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Managing Utility Capital Projects Using Enterprise Project Portfolio Management Solutions

Executive Overview

Utility executives worldwide face a precarious balancing act: how to plan, build, and operate assets within an increasingly challenging business environment. A global financial crisis translates to a small pool of capital available for projects, thus driving up the cost of capital while regulatory uncertainty increases risk. Raw material costs fluctuate often, but are generally on an upward trend. Utilities face massive upgrades to aging infrastructure, so an increase in the number of capital projects in the near future is certain. The loss of institutional knowledge resulting from widespread workforce retirements within the next decade, however, leaves the current workforce at a disadvantage in managing these planned capital projects. Effective software solutions that equip utility staff – both at the executive and project level – to manage each stage of the project lifecycle will play a key role in addressing these challenges.

Introduction

Each year, utility executives must make critical decisions regarding planning, building, and, ultimately, operating projects of all sizes. Mismanaging a capital project, even a small project such as building out a short transmission line, can lead to high cost overruns, a delayed project, and missed regulatory deadlines. Challenges in managing capital projects are not uncommon, however; utility executives regularly encounter significant hurdles throughout the project lifecycle. A January 2011 *Economist Intelligence Unit* survey lists the top three challenges utility executives face: predicting long-term costs (48 percent), assessing return on investment (ROI) (33 percent), and effectively managing cash flow over the lifecycle of the project (30 percent). Furthermore, 17 percent of executives rated their organizations as “not very effective” or “not at all effective” at planning, prioritizing, and selecting capital investment opportunities.¹

¹ Economist Intelligence Unit, “*From Planning to Execution: How Top Utilities Executives Contribute to the Success of Capital Projects*,” March 2011.

The Challenges

Utility executives feel the pressure of five distinct challenges that can hamper a project before planning even begins: limited capital, costly raw materials, aging infrastructure, uncertain regulations, and a constrained workforce.

Limited Capital

As a result of the global financial crisis, capital becomes more of a critical issue. Limited availability either via the markets or internal funding means that the capital a utility does obtain for major projects is scarce, costly, and requires close management of the project to ensure an acceptable ROI. Only 11 percent of the companies (those in capital-intensive industries including energy) surveyed by the *Economist Intelligence Unit* in October 2010 report delivering the expected ROI on major capital projects 90-100 percent of the time, and 12 percent report delivering planned ROI less than half the time.²

Costly Raw Materials

Costs of raw materials, such as copper, steel, and concrete, fluctuate dramatically. For example, the price for iron ore rose 60 percent and the price for iron and scrap steel rose 150 percent between 2003 and 2006, according to an Edison Foundation Report. The report attributed the increase to high global demand and increased production costs, including the impact of high energy prices. Prices for cement and crushed stone increased 30 percent between 2004 and 2006 for the same reasons, according to the report.³ When a particular country buys up the resources that are needed for a capital project, this increases costs for everyone. Good investment management – and good project management – plans for the fluctuation in supply and costs of raw materials. The pending economic recovery will translate into increased demand for energy, increasing pressure on the utility industry to obtain raw materials at reasonable costs.

Aging Infrastructure

The power delivery system is largely based on technology developed in the 1950s or earlier and installed as much as 50 years ago.⁴ In the next few years, the utility industry will experience dramatic changes as it updates this aging grid infrastructure and strives to meet renewable energy requirements.

² Economist Intelligence Unit, *Prepare for the Unexpected: Investment Planning in Asset-Intensive Industries*, January 2011.

³ The Edison Foundation Report prepared by the Brattle Group, *Rising Utility Construction Costs: Sources and Impacts*, September 2007.

⁴ Physics Today, Clark W. Gellings, *Transforming the Electric Infrastructure*, December 2004.

Regulatory Uncertainty

Regulatory uncertainty creates risks and affects the cost and availability of capital. A Navigant Consulting/Edison Electric Institute survey of utility executives revealed that 72 percent said regulatory uncertainty was the top issue to solve to ensure a strong future for the industry.⁵ Increasing regulatory oversight will bring elevated risks, obstacles to productivity, and higher costs. The regulatory environment continues to grow in complexity. Evolving regulations could negatively affect implementation and the ROI of a capital project. Faced with an unclear regulatory environment, some utilities tend to err on the side of caution, stifling potentially innovative capital projects.

