

# Mega-Project Management: Reducing Risk & Complexity Across the Value Chain

ORACLE WHITE PAPER | DECEMBER 2014





## Executive Overview

Mega-projects have become commonplace in the oil and gas industry. Offshore oil and gas development increasingly tilts toward the mega-project scale because of the burgeoning exploratory success the industry is enjoying in ultra-deep waters, where development projects costs routinely run into the billions and schedules can span half a decade or more.

In the downstream side of the industry, some of the new grassroots capacity additions qualify as mega-projects because of the long timeframes and the billions of capital costs that are incurred. Such projects entail enormous challenges in logistics planning, scheduling communications, data management and risk analysis. With mega-projects comes a great need to better collaborate and share information across the value chain that ultimately will drive down costs and increase the accuracy of delivery dates. Owner-operators, contractors, and suppliers working in the petroleum industry all must find innovative solutions to minimize complexity and risk in these massive undertakings, as it becomes a top priority to have all players on a project team work more closely together.

Refiners and petrochemical producers over the decades have often grappled with low margins for their products amid the turbulent ebb and flow of commodity prices and supply/demand shifts. Concerns over emissions and safety have long been trouble spots. However, now we see those concerns not only heightened but expanded to include carbon emissions – and the consequent demand for alternative fuels that threaten refiners' markets and petrochemical feedstock costs. Overriding all of these concerns, however, is that of market balance: With all the daunting macroeconomic challenges of supply and demand, how can we ensure an acceptable payoff from a downstream mega-project? Can refinery and petrochemical plant operators optimize capital and operating costs while addressing safety and environmental concerns in a perpetually low-margin environment? How can processing plant operators streamline turnaround schedules to minimize costs and downtime over the long term?

An increasingly complex and volatile business environment requires sound solutions for downstream oil and gas companies seeking to mitigate risk, enhance efficiencies, and rein in costs while planning, building and commissioning mega-projects. Enterprise Project Portfolio Management (EPPM) solutions, like those from Oracle, provide collaborative tools to help meet those goals. In addition, EPPM solutions can maximize collaboration and integration, provide real-time and uniform program visibility and predictability in a way that goes beyond traditional solutions to optimize the value of a capital asset throughout its lifecycle.



## Introduction

In its world energy outlook, IEA forecasts over \$19 trillion in global oil & gas capital spending from 2011-2035.<sup>1</sup> At the same time, the number of complex, multi-billion-dollar projects continues to grow—such as Inpex \$34 billion LNG project in Asia and Saudi Aramco/Sinopec's \$10 billion refinery project—to name just a few.

What's driving this trend? First and foremost, an increasing global demand for oil and gas, leading companies to react by building new capacity, according to IDC's Energy Insights report.<sup>2</sup> Sustained high oil prices also enable mega-projects and give companies the capability to make investments.

Another notable shift—companies are pursuing unconventional resources, which have led to the explosion in development of shale gas, tight oil, and oil sands projects. Finally, mega-projects are required to carry out much more difficult projects, particularly deepwater offshore projects.

## Increasing Complexity

More remote and demanding environments, such as deepwater offshore and arctic locations are adding to the physical complexity of these projects, while an increasing number and makeup of shareholders complicates project management. Typically, projects involve owner/operators, the EPC firm, contractors and suppliers. But today, governments, regulators, financiers and joint venture partners have joined the fray, making things more complex, and changing regulatory requirements vary greatly country to country and jurisdiction by jurisdiction. Fears over the availability of talent and resources for these projects also add to their complexity.

It's no wonder why cost and schedule overruns are common.

In a Booz Allen Hamilton study of 20 oil and gas companies, more than half were dissatisfied with overall project performance. Projects also frequently exceeded budget and time projections by more than 10%, and overruns were more prevalent in large projects of less than \$1 billion in value.

A similar study by Accenture of 30 energy companies revealed that only 30% of companies delivered all projects to the approved budgets, and only 15% of companies deliver all projects to the approved schedule. Projects also failed to deliver on other performance expectations, such as quality and business value.

So while projects are larger and more complex, oil and gas companies are not getting the return or value out of the projects that they expect.

Poor project performance can lead to sometimes dire consequences, such as:

- » **Litigation due to contract performance, personal injury, or environmental impact,**
- » **Potential for regulatory penalties,**
- » **Inability to meet production targets,**
- » **Destruction of shareholder value.**

---

<sup>1</sup> "IEA World Energy Outlook," IEA 2011.

<sup>2</sup> "IDC Energy Insights: Project Portfolio Management Solutions in the Worldwide Oil and Gas Industry" Webcast, International Data Corp. 2012.



