Dynamic Portfolio Management and Stochastic Analysis for Value Creation and Asset Optimization

Case study: PETRONAS uses Merak software for corporate-level portfolio management and risk analysis

**Challenge**
- Standardize data collection and portfolio management to better assess all business segment projects
- Capture technical, price, and country risks of an integrated, global energy company
- Provide comprehensive system output to support management strategy and investment decisions

**Solution**
- Merak* Capital Planning (CP) software for strategic portfolio management
- Merak Results Broker to capture Excel®-based project data
- Stochastic risk analysis to assess “what-if” scenarios

**Results**
- Removed process limitations and workflow constraints
- Introduced new performance metrics and trade-off analysis for alternative portfolios
- Reduced time spent on data manipulation, increasing time for analysis

**Create corporate value and business resilience**

PETRONAS, wholly owned by the Malaysian government since 1974, has grown substantially over the past few decades. It is currently ranked among the 500 largest global corporations in the world, with operations in more than 33 countries. PETRONAS has also diversified its capabilities beyond oil and gas exploration and production (E&P), and its data processing and forecasting needs have grown in proportion.

As part of PETRONAS’ recent portfolio management capability development initiative, the Corporate Planning and Development Division (CPDD) set an objective to produce meaningful analytics from all its accumulated project data. The results would be used to enhance strategic planning, improve investment decision making, and reduce risk across the company’s portfolio.

The project called for a scalable, flexible portfolio management solution that would enable corporate planners to explore high-quality portfolios, add their own expert business acumen, form alternative capital plans (“what-if” scenarios), and ultimately create compelling and informative presentations for management review.

*A conceptual view of risk by project and portfolio, where critical projects are essential to, and liable projects are detrimental to, portfolio strategic goals.*
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**Develop an integrated approach**

**Consolidate data for efficient analysis**

An immediate task of CPPD was to analyze large amounts of data—approximately 1,000 projects—and present the results to PETRONAS’ management committee. Schlumberger Information Solutions (SIS) met this business goal with an integrated approach to portfolio management, using Merak CP and Merak Results Broker as the core system components for effectively capturing, processing, and analyzing the data.

**Provide more detail**

The new Merak implementation resolves previous constraints by enabling PETRONAS to perform detailed data analysis and reporting at a more granular project level. Data can still be consolidated or aggregated at a higher level to address specific business issues that the company would like to further analyze.

**Formalize risk management practices**

Another company goal was to formalize risk management practices. This is particularly important for the oil and gas industry and especially for fully integrated companies that operate in emerging markets where political unrest and economic uncertainty can be destabilizing factors that pose threats to business. The SIS/CPDD collaboration team used the new process to model high-priority projects, applying a stochastic analysis method to evaluate various risk factors and identify strategic, critical, and liable projects.

Data was captured at the source into datasets, and events were assigned probabilities. Performance metrics and strategies (rules, goals, constraints, dependencies, and correlations) were then defined before optimization. In this case, three different types of risks were identified—country, technical, and price—and modeled in the system. Of these, the technical and country risks were project-specific, or nonsystemic, whereas price risk was considered systemic since it applied to all projects being analyzed.

**Predict successful outcomes**

PETRONAS is benefiting from a new portfolio management practice that captures more risk profiles, allows more control variables, and provides an easier way to slice and dice data. It now has the portfolio management process and technology needed to analyze and forecast an ever-growing number of projects. These new capabilities will ensure that strategic direction and investment decisions are not purely based on expected value creation but take into account all the parameters that impact a successful outcome. Going forward, PETRONAS will be able to more fully analyze an integrated database of current projects and more reliably predict the portfolio impact of future projects, without being limited by system functionality or workflow constraints of the past.
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CPDD decision tree that illustrates risk combinations and possible outcomes.

Risk-distribution curve that shows impact on data when different types of risk are considered.
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Management has also been given valuable insights into sensitive areas that help to focus efforts and prevent loss. This dynamic set of solutions gives PETRONAS the ability to select the optimum portfolio for capital investments, express the collective associated risk, decide when to invest, assess the impact of resources constraints, and simulate speculative projects to determine which type will add more value to the corporate portfolio.

Example of data slicing and dicing capabilities, showing contribution to total portfolio value by selected countries.

Finally, during the course of the implementation project, modifications were made as necessary to existing work processes, which hastened the changes in mindset and corporate culture required for successful adoption of the new systems.

Schlumberger Information Solutions

Schlumberger Information Solutions (SIS) is an operating unit of Schlumberger that provides software, information management, IT infrastructure, and consulting services. SIS enables oil and gas companies to achieve breakthrough team performance, unlocking the potential of E&P teams to step-change their effectiveness and productivity. Through our technologies and services, oil and gas companies can drive business performance and realize the potential of the digital oil field.

E-mail sisinfo@slb.com, contact your local Schlumberger representative, or visit our Web site to learn more: http://www.slb.com/content/services/software/valuerisk/index.asp.

“Merak Capital Planning is an amazing data mining tool and exceeds our slicing and dicing requirements! The flexibility for us to deal with voluminous data is great.”

Jasmine Syed Mohamed, Manager CPDD