How to win in a "zero sum" game

by Ole Evensen, Business Development Executive, IBM WW Chemical & Petroleum Upstream lead

Ole Evensen
Business Development Executive,
IBM WW Chemical &
Petroleum Upstream lead

The primary approach to add oil and gas reserves is through exploration. The recent years increase in "Proved Reserves Addition Cost" (PRAC) has been a growing concern, and the 60% drop in crude prices since the summer of 2014 finally changed the game. Today it may be cheaper to buy resources than to explore and develop new. Business Development, buying and selling licenses or assets, has become the game no company wants to miss – but how will you compete?
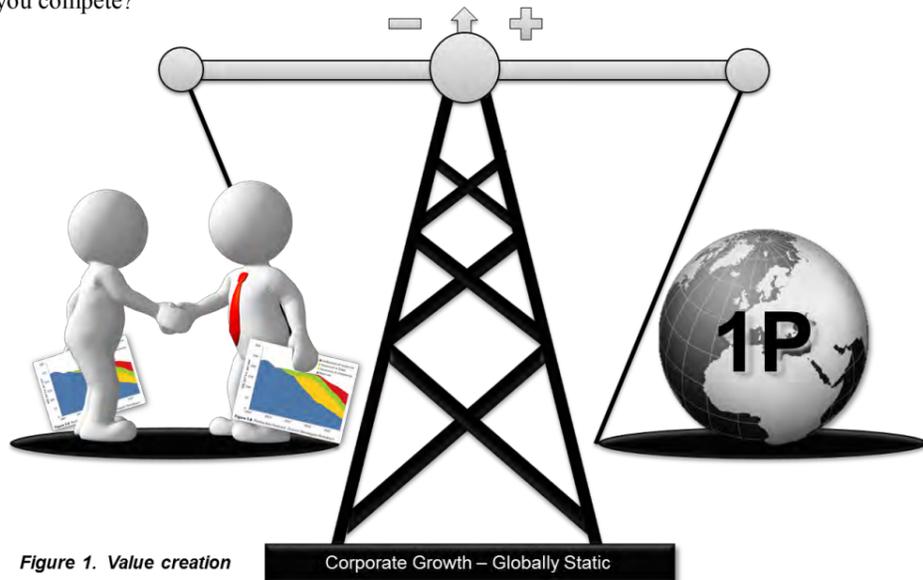

Figure 1. Value creation

The intrinsic challenge is that one company's upside implies the counterparts downside. Good Buy = Bad Sell. Like playing poker basically is a redistribution of wealth, a "zero sum game". The reality is different, but from an global perspective it does not add value – as the effort does not involve discovery and addition of new hydrocarbon reserves. It is basically a change of ownership – or a new cut of the "cake of proven reserves". (See figure 1)

The lack of proven reserves addition will influence "the game". As economically producible reserves decline and exploration effort remains low, the supply outlook will drop. This will eventually support oil price recovery. Simply stated; with a global Reserve Replacement Ratio

(RRR) of less than "1" the production volumes – and low prices – are not sustainable. The current "window of opportunity" to buy heavily "discounted" reserves will close. But, until this happens, we will see asset distribution and competitive positions change, favoring cash rich and agile "portfolio players".

Business Development, in all aspects of Upstream, whether Mergers, Acquisitions, Divestments, Farm-In/Up/Down/Out – have always been critical to realize an oil company's strategy. Lack of exploration success have been supported by commercial reserves adjustments. With the reduced exploration programs and even debooking of reserves – the commercial Portfolio

Management is no longer a side act, it has taken a leading role – and will remain until exploration efforts are revitalized.

The label "Zero sum game" will provoke people who will argue that "different approaches to value creation" is an element of trading. One man's7 trash may be another man's treasure. We can imagine buyers advocating a transaction by calculating synergies with existing fields, unique capabilities to increase recovery rates or fulfilling strategic or contractual obligations. I agree! A deal will always have a elements of unique value creation. The intent is frequently not realized, and a number of acquisitions ends up as "same cash-flow with new owners". It still may make sense from individual companies

About author
Ole Evensen *is Global Upstream Leader in IBM Chemical & Petroleum unit. He has more than 20 years international experience from working with Oil & Gas and Services companies where he has been a strategic advisor and program manager for operational improvement initiatives. As a consulting partner he has served National and International Oil Companies in Europe, Middle East and Africa. His current focus is E&P operational improvement, where new technology can utilize unstructured and real-time "big data" for optimization and better decision support. His academic background is from Harvard Business School, MBA degree from Henley Management College, a Bachelor's Degree from UiS. He is a regular speaker at industry events, writer in industry journals and host a blog in IBM Insight on Business – WW Chemical and Petroleum. Linkedin: https://no.linkedin.com/in/evensen Mail: ole.evensen@no.ibm.com*

perspectives, as they may have different cost - and availability - of capital, willingness to risk – and tax positions. However - it still has zero direct impact on global reserves.

