



The Dbriefs Energy & Resources Series Presents:

Analyze This: Streamlining Production Operations Through Better Visualization

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- Defining Analytics and it's Value
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 - Land
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Polling Question #1

Please select the category below that best describes your business:

- a. Upstream
- b. Midstream
- c. Downstream
- d. Field Service
- e. Support Service
- f. Other

Setting the Context

The Oil and Gas industry has unique operational goals that must be attained to ensure success

Quickly adapt capital spending and operational plans to changing prices

Manage drilling programs to market demands

Respond to increasing competition

Optimize operational planning to align with lease holdings

Increase exploration success

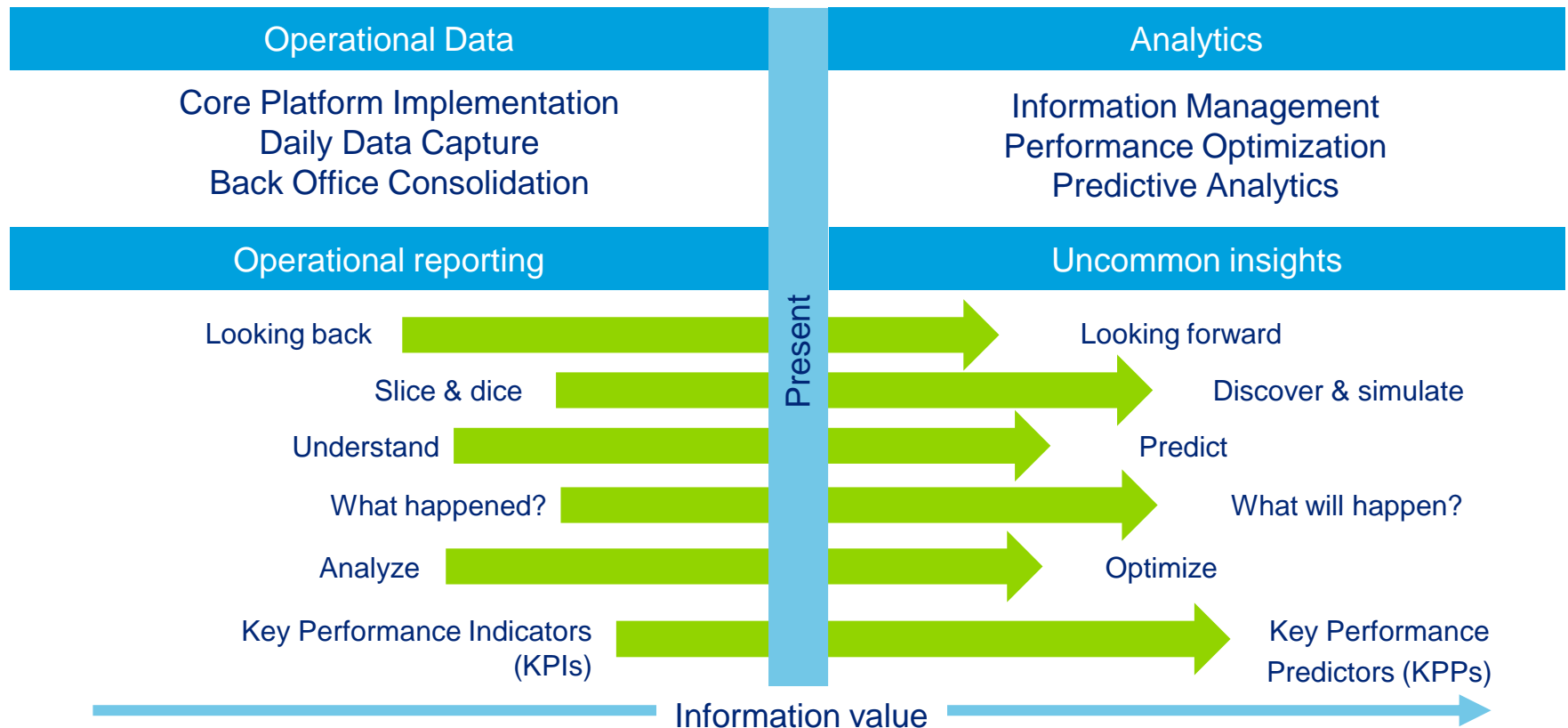
Ultimately, where will our competitive advantage originate?

Given the current realities in Oil & Gas

- Need to answer tough, "crunchy" questions:
 - How much can adjustments in one or more of the areas affect us?
 - Which course of action is the most worthwhile?
 - Are we optimizing our assets?
 - Are we getting the advantage we expected?

