Procurement Category:
Equipment, Engineering and Construction

Blueprint for large Capital Projects

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Construction spending is finally on the rise after a long lull. As the excess manufacturing capacity from the building boom of the 1990s has been largely absorbed, companies are adding new capacity in North America while growth-oriented companies continue to add new capacity to serve emerging growth markets.

With this rebound in construction activity, companies are taking great care to ensure that large capital projects are managed holistically to deliver the expected capability while meeting deadlines and coming in at or under budget. The stakes are high with typical projects carrying price tags in the tens or hundreds of millions of dollars. At the same time, many organizations have had to scale back internal headcount and resources. Many companies lack the capability to manage projects of this scope and struggle to find the right approach.

Many, in fact, opt to hire engineering, procurement and construction management (EPCM) companies to handle all or substantial portions of large capital projects rather than develop a comprehensive strategy that addresses procurement of construction services as well as equipment and materials. This may be the right approach for some projects, but in most cases, this strategy can leave millions of dollars on the table and increase the risk of cost and deadline over-runs. Although EPCM companies offer capabilities critical to the success of the project, they often lack focus and procurement expertise in areas such as capital equipment. With specialist help, companies can drive millions of dollars in savings on critical equipment while running multiple parallel sourcing streams, thus increasing the likelihood of beating deadlines.

This paper outlines an approach to large capital project delivery that emphasizes a best-in-class delivery process while controlling costs and improving chances of success.
Capitalizes on the new demand

After a steep fall in growth in 2008 and stagnation during the economic lull that lasted through January 2012, construction spending in both residential and non-residential categories is once again on the rise. Total nonresidential construction spending is expected to grow 2.3 percent in 2013 and 7.6 percent in 2014, with the strongest growth in commercial and industrial sectors.

Demand indicators are favorable with industrial/warehouse, retail and office vacancy rates expected to trend down over the next several years, while rents are expected to increase over the same period. Additionally, while vacancy rates have begun to decline there is some uptick in office construction as companies build new headquarters, facilities and purpose-built workspaces. Increased worker mobility and higher workspace density have produced a situation where companies have a 30 percent to 50 percent oversupply of office space. This level of utilization implies that companies have the opportunity to defragment their commercial real estate portfolio, and potentially use proceeds from asset dispositions to help fund new capital projects.

Add to these dynamics the effect of the boom in domestic natural gas and oil production on energy prices, and that more international companies are looking at North America as a viable destination for manufacturing (especially for products destined for domestic consumption). Outside North America, companies continue to go where the growth is, adding capacity in Latin America, Asia, and newly-emerging manufacturing sites like Vietnam and Thailand.

The resulting demand for capital expansion is global and takes several forms:

- Construction of new greenfield manufacturing plants, including new plants to serve emerging markets.
- Capital investments in the form of construction of new production lines to provide capacity for new products.
- Alterations and additions for capacity expansion or updates of existing facilities.
- Mergers and acquisitions (M&A) activity leading to decommissioning, relocation or construction of new capacity.
- Construction of new or expansion of non-manufacturing facilities: office expansions, moves and redesigns.

However, many companies lack the skilled resources, knowledge of the local market or the required supply market experience, resulting in suboptimal use of capital resources and hiring of EPCM companies. Facility managers may see an EPCM firm as an attractive and simplified way of addressing all of their needs. However, hiring an EPCM company without a strategic sourcing and procurement plan in place could cost an organization millions of dollars in lost opportunity.
Our experience with a vast range of projects spanning billions of dollars of spend and resulting in millions in realized savings suggests that the optimal delivery of large capital projects involves three major steps:

1. **Early collaboration between strategy, engineering, and procurement:** The biggest way to drive substantial value is to bring procurement to the table with engineering, manufacturing and strategic planning early (before engaging in design). This will help identify the highest value streams in the project to maximize savings and effectiveness.

2. **Define division of labor:** Leaders in this field leverage market intelligence to define the best delivery model for their project and the optimal division of labor between the EPCM company or general contractor, internal resources and other external expert partners. This includes deciding whether or not to separate engineering and construction management services.

3. **Actively manage construction costs:** It is important to understand the major construction costs buckets and their drivers, and proactively employ optimal contracting models to balance price, performance, incentives, and risk between parties. Additionally, successful project delivery includes actively auditing the project to detect issues early and plan ahead for overage and unexpected challenges.

### Figure 1. Optimizing large capital project delivery: Traditional model versus new approach

<table>
<thead>
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<th>Traditional Model</th>
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<tr>
<td>Hire an engineering, procurement and construction management (EPCM) company to oversee project, including subcontracting.</td>
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<th>Optimal Blueprint</th>
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<tr>
<td>• Use internal and/or external experts to chart and execute the overall procurement strategy, encompass the optimal delivery model and downstream pricing/contracting structures.</td>
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<tr>
<td>• Consider separation of engineering and construction tasks.</td>
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<tr>
<td>• Leave low-complexity, low-value procurement to construction company.</td>
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<tr>
<td>• Use internal and external experts to optimize procurement of high-complexity, high-value, long lead-time items.</td>
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<th>General contractor hires and manages subcontractors</th>
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<tr>
<td>• Apply market intelligence to ensure competitive rates from subcontractors</td>
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<tr>
<td>• Motivate performance by using optimal contract structures governing pricing, performance and delivery</td>
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<th>Source high-complexity items in a serial process (due to resource constraints)</th>
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<tr>
<td>• Leverage specialists to run multiple sourcing streams in parallel to optimize efficiency and deliver on deadlines</td>
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<tr>
<th>Flat-fee contracts</th>
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<tr>
<td>• Align incentives by putting some amount of contractor fees at risk</td>
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<th>Lack of ongoing auditing for compliance and performance</th>
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<td>• Conduct audits to ensure that the owner’s policies are adhered to and compliance requirements are met</td>
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<th>No proactive planning for deadline overages and ongoing change orders</th>
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<tr>
<td>• Expect success, but plan for hiccups</td>
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<tr>
<td>• Set labor rates and other terms to protect the owner and limit risk if timelines slip</td>
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<tr>
<td>• Minimize change orders by spending more time up front, and actively prepare to manage or negotiate change orders midstream when necessary</td>
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Source: Accenture.
Early collaboration

