

How to make good decisions

Palantir Solutions hosted a seminar in Aberdeen about how to make decisions and use decision analysis tools. *By Dr. Bart J.A. Willigers, senior consultant, Palantir Solutions*

Palantir Solutions held a seminar about decision analysis tools in Aberdeen, U.K. on Nov 30th, which was attended by Shell, ConocoPhillips, Gaz de France, Chevron, Dana Petroleum, RDS and UKTI.

Decision analysis tools and processes are used by the oil and gas industry to optimise the allocation of financial and human resources to a portfolio of projects developed by a company.

The decision analysis process is typically driven by multi-disciplinary teams who plan the development of the asset.

During the process the team will investigate alternative options on how to develop a project and assess the risks, expected gains and feasibility of different development options.

Key findings are communicated to the decision makers who assess the expected value of the individual project in the context of the corporate portfolio of projects.

Decision tools include complex models that determine the expected production from a hydrocarbon reservoir, economic models that address the commercial aspects of an asset such as hydrocarbon prices, tax systems and required investment, for example, as well as a number of "softer tools".

These tools enable companies to assess whether the analysis supports the decision at hand, all relevant aspects of the asset have been assessed and whether the preferred development scenario is aligned with general corporate guiding principles.

One of the world's foremost experts on the subject of decision analysis Reidar Bratvold, Professor of Petroleum Investment and Decision Analysis at the University of Stavanger, gave a talk entitled "Decision-making in the Oil & Gas Industry - A culture of mediocrity".

In his presentation Professor Bratvold discussed several inconsistencies and misconceptions between common practices in decision analysis and the corporate promise to maximize shareholder value.

Betting on a coin

Professor Bratvold illustrated the concept of risk aversion with a simple experiment. He asked the participants at the seminar whether they were willing to invest in a "coin flipping venture". A business partner in the venture would receive triple the amount they entered if their guess, Heads or Tails, were to be realised after a coin flip.

All the attendees to the seminar were keen to participate in the investment proposal given an upfront investment of £10.

However when the experiment was repeated at increasingly higher stakes fewer and fewer participants were willing to take the "gamble", although the expected rate of return remained the identical.

Professor Bratvold concluded that the participants, just like typical oil and gas companies, were risk averse in their decision making. As soon as the potential loss gets large enough to "hurt" or potentially bankrupt a company, managers hesitate to enter the venture.

The risk averse attitude, in terms of financial risk, adopted by the majority of players in the E&P industry has resulted in a decision making culture which systematically aims to reduce the exposure to risk.

Professor Bratvold argued that this frame of mind frequently causes companies to sacrifice a large potential upside in order to mitigate a much smaller potential downside.

The return on diversified portfolio of stocks will be maximised if the companies represented by the stocks are risk neutral, not risk averse, in their decision making. The risk averse attitude is therefore in conflict with the interests of a well diversified investor.

Struggling with risk

Many companies struggle with the concepts of uncertainty and risk and in particular how to manage risk.

Professor Bratvold illustrated this point by the following statement made by a project manager in the oil and gas industry: "We use P10, P50 and P90 investments estimates in all our valuations". Subsequently he addressed one of the engineers by saying, "I want your guarantee that we don't spend more than the P50 on this project".

[A P10 estimate is considered 10 per cent likely; a P90 estimate is considered 90 per cent likely]

This statement suggests that the project manager does realise the importance of quantifying uncertainty by stating that it is standard practise to develop different probability weighted estimates on the required investment.

However, the second statement clearly demonstrates that the manager does not understand the implication of a P50 estimate.



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The likelihood that the investment is higher than the P50 is actually 50%, a guarantee for a ceiling to the required investment would be given by the P0, which is by definition an infinitely high number.

The implication of this misconception goes beyond the semantics of decision making. By demanding a guarantee that the investment will be less than the P50, the engineer will be inclined to propose a P50 estimate which is higher than his true expected P50 estimate.

This results in the expected investment requirement increasing and the company is risking walking away from a profitable investment opportunity.

Improvements in corporate portfolio management can only be achieved if all stakeholders involved in the strategic planning and decision making process have a clear understanding of risk modelling and management.

In order to achieve this companies should improve their planning, decision analysis procedures and embrace more probability-based and modern valuation techniques than those typically used today.

"It puzzles and surprises me that companies have no objection to embrace very intricate procedures in their subsurface modelling whilst the same companies are very reluctant to adapt any enhancements in their financial modelling", Professor Bratvold concludes.

Palantir seminars

The seminar held in Aberdeen, U.K. was the first in a series, free of charge, hosted by Palantir Solutions. Over the coming months Palantir will announce the next one.

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