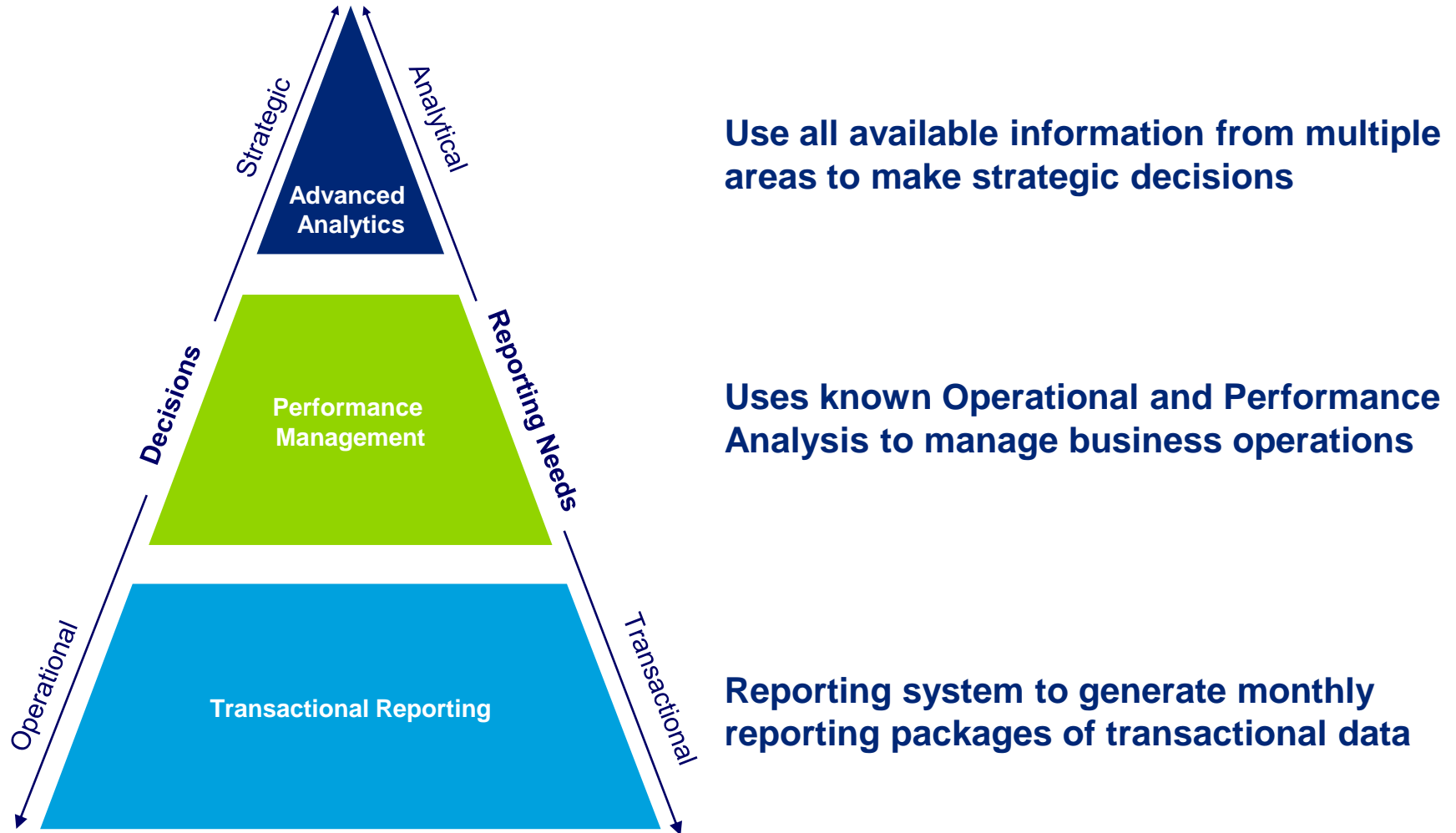
Moving to Fact-Based Decision Making

A pivot in business focus is occurring in the market, from process efficiency, to analyzing information to improve performance

