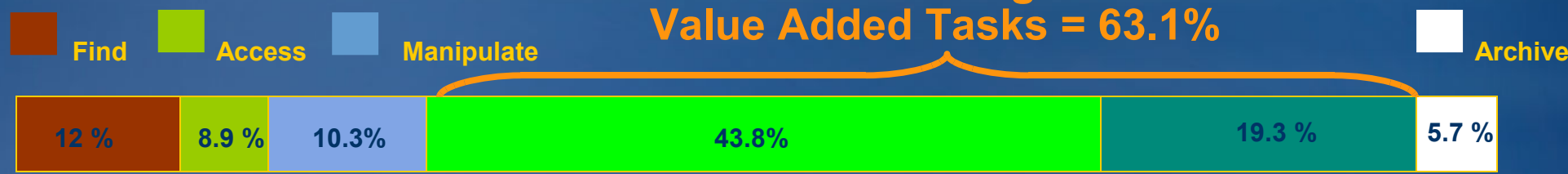
How embedding IM tasks improves efficiency – case studies



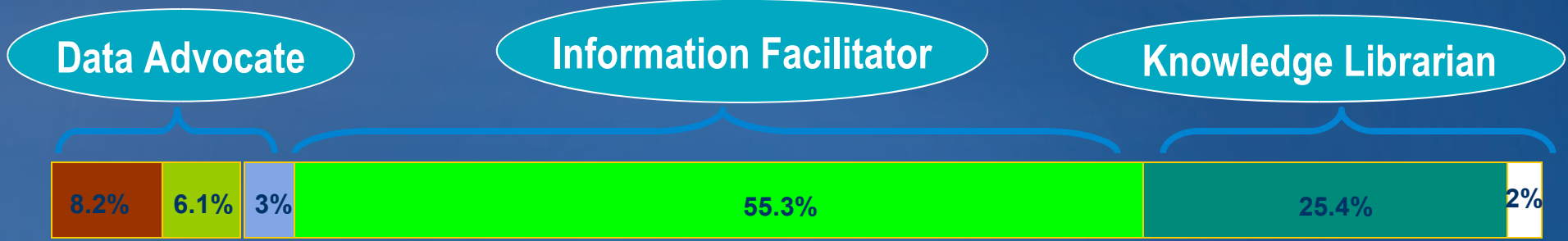
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**Before Embedding:
Value Added Tasks = 63.1%**



Embedded IM Roles:



**After Embedding: Value Added Tasks Increased to 80.7%
17.6% Improvement**

Rig-Centric Workflows:



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3GiG | Prospect Director

Module View Tools Help

My Explorer

- Home
- Navigation
- Refresh

Contents List
A list of contents within Bakken.

Add new entity... Process View Show Filter Apply Filter

Process Quick View

New Well	Well Scoping	Well Ready to Schedule	Well Scheduled	Drilling	Producing	Post Production
----------	--------------	------------------------	----------------	-----------------	-----------	-----------------

Entity Explorer (Asset)

- Bakken
 - Well Inventory Status
 - WI/NRI Status
 - Land Check List Status
 - Title Opinion Status
 - Ballot Status
 - Title Curative Status
 - Post Production Status
 - JOA Status
 - Land Administration Dashboard
 - Bakken General Documents (3)

Pending Decisions

Status Change	Decision	Action
On Schedule	Change: Behind Schedule to On Schedule	→
At Risk	Change: Behind Schedule to At Risk	→
Behind Schedule	Change: Behind Schedule to Behind Schedule	→
Return to Well Scoping	Change: Behind Schedule to Return to Well Scoping	→
Move to Well Scheduled	Change: Behind Schedule to Well Ready to Schedule Complete	→

Process Stage | Process Status

Process Stage	Process Status
Create New Well	New Well
Drilling	On Schedule
Drilling	On Schedule
Drilling	On Schedule
Drilling	On Schedule
Drilling	On Schedule
Drilling	On Schedule
Post Production	Post Production
Post Production	Producing Complete
Post Production	Post Production
Post Production	Post Production
Producing	On Schedule
Producing	On Schedule
Producing	On Schedule
Producing	On Schedule
Producing	On Schedule