With that kind of track record and consequences, why do mega-projects persist? Simply put, the economies of scale that mega-projects provide make them a necessity. More than ever, mega-project management – and the inherent risk associated with these projects – relies heavily upon collaborating and sharing information transparently and breaking down the barriers that exist not only within enterprises but between them. This requirement is especially critical for the challenges posed by long-range planning for a downstream mega-project. Given the lifecycle of assets in the industry, it's imperative to be able to plan out 30, 40, even 50 years. Likewise, other issues are top of mind, such as ROI and the ability to conduct a comprehensive assessment of a multitude of factors that determine the viability of investments.

This calls for a robust technology solution that can serve as a foundation for developing new processes to create a truly collaborative project team culture. Such a solution would enable the downstream petroleum value chain project owner-operator, contractors, suppliers and partners to:

- » **Correctly align strategy, execution and results to underpin stakeholder value,**
- » **Improve decision-making and accountability through enterprise-wide visibility, workflows and collaboration to reduce costs and deliver on goals and objectives,**
- » **Reduce financial and performance risk,**
- » **Respond quickly and appropriately to changes in strategy, customer needs, market threats and overall business uncertainty.**

Ideally, such a solution would also be specifically tailored to the downstream industry. It should offer a complete, integrated enterprise project and portfolio management solution, and be extendable to other core process industry technologies, such as enterprise asset management and enterprise resource planning.

EPPM solutions can meet these downstream mega-project requirements.

### EPPM at Petrobras

Petrobras is Brazil's largest oil and gas company—and one of the largest in the world—working to extract, produce, refine, sell, and transport oil, derivatives, natural gas, biofuels, electricity, and other renewable energy sources. The public company, whose major shareholder is the Brazilian government, has more than 100 drilling platforms, 16 refineries, and 6,000 gas stations in 28 countries.

To meet demand for diesel in the domestic market, mainly in the northeastern region of Brazil, Petrobras needed to construct the Abreu Lima refinery on time and to stay within its U.S. \$15 billion budget. To meet this goal, Petrobras adopted Oracle's Primavera P6 Enterprise Project Portfolio Management, acquiring an integrated, real-time view of the project with online access for multiple users—from the project supervisor to company executives. With the implementation, Petrobras acquired the ability to collect information regarding 190,000 activities that would be executed by approximately 40 partners throughout the construction. In addition, the company implemented Primavera Risk Analysis to avoid missed deadlines and excessive costs by calculating the probability of meeting deadlines and assessing which activities require attention.

The EPPM solution also allowed Petrobras to:

- » **Provide a detailed, real-time and online view for various projects to multiple users—from project supervisors to company executives—enabling effective monitoring of each project stage;**
- » **Ensure information security by controlling access—as each partner can view only its respective project element—while providing a consolidated view to Petrobras executives, so they can deal with unexpected events and accurately assess charges in case of missed deadlines;**
- » **Use Primavera Risk Analysis to calculate the probability of meeting deadlines, assess which activities require attention to avoid missed deadlines and excessive costs, and determine risks and impacts for each planning change to ensure refinery construction is not delayed;**

- 
- » **Integrate operating schedules for 190,000 activities associated with long-term project phases, clarifying the consequences of changes and enabling administrators to take preventative action to mitigate any negative impact on project completion;**
  - » **Enable quick development of weekly reports to support managerial decisions, ensuring assertive and realistic deadline management.**

## Conclusion

Mega-projects carry their own unique potential for project risk because of the large-scale and long timeframes.

In the downstream oil and gas industry, there is more pressure than ever to manage and reduce project risk because of increases in complexity, number of stakeholders and regulatory requirements. Across the value chain, collaborating and sharing information and data in a systematic, integrated approach takes on even greater importance in the case of a refinery mega-project.

Sophisticated EPPM solutions like those by Oracle's Primavera have been proven to reduce risk and complexity across the value chain for refiners today, especially for multi-billion-dollar mega-projects.



CONNECT WITH US

 [blogs.oracle.com/eppm](http://blogs.oracle.com/eppm)

 [facebook.com/OraclePrimavera](https://facebook.com/OraclePrimavera)

 [twitter.com/oracleeppm](https://twitter.com/oracleeppm)

 [oracle.com/primavera](http://oracle.com/primavera)

**Oracle Corporation, World Headquarters**

500 Oracle Parkway  
Redwood Shores, CA 94065, USA

**Worldwide Inquiries**

Phone North America: +1.800.423.0245  
Phone UK: +1.44.0.870.8.768711

**Hardware and Software, Engineered to Work Together**

Copyright © 2014, Oracle and/or its affiliates. All rights reserved. This document is provided for information purposes only, and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 1214

Mega-Project Management: Reducing Risk & Complexity Across the Value Chain  
December 2014



Oracle is committed to developing practices and products that help protect the environment