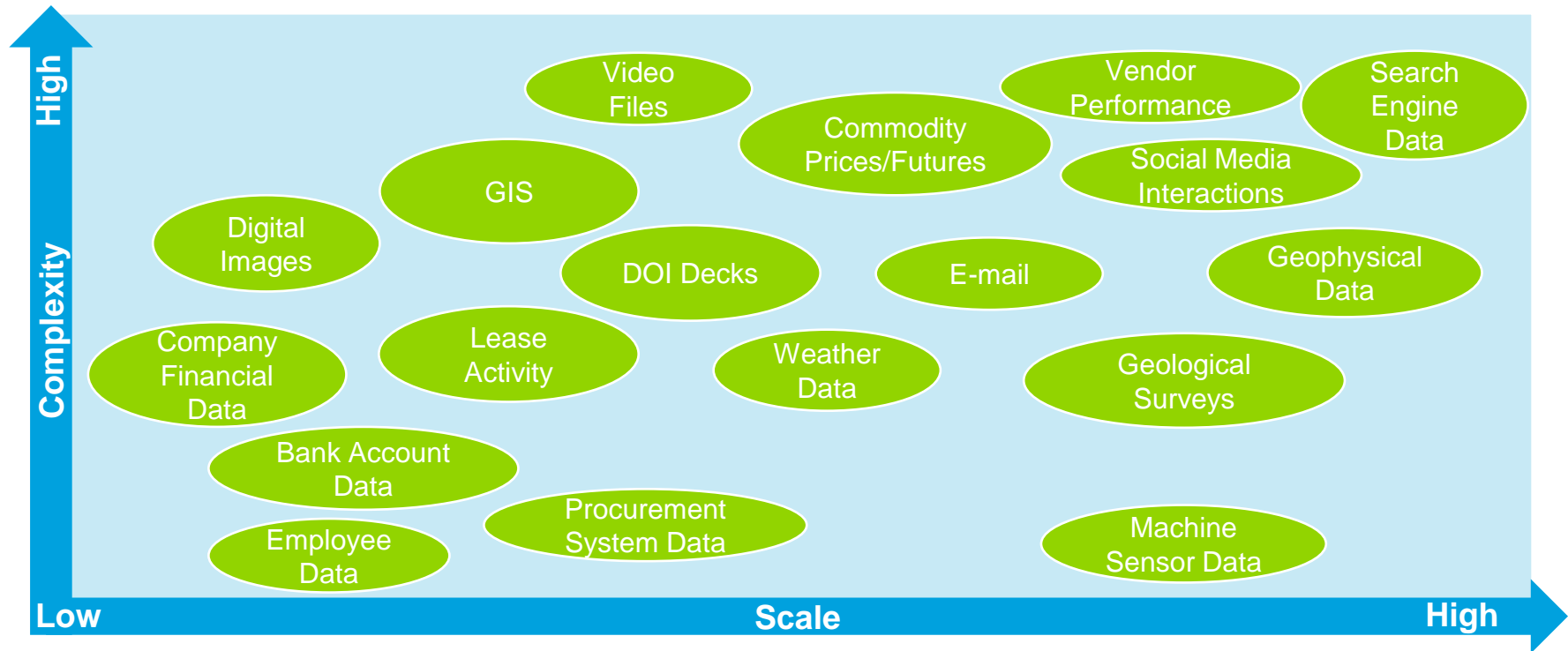


Types of Reporting & Analytics

Through analytics, companies can obtain fact-based information that they need to make informed decisions



Big Data — Next Level Analytics



Big Data and Oil & Gas

- Integration of G&G, visualization and analytics to enhance field production
- Identification of drilling trends using external survey, weather, climate data
- Increased profitability through analytical analysis of leases, production data and supply chain

Mobile Analytics — Making Analytics Available

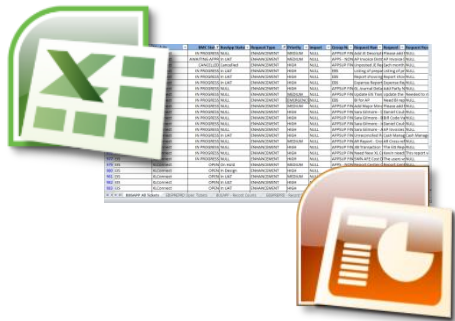
Mobile Analytics is about providing information to operations users and executives when they need it, creating the true analytical enterprise

Provide Information to those executing business operations in the field

Low
Maturity

Leading
Edge

Mobile Analytical Tools



Spreadsheets



Email Alerts



Interactive Dashboards

Polling Question #2

Where do you see greatest benefits for applying Analytics to your operations?

- a. Finance
- b. Land Lease Holds
- c. Drilling & Completions
- d. Production Optimization
- e. Supply Chain
- f. Other

Optimizing Land Performance

Optimizing Land Performance through Analytics

Challenge

- Lease obligations must be met to retain acreage positions
- Drilling schedules should be optimized per acreage expiration in combination with data from other functions
- Visibility is needed into effectiveness of Land organization
- Well lifecycle events (shut-ins, payouts, etc.) require coordination and action across Land and other back office functions which have traditionally been treated as separate silos

Analytics Opportunity

- Improve lease obligation compliance
- More effectively retain leasehold acreage via smart drilling schedules
- Identify acreage targets, trends and totals by prospect/location
- Provide organizational visibility into company interests
- Identify and measure KPIs to assess Land function
- Dashboards to provide exception reporting to manage business events

What can be done today?