How do you play the "zero sum asset game" - and create a competitive advantage?
As in all "games" there are some qualifying criteria. Capital is critical, and for many oil companies a serious challenge. The power balance will favor the party with capital and efficient decision making.
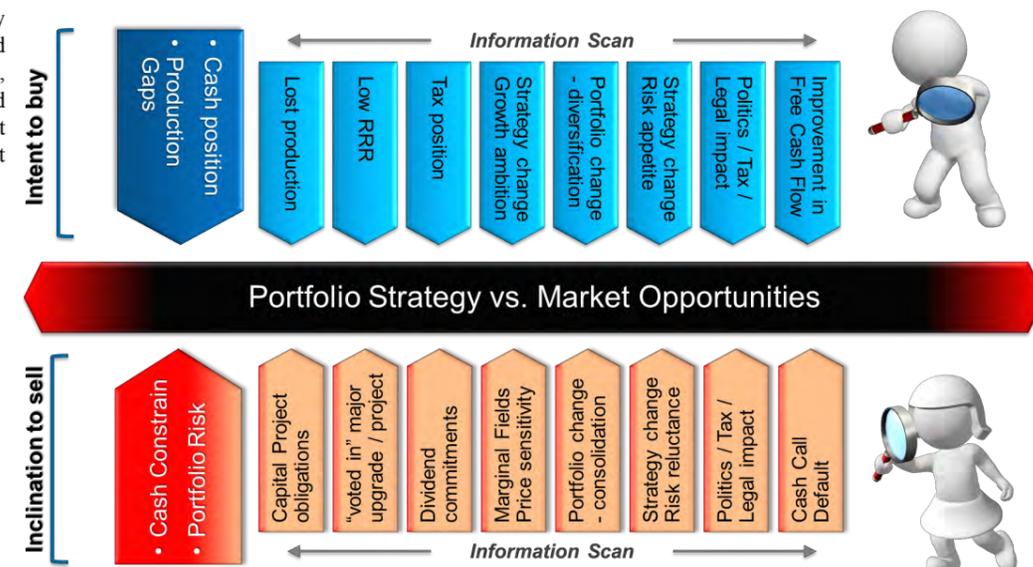

Figure 2. Market Intelligence – Cognitive Analytics

The challenge of creating shareholder value through Business Development is to create a competitive advantage. To illustrate the point: In a transparent market – where all information is available to all parties – the outcome would be expected to be equal opportunities - and prices based on supply and demand balance. The reality is that the Oil & Gas market is not transparent, therefore not an "even playing field". The key to succeed is to create an "Information Advantage". Imagine an "Information Asymmetry" favoring you –enabling you to identify opportunities – ahead of others, to analyze the situation and create a proposition that builds on your strengths – and your understanding of the transaction partners weaknesses and needs.

New Information Technology will play a key role to realize this – to identify "information indicators" that can help us understand if a company will be inclined to sell – or have an intent to buy. Having analytics technology that can scan tens of thousands of news sources for "information signatures" of distress, key challenges or strengths – will provide such an information advantage. A new generation of analytics technology – referred to as "Cognitive Analytics" does this today, in other industries. It is now adopted by Oil & Gas companies who wants to exploit the current

window of opportunity, and permanently "up the game" of Business Development.

The differentiating technology to realize these ambitions must be able to access, understand and contextualize a number of traditional as well as previously "difficult to use" information sources. Providing insight and perspectives that is not readily available to competitors, in a timeframe that allows for a speed or fist-mover advantage is what we label a "Positive Information Asymmetry". Information is a strength when it may provide a competitive advantage. It is similarly a weakness if is "ignorance" – when you do not have the insight your competitors have. While traditional analytics is a basic capability in most organizations, the "Cognitive" dimension implies the ability to analyze and interact with what we refer to as unstructured data. Most of the data we use every day is unstructured, from the newspaper we read, the radio we listen to, on-line sites we access to explore, reports we read, studies we initiate, governmental or corporate information sharing etc. About 80% of all data in an organization is unstructured – and is today "hidden" from traditional analyses.