Constrained Workforce

Much critical institutional knowledge is lost as long-time utility employees retire. A large percentage of the current workforce is slated to retire within the next decade. U.S. Department of Labor statistics indicate that as of 2008, about 53 percent of the utilities industry workforce is age 45 or older, with nearly two-thirds of those workers planning to retire by 2018.⁶ As a result, capital projects must be closely managed across the lifecycle in order to prevent costly errors that could result from gaps in knowledge and expertise.

The Solution: Enterprise Project and Portfolio Management Solutions (EPPM)

EPPM solutions, like those from Oracle, help utilities effectively manage projects across their lifecycle – from planning to construction and operation. A solid solution includes three features: visibility, governance, and participation.

Visibility. The solution must enable features that provide both insight and foresight by tracking project performance and costs; modeling, and mitigating risks; and managing people and other resources across the company.

Governance. The solution should also provide a clear picture of project investments to ensure alignment with strategic objectives, “what-if” scenario planning, and automation of business processes from project idea, through execution, to completion. In addition, it should provide standards to manage best practices and capture core project knowledge that can be repeated on other projects to ensure consistency across projects and to help reduce project costs.

⁵ Navigant Consulting and the Edison Electric Institute, “*The Outlook for the North America Power Industry*”, June 2004.

⁶ United States Department of Labor, Bureau of Labor Statistics, “*Career Guide to Industries, 2010 – 2100 Edition*”

Participation. The solution should provide mobile tools, such as applications suited for smartphones and tablets, to connect office and field staff. These tools increase team productivity, speed project delivery, and improve collaboration across the enterprise and with external service providers or contractors.

Planning

Utility executives need to consider the risks and projected ROI of each potential capital project as they build their utility's portfolio. Effective project planning proves especially important in choosing the projects that will deliver the greatest value. To reduce the volume of project proposals and speed up the selection process, many utilities require a rigorous pre-planning process. According to a January 2011 *Economist Intelligence Unit* report, however, 47 percent of respondents rate their organizations as only "effective" at planning, prioritizing, and selecting potential capital investment opportunities, compared with only 8 percent who say they are "extremely effective."⁷

A competent portfolio management tool enables companies to analyze their portfolio to determine where CAPEX investments should be made, such as whether to invest more in renewables or in assets located in a certain region of their service territory. The high-level project data collected by a portfolio management tool enables the company to plan investments based on the organization's strategic objectives, regulatory requirements, risk factors, the potential ROI, and so forth.

Portfolio management software allows users to collaboratively create automated workflow and approval processes. The software enables users to present strategic objectives in measureable ways, propose initiatives aligned with the organization's strategy, and prioritize investments. To enable users to analyze data and metrics simultaneously, a software application should feature maps and dashboards. The metrics are used as the basis for "what-if" scenarios to determine the optimal portfolio mix. In addition, the solution should include workflows that expedite the approval process, and forms that streamline retrieval of information across departments using disparate systems. Investment scorecards allow project participants to rate investments based on various metrics, using, among other things, historical and future data.

The decision-making process must effectively capture and analyze the data required to link an organization's strategic objectives to execution plans. A solid portfolio management solution utilizes repeatable governance processes and consistent evaluation metrics. Using these features, the enterprise is equipped to choose investment proposals, fund strong business cases, perform "what-if" scenarios, and analyze performance progress.

⁷ Economist Intelligence Unit, "Prepare for the Unexpected: Investment Planning in Asset-Intensive Industries," January 2011.

Building

When a utility moves into the construction phase of a project – either building a new asset or replacing equipment at an existing asset – an Enterprise Project Portfolio Management (EPPM) solution should manage the process. EPPM solutions enable utility staff to review construction progress in various regions and on multiple projects.

An effective EPPM tool improves communication between all parties involved in capital projects, which utility executives identify as a critical component of the construction process. According to results of a March 2011 *Economist Intelligence Unit* survey, 29 percent of utility executives believe that more open lines of communication between leadership and management would improve the way they plan and prioritize capital projects. Better communication would also help manage the various risks associated with these projects, including cost fluctuations and changes in market demand, which 51 percent of executives said impact project success. Through an EPPM solution, all team members gain access to project information through interactive dashboards, web applications, and forms that provide role-based information. Project team members are able to communicate activity status updates, issue resolution, scope changes, and revisions to documents.