Visibility into Land data can trigger action across functions

KPI Scorecards

Scorecards can be used to measure efficiency of the Land function

- Cycle time for DOI setup
- DOI errors and downstream PPAs
- Lease obligations satisfied

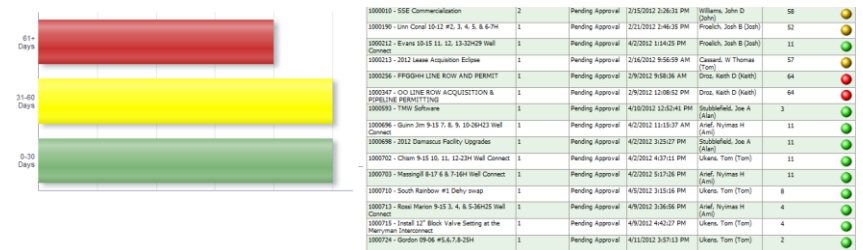


Lease and Acreage KPIs

Event Notifications

Dashboards can be used to notify personnel of key business events that require action:

- Well lifecycle events (first sales, shut-ins, P&A)
- Well payouts per JOA consent penalties
- PPAs to be processed based on ownership corrections



Event Activity Summary and Details

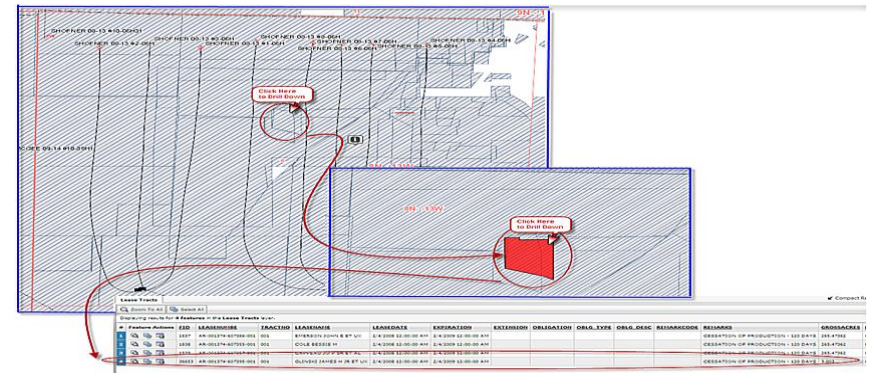
Taking it to the Next Level

Integrate other organization data with Land data to optimize planning and forecasting

GIS Multi-Functional Views

Where are our most profitable wells in relation to unproducing acreage?

- Data from Land, Finance and Production functions can be integrated and displayed in graphical views to better visualize trends and opportunities



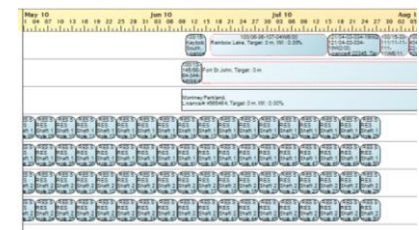
GIS Drill-Down to Land Data

- Lease Expiration
- Commodity Prices
- Rig Location
- Well Location
- # Rigs Available

**Sample
Data Inputs**

**Analytical
Optimization**

**Prioritized
Schedule**



Optimizing Drilling and Completions Processes

Optimizing D&C Performance through Analytics

Operators are analyzing D&C operational factors on well economics

Challenges/Goals

- Low price of natural gas has lead to increased emphasis on cost reduction
- Need to increase the decision making ability of operators to drive cost reduction and operational improvement strategies through the analysis of historic/real-time drilling and completions data, including external benchmarking
- Drilling & Completions data stored in numerous siloed systems has tangible business value when it can be related

Opportunity for Analytics

- Identify cost and operational trends
- Normalize data by decoupling cost and operational variations
- Improve overall cost and operational forecasts
- Mine historical data and create predictive models explaining actionable insights by operator, region, well type, selected vendor, etc.
- Leverage related data sources to gain insights

What can be done today?

