



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 available 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 websites, 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 asset 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 keywords, 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 "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) "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 project team 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 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-called "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

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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.