Creating the Information Advantage
Imagine the work-flow, or process, that describes the

activities to acquire equity in a field. You will find key steps that require analysis, calculations and simulations, but the most critical steps is in the interaction with unstructured data. This is where the recipe to success in the "zero sum game" is created. Consider the following high level work-flow:

Identify Market Opportunities – earlier than competitors. When it is common knowledge that a company will be divesting assets, you will find logical explanations – or "drivers" that may explain why. These drivers are the early indicators a Cognitive system have the capability to monitor. It may be "first news" indicating that a company will be in a cash squeeze – where selling assets is a likely outcome. One piece of information may not show the full puzzle, bet when you imagine coinciding news like – "we will maintain dividend policy" or "we have sanctioned project X" as well as "Cost overrun on project Y" – the picture becomes clearer. Collectively it can create a "probability of intent" to divest. See Figure 2.

Recognizing intent ahead of competitors may help us:
- *Create a better Win/Win proposal*
- *Execute transaction, (Due diligence)*
- *Learn from transactions.*

The question will naturally be "what". This is where more

competitive intelligence will help clarify the picture. There are a number of news, public and private sources that can help you establish a view of competitors portfolios – with associated information about the assets prospectivity, free cash flow, capital expenditure and timelines. In situations of cash constraints it will be more likely that a company will divest assets with low generation of free cash flow, capital obligations – and even risks. While the information is not evidence, it will allow you to generate scenarios of competitive behavior. If you have identified companies with specific assets of interest, you may select to *Monitor & Detect* information from these companies – to see information patterns that may be favorable to your strategy. To succeed, you must...

Understand buyer/seller situation → Or a "Comparative *SWOT*". Any E&P company must have a picture of its **S**trengths and *Weaknesses*. This will shape strategy and help the company pursue *Opportunities* that are most in line with its **S**trengths - while understanding **T**hreats – in consideration of *Weaknesses*. Your understanding of your own SWOT becomes more meaningful when you compare it with a possible transaction partner or competitor. Imagine you are a minor oil company with restricted access to cash. With an "information advantage" you may

Figure 3. Cognitive Analytics example http://news-explorer.mybluemix.net
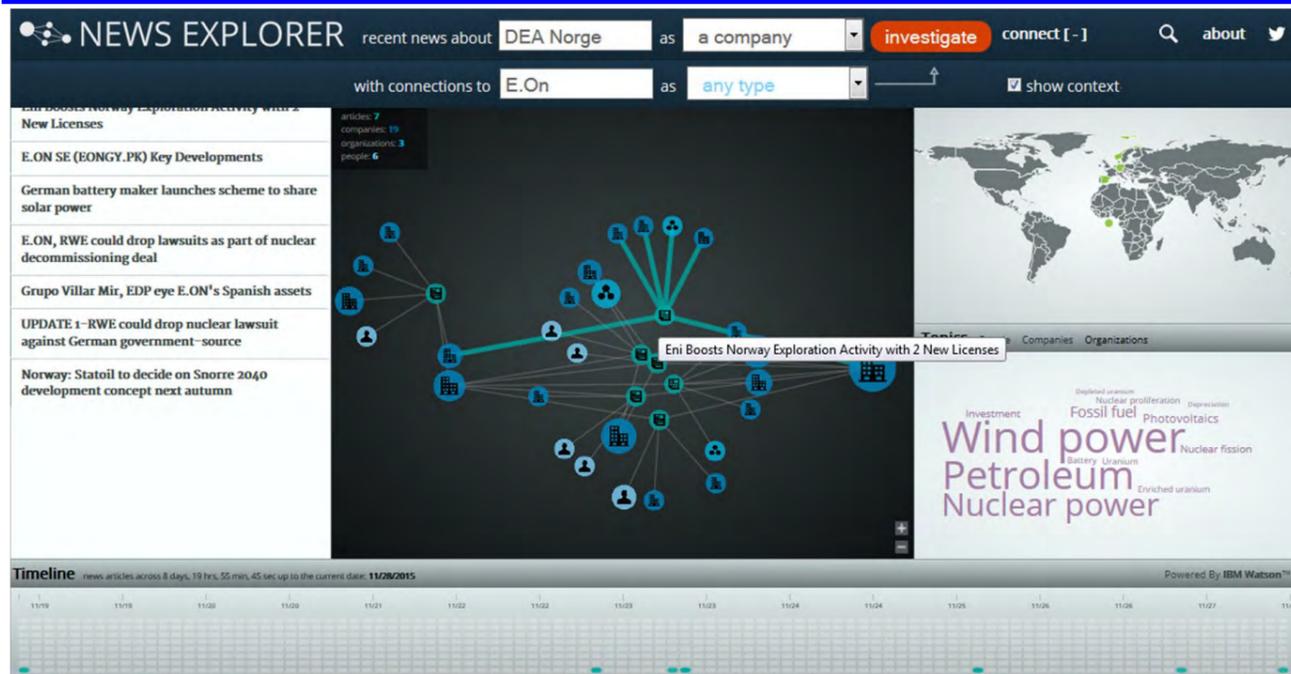
be the first to approach a company and propose an asset swap, rather than a cash transaction. If your owner is a Private Equity company they may appreciate a higher risk in the portfolio than a company with a wide shareholder base. Understanding your SWOT is key to the next step...