Comparative analysis and benchmarking between drillers

Cost Comparison

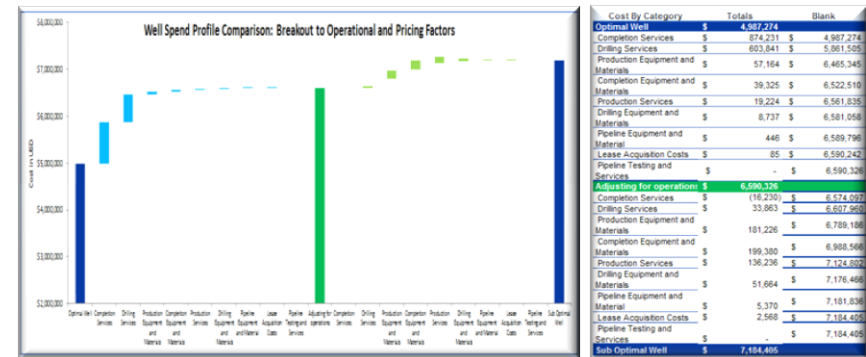
By highlighting the differences in typical well performance and costs an operator can focus on specific cost categories.

Deep Dive Analysis

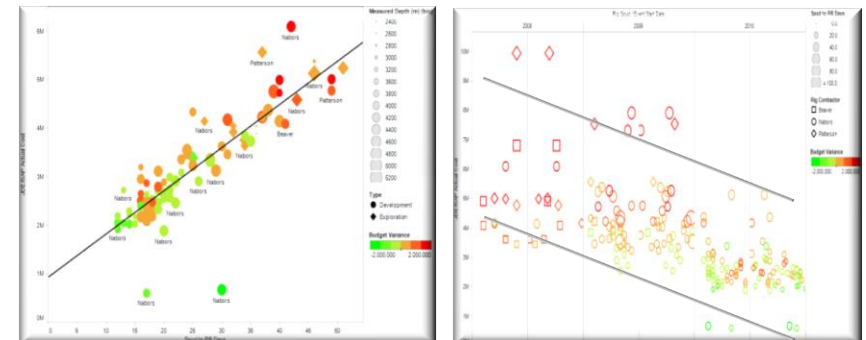
Identify a strategy to increase drilling productivity while reducing costs

What is driving the variation in cost, if it is not purely operational?

- Are vendors delivering services at the quoted prices?
- Are our operational methods cost competitive?
- Are my contracts tied to raw material fluctuations (mud, cement, casing, etc.)



Normalized cost data



Trend Analysis

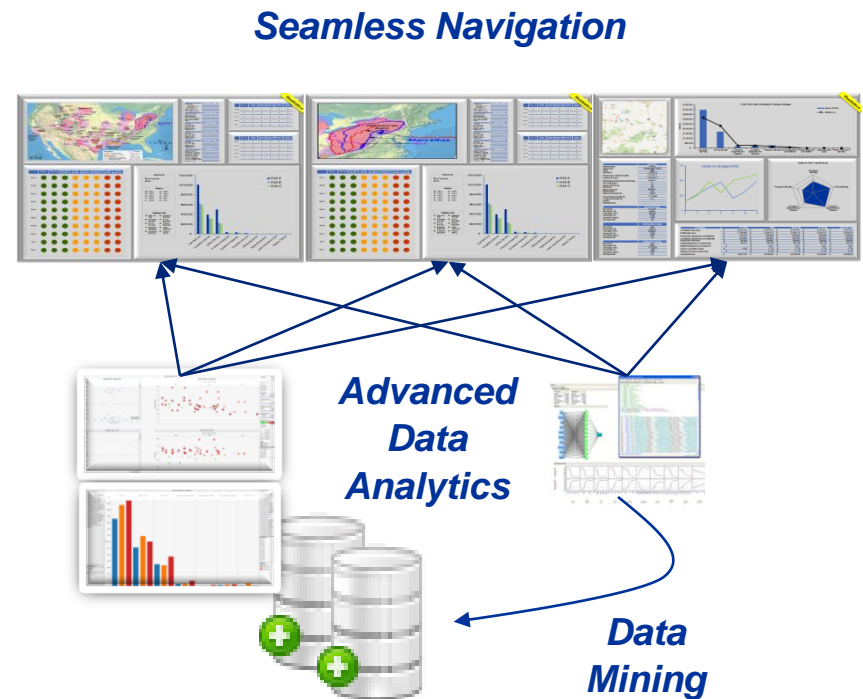
Taking it to the Next Level

Move beyond "show me the trends" to "help me find the trends"

Data Mining & Predictive Forecasting

Mine historic data and leverage data that is available in the industry to help operators perform rapid benchmarking and comparative analysis for forecasting and decision making