Early collaboration between engineering and procurement, linked to strategic planning discussions, can be one of the largest sources of potential savings and create the most value. At the foundation level, the teams can jointly define the optimal delivery model and downstream contract structures to govern the various pieces that make up the cost of work. The further the project progresses in its timeline, the less impact procurement can have in terms of driving savings as it becomes more reactive to in-process workstreams and deadlines. Proactively planning ahead to execute multiple parallel workstreams and follow a rigorous sourcing process will drive optimal savings. Early involvement of procurement helps:

- Identify available energy and government incentives and credits
- Proactively identify potential supply chain constraints and risks
- Define the best sourcing strategy (engineering, procurement and construction, EPCM, construction management or general contractor)
- Identify and source long lead-time equipment and services
- Prequalify suppliers
- Source and incentivize a design company to deliver quality results
- Provide realistic schedule requirements
- Develop more accurate budgetary information, vetted through a preliminary cost solicitation process

With the pressure to deliver, teams frequently want to jump right into projects, but extra time spent in planning can result in significant savings and improved delivery for the overall project.

Define division of labor

Companies cannot go it alone in major capital projects. However, there is a sliding scale of options ranging from a single EPCM company managing every aspect of the project to taking a more distributed, best-of-breed approach with specialists managing discrete portions of the project. While there are economies of scale and comfort in having one interaction point with a single EPCM managing the project, those benefits can quickly erode due to missed opportunities to leverage specialized procurement expertise in certain areas.

A major consideration is who should procure what. In the area of high-complexity, long lead-time items, the EPCM firm may not be best equipped to manage those streams, while in the area of low-complexity, more routine purchases, it can often be best to leverage the economies of scale from the EPCM provider.

The other benefit of spending time up front on carefully identifying and standardizing the different cost areas is that defining this initially can eliminate or reduce issues like the conflicts of interest that can arise from the same entity (such as the EPCM provider) establishing and then managing the budget. It also establishes a framework upfront to make procurement and finance audits of ongoing costs much clearer.

Best practices

- Leverage current market intelligence when selecting engineering/construction firms, and utilize best-practice contracting models around pricing, delivery, incentives, risk-sharing, and performance criteria. Holding contractors to clear expectations and putting at least some portion of fees at risk is important to align incentives. Upside bonuses can also motivate particular behavior and adherence to safety, schedule and cost requirements.

- Evaluate the pros and cons of using a single firm to provide both engineering and construction management services versus separating the two.

Manage construction costs

To manage construction costs effectively, it is critical to understand each of the major cost areas, sub-components, and drivers. Just as critical is to define a common taxonomy for each of the services/cost areas so that in the bid process, competing bids can be fairly compared on an apples-to-apples basis. The three major cost buckets are fee (the costs of engineering and construction management services), general conditions (indirect costs associated with the project such as supervision, safety costs and insurance), and cost of work (materials, equipment and labor for the project).

Cost of work makes up the largest portion of costs at around 80 percent of total project costs. It’s also the area where depth of current market intelligence and benchmarking can go a very long way to drive savings and protect against cost over-runs. For example, what are the correct benchmarks for labor rates for each work area?
Case Study:

Multimillion dollar plant expansion.

• Client lacked internal resources to manage project of this size.
• We helped the client source a construction management firm and general contractor.
• We identified major savings opportunities for 16 long lead-time equipment packages and ran several procurement streams in parallel.
• Each stream structured with the optimal pricing (e.g., cost, time and materials, and guaranteed max price), delivery (e.g., design-bid-build vs. design-build vs. multi-prime), contracting (e.g., shared savings and risk transfer) and performance criteria.

Result: Bottom line savings of more than 6 percent on a nine-figure project spend.

Source: Accenture.

The cost of work makes up about 80 percent of the total cost of a construction project. The balance is design and project management

![Cost Breakdown Diagram]

Source: Accenture.
Conclusion

Construction spending and new capital investment is finally on the rise after years of relative dormancy. It is time for companies to proactively prepare for upcoming capital projects with a holistic and integrated approach that links the strategic capital planning process with the engineering and procurement functions.

To learn more about how to apply the Blueprint for Large Capital Project Delivery to your company’s capital projects, contact us.

Source:

About Accenture

Accenture is a global management consulting, technology services and outsourcing company, with more than 293,000 people serving clients in more than 120 countries. Combining unparalleled experience, comprehensive capabilities across all industries and business functions, and extensive research on the world’s most successful companies, Accenture collaborates with clients to help them become highperformance businesses and governments. The company generated net revenues of US$28.6 billion for the fiscal year ended Aug. 31, 2013. Its home page is www.accenture.com.

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