Construct Win/Win proposal. Understanding the situation of a transaction partner may come from a study or subscribing to trusted advisors. The flip-side is that the same information is athers.ation assymetry - benefitting at can create he supermajors will move faster than the mid-cap and more agile companies. I vailable to others - hence no information advantage. You will certainly benefit from having this information to establish a basic understanding of transaction partner, but *your advantage will come from your ability to add color and facts to the picture that is available to everybody*. Capital market presentations, general IR information, governmental web-sites, news quotes etc. may offer valuable insight into aspects that can help construct a proposal. It may be reserves challenges, portfolio skew, country presence, asset level challenges, country risk, governmental relations... Understanding a transaction

partner is Vital. It is however surprising how "limited" view corporate Portfolio Owners sometimes have of the organizations own assets. Hence the last key reason to introduce cognitive analytics...

Understand Internal Portfolio situation – should be considered basics. Working with Business Development and Portfolio Managers has learnt me that the reality is different. Most oil companies have applications or databases that can aggregate a portfolio view for all fields, where reserves, investments, projected production and contingent resources can be viewed. The challenge is the assumption that the data represents undisputable facts – "one truth". *As an example:* Is the data used to prioritize our portfolio – such as production profiles, reserves growth projections, investments, budgets etc. – credible and reliable? If you want to nominate candidates for divestments – under capital constraints – would you not consider aspects such as: Assets history of delivering on promise? Production, OpEx, cost improvement, improved recovery, facility integrity, commercial agility. What about the next team – dedication to one/many assets, experience related to asset challenges or even

turnover/stability. You want to see the potential Upsides, Downsides and Risks that does not come from consolidated numbers. A number of information sources may help answer these questions. If the asset is Operated By Others (OBO) the same answers must be answered, and in addition – consider if the asset is a priority asset in the Operators context.

The information to assess and understand other operator is available, from unstructured data sources containing joint operating agreements, commercial agreements, budgets, reports, audits and the information generated in license committees. A Cognitive Analytics tool may also continuously scan news sources to identify challenges.

An example, Figure 3, illustrates a Cognitive News-scanner (available to try) that discovers connections between Organizations, Companies and People. The "Topics" analysis shows the most frequent key-words, the map shows where data is captured and the data sources (news feeds) where the data originates from.

Lessons Learned. The final aspect of succeeding in any game – is to learn from history, whether success or failure. Even Cognitive

Analytics cannot help you improve if you do not assess yourself. Conducting a "post deal review" should be mandatory and comprehensive. Did the transaction meet our expectation and valuation, reward and risk? If yes / No – above/below - then why?

A review will provide valuable insight into the suitability of their decision making process, stage gates – and become a valuable addition to the data made available to your Cognitive systems. It may turn up as a valuable "relevant analogy for comparison" when a new opportunities is being assessed.

While it is hard to predict future oil prices, and for how long Exploration will remain in the shadow of trading – it is not hard to predict that the companies with an information advantage will end up in a better position. My curiosity is whether the supermajors will move faster than the mid-cap and more agile companies. It will also be interesting to see how organizations ignoring new analytics technology will face the "information disadvantage" – and try to defend their position.