- Develop industry cost curves by category, region, well type etc.
- Track observed learning curves
- Understand how movements in raw material cost will affect overall economics
- Improved "What-if" scenario planning
- Improved vendor selection methodologies



Optimizing Production

Optimizing Production through Analytics

At the core of the analytical enterprise is using operational data to optimize production activities and identify significant future trends

Challenges/Goals

- Need to sift through volumes of data to identify an optimal approach for producing
- Multiple data sources lead to delay in decision making
- Data sets, formats and reporting capabilities make it difficult to analyze data and exceptions real time
- Inefficient production optimization decisions can lead to longer or multiple downtime events or quicker decline of reservoir performance

Opportunity for Analytics

- Improve data efficiency and accuracy to manage production and field development
- Identify production trends and predict assets performances (from initial construction through Drilling/Completion to actual Production)
- Create and manage a total view of a field as an integrated system: reservoir, wells, field technology, performance capabilities, and leading practices

What can be done today?

Trends from multiple data sources can enable decision making

Well Performance/Controls

Use existing data to plan and minimize non-productive downtime

- Accelerate production and reduce downtime through comprehensive analysis of well performance
- Collect real time data to perform exception based analysis



Well	Date	Yield Down	Today Down	Reason Code	Downtime Description
V100	04/25/08	0.0	0.0		
V101	04/25/08	0.0	0.0		
V102	04/25/08	0.0	0.0		
V103	04/25/08	0.0	0.0		
V104	04/25/08	0.0	0.0		
V105	04/25/08	0.0	0.0		
V106	04/25/08	0.0	0.0		
V107	04/25/08	0.0	0.0		
V108	04/25/08	0.0	0.0		
V109	04/25/08	0.0	0.0		
V110	04/25/08	0.0	0.0		
V111	04/25/08	0.0	0.0		
V112	04/25/08	0.0	0.0		
V113	04/25/08	0.0	0.0		
V114	04/25/08	0.0	0.0		
V115	04/25/08	0.0	0.0		
V116	04/25/08	0.0	0.0		
V117	04/25/08	0.0	0.0		
V118	04/25/08	0.0	0.0		
V119	04/25/08	0.0	0.0		
V120	04/25/08	0.0	0.0		

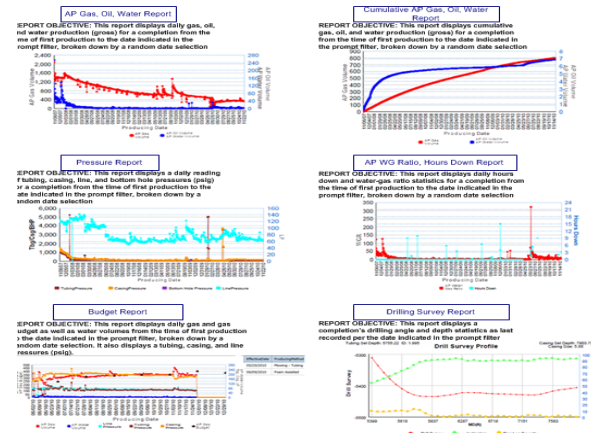
Maintenance Trends

Downtime Exceptions

Production Surveillance Analysis

Bring together well information from multiple data sources

- Compile information from multiple operational data sources to understand capabilities of a single well/or multiple wells (producing and injecting), pumping performance and associated costs.



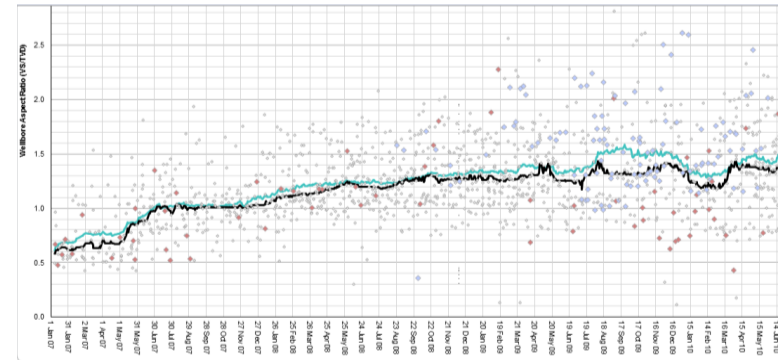
Production Volumes, Well Conditions, Drilling Surveys, Budget Reports

Taking it to the Next Level

Use advanced concepts to predict and react to scenarios

Predictive Analysis

- Analyze key data points (e.g. pressure maintenance, gas injections) to identify trends and opportunities for well recovery
- Use advanced data mining to simulate possible scenarios to understand well and reservoir behavior