An EPPM solution should also help project managers manage incoming demand and prioritize projects based on the organization's overall objectives. Many organizations have hundreds of construction projects underway simultaneously. Not only does an EPPM solution provide traditional planning and scheduling capabilities to meet this demand but also detailed reports for regulators, shareholders, and other stakeholders.

Managing the owner and contractor relationship at both the construction and operations phases of the project proves critical to project success. An EPPM solution provides a graphic view into how people are utilized across all programs and projects, as well as their forecasted future use. Resource conflicts become apparent, eliminating delays and resource limitations. To streamline coordination and improve efficiency, an EPPM solution should include a communication function through graphical workflow modeling and interactive forms, and integrate to email and mobile devices to connect team members.

Contract management software also proves important in the construction phase. This software enables utility staff to manage the myriad of documents associated with capital projects, manage job costs, and provide overall project control. Role-based dashboards with key performance indicators serve as the centerpiece of a contract management tool. Project participants review the project status, see new issues, and identify potential problems.

As part of document management, a contract management tool provides comprehensive tracking of the hundreds of submittals associated with a capital project to ensure submittals are approved and appropriate action results. The solution should include a feature that shows who needs to act next within the approval workflow process. This accelerates approval times and design reviews, and tends to reduce the turnaround time for information requests.

The utility staff can use the contract management tool to effectively collaborate with vendors, suppliers, and other key participants associated with the capital project in order to reduce schedule delays and risk. Contract managers can use the solution to manage and review a contractor's

performance, confirm that contractors' submissions have been delivered, and ensure payment requisitions have been submitted.

An effective contract management tool should provide project management capabilities that integrate with an enterprise project portfolio management solution. It should link people, teams, and projects to provide complete control over a capital project's lifecycle.

Operating

Once a capital project has been planned and built, the tools a utility used in the first two phases continue to prove essential in ongoing maintenance of the project – both online and offline maintenance. Even small maintenance projects at an operating facility pose significant planning and scheduling challenges. The stakes rise dramatically when the project involves an outage, which includes thousands of activities that must be accomplished within a tight timeframe. Emergency maintenance makes the situation even more complicated and uncertain. A large enterprise may have multiple maintenance projects of varying degrees of complexity underway at the same time. Profitability depends, in large part, on scheduling and deploying resources in the most efficient manner across all maintenance activities. Because when you take an asset offline, you're not generating revenue.

An EPPM solution enables a utility to plan, schedule, and manage maintenance projects effectively while tracking activities down to a fine granular level. A view of resources from an enterprise level equips the utility to dispatch the right crews for each project. Project dashboards provide status reports and track key performance indicators, such as schedule and budget.

The solution also ensures coordination and communication with a multitude of contractors and vendors involved with each maintenance project. Automating the maintenance scheduling means that both contractors and utility crew members receive detailed activity assignments in real time. Having all maintenance information in one system with integration between shutdown work orders and project plans enables crews to work more efficiently. Document management of purchase orders, contracts and sub-contracts, as well as tracking deliverables and managing document revisions proves critical for maintenance projects.

This enterprise-level coordination can result in a reduction in the time required for a shutdown and a shortened procurement cycle, as well as savings in manpower costs. With Oracle's EPPM solutions, utilities can successfully plan, schedule, and execute projects across the enterprise for routine maintenance, outages, and for capital expansion projects.

Conclusion

In an increasingly volatile business climate, the asset-intensive energy industry depends on EPPM solutions to move capital projects forward through the gauntlet of challenges posed by limited capital, costly raw materials, aging infrastructure, increasing regulations, and the loss of institutional knowledge through a constrained workforce. Oracle Primavera's EPPM suite equips utility staff to plan, build, and operate successful capital projects.



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Enterprise Project Portfolio Management
Solutions
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Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Worldwide Inquiries:
Phone: +1.650.506.7000
Fax: +1.650.506.7200

oracle.com



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