48 items in 2 pages

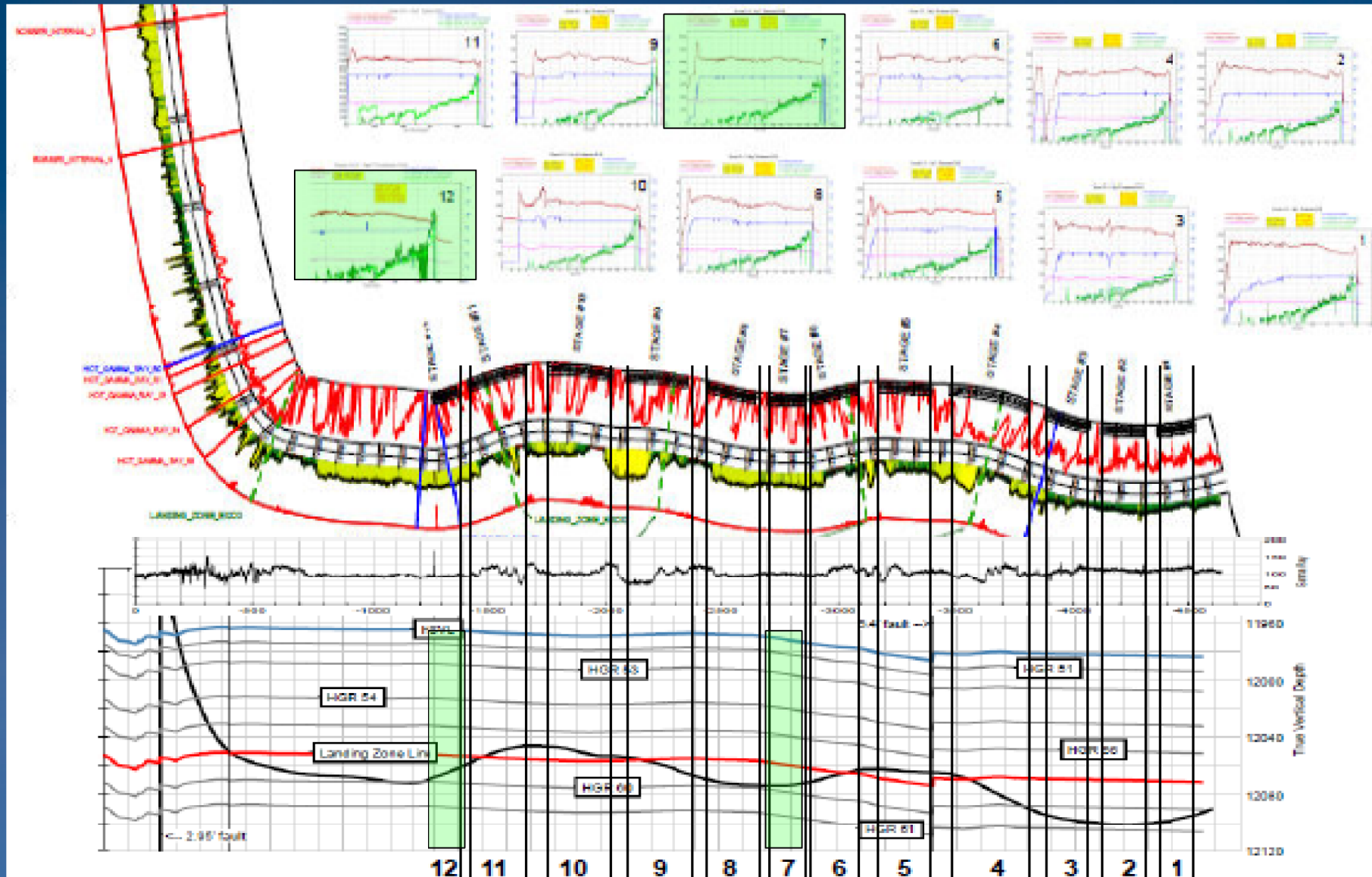
Done

Internet 100%

Cross-Domain Data Analytics - The Key to Improved Performance

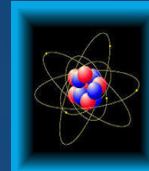


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An example of combining reservoir engineering data with geoscience domain data to better understand quantitative performance differences in horizontal frac jobs

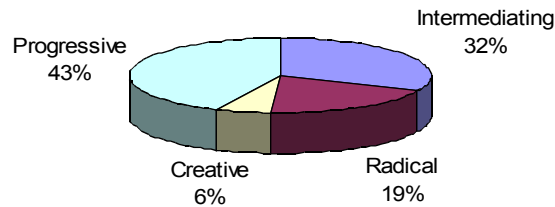
Technology Strategy Must Be Aligned with Change Trajectory



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Trajectory of Change Mix for All Industries



Oil and Gas Operators

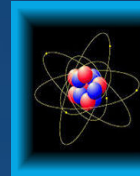
- Economies of scale matter
- Relationships matter
- Innovation is erratic
- Risk is mitigated using portfolio management
- *Creative Change can be easily confused with Radical Change*

Technology Partners

- Intellectual Property retains value
- Upstream & Downstream both threatened
- Threats often underestimated as long-term relationships are assumed to remain intact
- Pressures build slowly then hit all at once
- Future value will come from unconventional ways of extracting value from core assets, e.g. Software As A Service (SAAS)

Obsolescence of Core Activities

		Threatened	Not Threatened
Obsolescence of Core Assets	Threatened	Radical Change <i>Everything is up in the air</i> Examples: landline telephone equipment manufactures, overnight delivery services, and travel agencies	Creative Change <i>The industry is constantly redeveloping assets and resources</i> Examples: the motion picture Industry, investment banking
	Not Threatened	Intermediating Change <i>Relationships are fragile</i> Examples: automobile dealerships, investment brokerages, and auction houses	Progressive Change <i>Companies implement incremental testing and adapt to feedback</i> Examples: online auctions, airlines, long-haul trucking



Quick Wins and Best Practices - Where do I Start?

- 1) Data Discovery -
“You can't manage what you don't understand”*
- 2) Automate data transfer processes*
- 3) Standards and Naming Conventions*
- 4) Data ownership and embedded data technicians*
- 5) Make your data rig-centric for operations*
- 6) Leverage the new data types from horizontal wells*

Food for Thought:



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