Recovery Volume Trends



Financial Planning

Line L&L Group Description Completion Report					
Group	Code	Year Down	Year Up	Reason Code	Description/Completion
7384	06-20-00-10	5.1	3.8		
7385	06-20-00-10	18.2	23.9	POLC	Partial Completion
7391	06-20-00-10	18.2	23.9	POLC	Partial Completion
7392	06-20-00-10	18.2	23.9	POLC	Partial Completion
7393	06-20-00-10	18.2	23.9	POLC	Partial Completion

**Field Ops Data/
Performance**



**Field Technology
Potentials**



**Advanced Budget Variances
/Profitability Forecasts**

Advanced Field Data Integrity

- Manage related fields and reservoirs as a related "Asset" holistic unit
- Bring together Enterprise Planning and Operational Production Data to generate advanced profitability and production forecasts

Polling Question #3

How would you describe the maturity of your enterprise with regard to analytics capabilities?

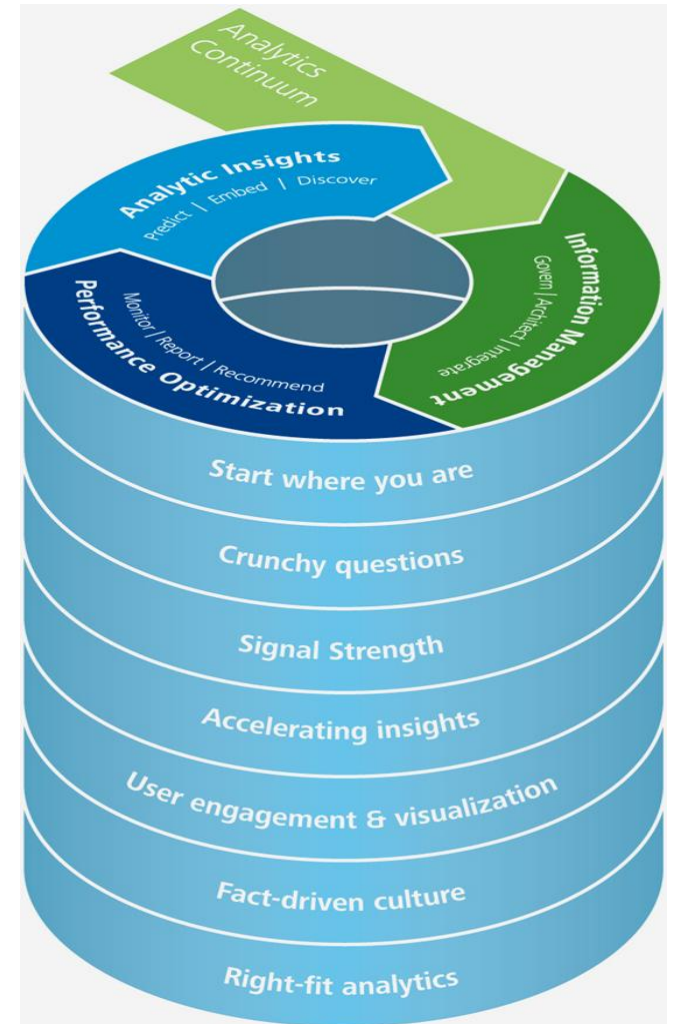
- a. Competing on analytic capabilities
- b. Analytics is becoming part of everything we do
- c. Strong in certain domains
- d. Localized or limited use of analytics
- e. Analytically impaired
- f. Don't know/not applicable