Why Are Reservoir Forecasts So Optimistic?

by Dr. W. Scott Meddaugh

Short Summary of the SPE 2015-2016 Distinguished Lecture

Dr. W. Scott Meddaugh

An SPE paper by Nandurdikar and Wallace (2011) reported that petroleum industry projects produce on average only about 75% of the oil and/or gas forecast at the time of project sanction. For those projects that the authors attributed the production shortfall to reservoir "issues" (as opposed to well, facilities, or "other" issues), the average project produced only about 55% of the forecast volumes. They highlighted possible sources of forecast optimism including optimistic subsurface assumptions, failure of internal assurance processes, and the lack of accountability for production volumes including project/decision look-backs. Ravjvanshi et al. (2012) also highlighted the tendency of production forecasts to be optimistic and suggested possible causes including unrealistic subsurface assumptions, reservoir modeling limitations, and human bias. Merrow (2011) noted that the industry tends to make project decisions based on insufficient "Basic Data" and that technical teams understanding of their "Basic Data" is limited by their "misplaced confidence that they understand a reservoir based on nearby producing fields".

Several possible contributors to forecast optimism were highlighted in the talk including the potential impact of (1) sparse data; (2) geostatistical modeling parame-

ters such as the semivariogram range; (3) geological model upscaling; (4) dynamic model grid parameters; (5) well location optimization workflows; and, (6) "pro-project" human bias. Based on results summarized by Meddaugh et al (2011) and Meddaugh (2015) the largest contributors to forecast optimism are "pro-project" human bias and dynamic model grid parameters (e.g. small models with relatively "large" grid cells). Each of these may account for about 25% of the observed forecast optimism. Sparse data may also have a similarly large impact but only if discovery and early appraisal wells are drilled in so-call "safe" regions with better than average reservoir properties. Well location optimization workflows and areal upscaling are likely moderate contributors to forecast optimism, each accounting for perhaps 5-10% of the observed forecast optimism. Geostatistical model parameters and vertical upscaling are overall minor contributors to forecast optimism, each accounting for perhaps 2-5% of the observed forecast optimism.

A number of workflow improvements can reduce forecast optimism including: (1) incorporating larger range of uncertainty – respect the potential impact of sparse data as well as the potential "non-randomness" of sparse data; (2) use reservoir models with

smaller areal grid block (cell) sizes; (3) increased use of actual reservoir lookbacks to assess impact of sparse data on in-place volumes and forecasts; and, (4) increased use of independent external peer reviews to reduce pro-project team human bias.

References

Meddaugh, W.S., N. Champenoy, W.T. Osterloh, and H. Tang, 2011. Reservoir Forecast Optimism - Impact of Geostatistics, Reservoir Modeling, Heterogeneity, and Uncertainty, SPE 145721, San Antonio.

Meddaugh, W. S., 2015. Improving Reservoir Forecasts by Understanding the Relative Impacts of Sparse Data, Reservoir Modeling Workflow and Parameter Selection, and Human Bias, SPE 175009, Houston.

Merrow, Edward W. 2011. Industrial Megaprojects – Concepts, Strategies, and Practices for Success. John Wiley & Sons, Inc. New Jersey.

Nandurdikar, N and L. Wallace, 2011. Failure to Produce: An Investigation of Deficiencies in Production Attainment, SPE 145437, Denver.

Ravjvanshi, AK, RG Meling, and D. ten Haff, 2012. Instilling Realism in production Forecasting: Dos and Don'ts, SPE 155443, San Antonio.

Biography:

Joined the Midwestern State University in 2013 as the RL Bolin Distinguished Professor of Petroleum Geology after has 32 years with Chevron's technical and research companies. Experience includes reservoir development projects mainly in the United States, Canada, Venezuela, Middle East, West Africa, and Australia. Served as Subsurface Team Leader for a major capital steamflood project in Kuwait/Saudi Arabia while posted to Saudi Arabia Chevron from 2009-2013.
Member of the SPE, AAPG, EAGE, SEG, and GSA. Associate Editor for the SPE Reservoir Evaluation and Evaluation Journal and technical editor for a number of industry technical publications.
Received a PhD in geology from Harvard University in Geology. He has authored or co-authored over 30 peer reviewed and SPE technical papers on forecast optimism, reservoir characterization, and modeling and has presented over 100 talks at technical meetings worldwide. Major interests are reservoir characterization and development forecasting, geostatistics, and uncertainty assessment. Developed and led over 100 public and private short courses in geostatistics, reservoir modeling, and uncertainty assessment.