Analytics Journey

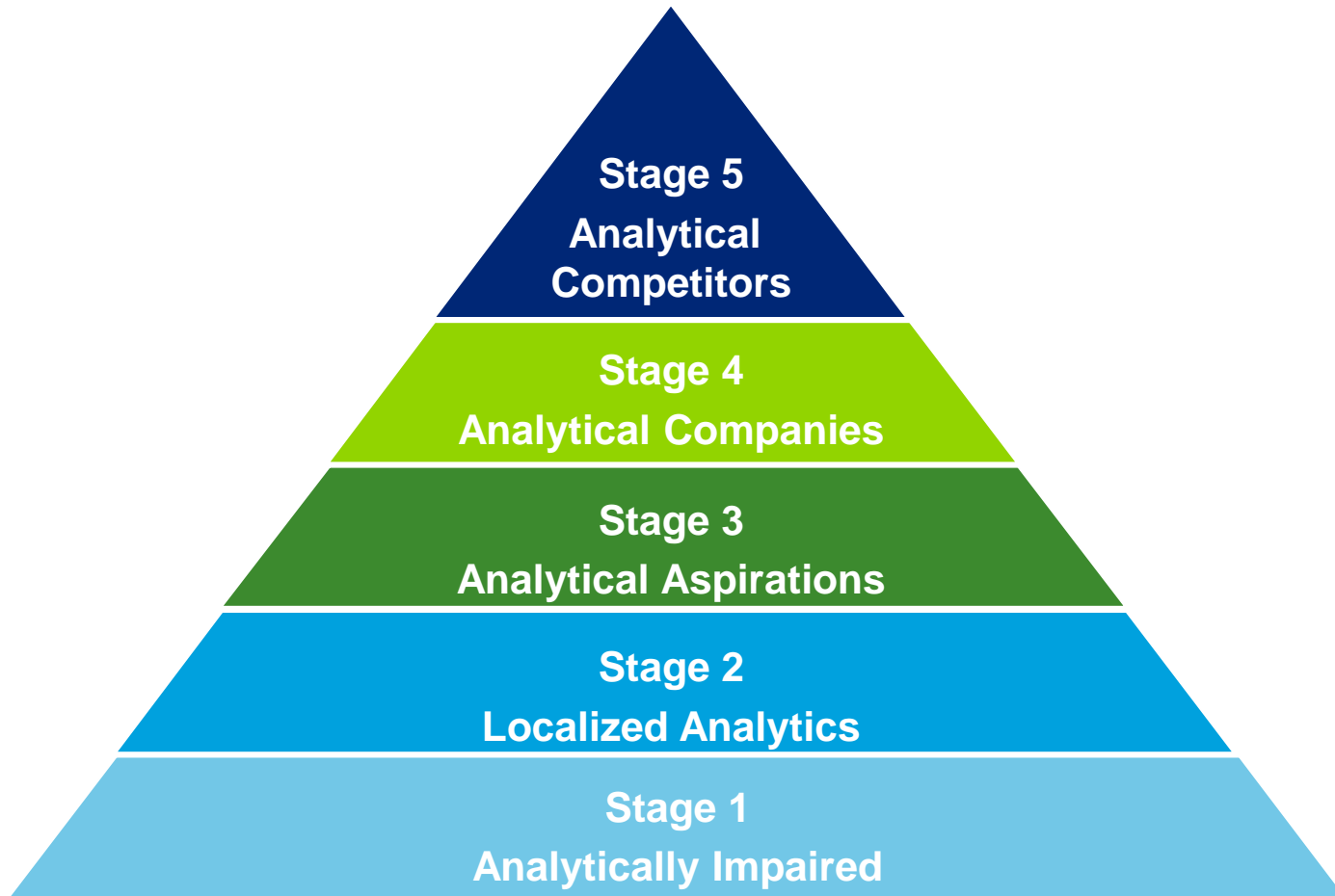
Analytics applied — getting it done

No matter where you enter the cycle of business analytics, the challenges of execution and adoption are similar.

Leading organizations tend to embrace certain specific principles to accelerate workforce adoption and capture value.



Starting where you are



Where are you on the maturity continuum?

Poll Question #4

What do you see as the biggest barrier to becoming more proficient with analytics across the enterprise?

- a. Lack of compelling business case
- b. Concerns about quality of data
- c. Organizational silos
- d. Insufficient executive sponsorship
- e. Insufficient technical expertise to deliver
- f. All of the above

Keys to Successful Analytical Initiatives

Value-driven rationale

Develop a road map linked to questions, KPIs, and challenges and opportunities associated with achieving those objectives

Integrated structure

Integrate the initiatives and projects required to address the data- related issues, challenges, and opportunities into a common structure for managing progress and measuring value across the enterprise

Coherent enterprise-wide end-state

A common end-state architecture and data governance framework underpins delivery of improved access to high-quality information across the enterprise

Dynamic, evolving program

The road map should be designed to evolve. Plan to continually enhance capabilities and refine focus of analytic priorities

The analytics journey

- Analytics is a cycle of improving business process performance, not a project
- Focus on high-impact areas, meaningful measures, available signals
- Move beyond hindsight reporting to analytics that can facilitate deep insight and foresight
- Encourage a fact-based culture that values the opportunities evident in information over instinct, conjecture or speculation



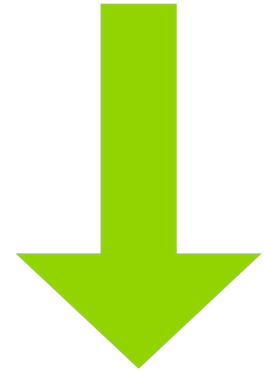
Questions and Answers

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