

# PROJECT PORTFOLIO CAPITAL AT RISK AND THE ENTERPRISE PROJECT DELIVERY SYSTEM

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## Introduction

The impact of large, high risk capital projects in an energy firm's portfolio is frequently misunderstood and unappreciated. Often project delivery systems that were adequate for small or moderate size projects are totally inadequate for large projects that involve multi site international sourcing for engineering, material, fabrication and construction. Failure to recognize the mismatch and to upgrade the organization's project delivery system means that projects do not meet their business objectives such as: underperforming assets, late projects, and overrun budgets.

We present in this paper a methodology for evaluation of the project delivery system and its ability to support the firm's capital portfolio. Further we provide Capital at Risk models that notionally show a company's capital exposure for failure to upgrade the project delivery system.

## The Project Delivery System

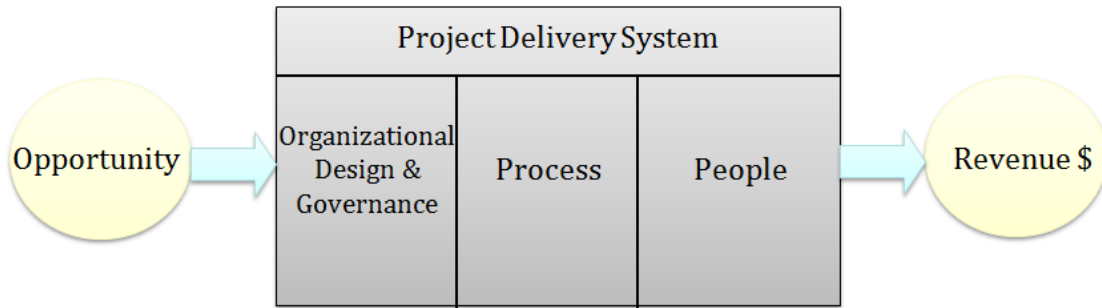
A Project Delivery System is the methodology that an organization utilizes to take a business opportunity from concept to startup. This is not to be confused with a phase gate process which is but one component of a Project Delivery System.

A project delivery system is composed of three major elements:

- ❖ Process – Are the work processes and procedures in place within the organization to support the planning and execution of the project?
- ❖ People – Who will perform the work, their skill set, their knowledge, and their availability to work on the project? Do we have enough people with the appropriate skill set on the project?
- ❖ Organizational Governance – Is there appropriate oversight and support for the project team to ensure that the project is planned and executed in accordance with the requisite processes and controls?

The monetization of an opportunity utilizing these three components of the Project Delivery System is depicted in the graphic below.

**Figure 1 Project Delivery System Components**



**Competencies**

A competency is defined as an observable behavior or utilization of a requisite skill set. Westney Consulting Group’s view is that there are twenty competencies that define the Project Delivery System. These twenty competencies are categorized into three major categories; strategic, tactical and performance management. The table below illustrates the three major categories and the associated competencies.

An organization must have these competencies to successfully plan and execute projects. Each of these competencies requires a business process, people with the requisite skills as well as executive organizational governance.

**Figure 2 Project Delivery System Competencies**

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|--|
| <p><b>Strategic</b></p> <ul style="list-style-type: none"> <li>• Partner Relationship Management</li> <li>• Local/Government Issues Management</li> <li>• Project Execution Planning</li> <li>• Scope Management</li> <li>• Value Improving Practice Implementation</li> <li>• Risk Management</li> <li>• Contracting Strategy</li> <li>• Team Alignment &amp; Effectiveness</li> <li>• Interface Management</li> <li>• Communication Management</li> </ul> <p><b>Tactical</b></p> <ul style="list-style-type: none"> <li>• Technology Management</li> <li>• Design Management</li> <li>• Procurement Management</li> <li>• Construction Management</li> <li>• Commissioning &amp; Startup</li> </ul> <p><b>Performance</b></p> <ul style="list-style-type: none"> <li>• Safety/Health/Environmental Management</li> <li>• Cost Management</li> <li>• Schedule Management</li> <li>• Quality Management</li> <li>• Operability Management</li> </ul> |
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Figure 3 shows the interaction between the three major Project Delivery System elements (Process, People, and Governance) and the three major competency categories (Strategic, Tactical, and Performance Management) where the twenty competencies reside.

**Figure 3 Project Delivery System Competency Model**

		CATEGORIES OF PDS ELEMENTS		
		I Governance and Organization Design	II Work Processes, Methodologies & Systems	III People (Skills, Availability, Effectiveness...)
CATEGORIES OF COMPETENCIES	A Strategic Management Functions	Business Controls and Organization Strategy	Business Practices and Management Methods	Staffing Strategy
	B Tactical Execution Functions	Alignment and Organizational Integration in Project Planning	Specific Execution Plans and Management	Providing Qualified and Experienced Personnel
	C Project Performance Functions	Budgeting, Decision Making and Controls	Tools for Tracking, Forecasting and Controlling Projects	Performance Capabilities required for Project Success

The organization’s Project Delivery System is evaluated at the intersection points. As an example, for Contracting Strategy:

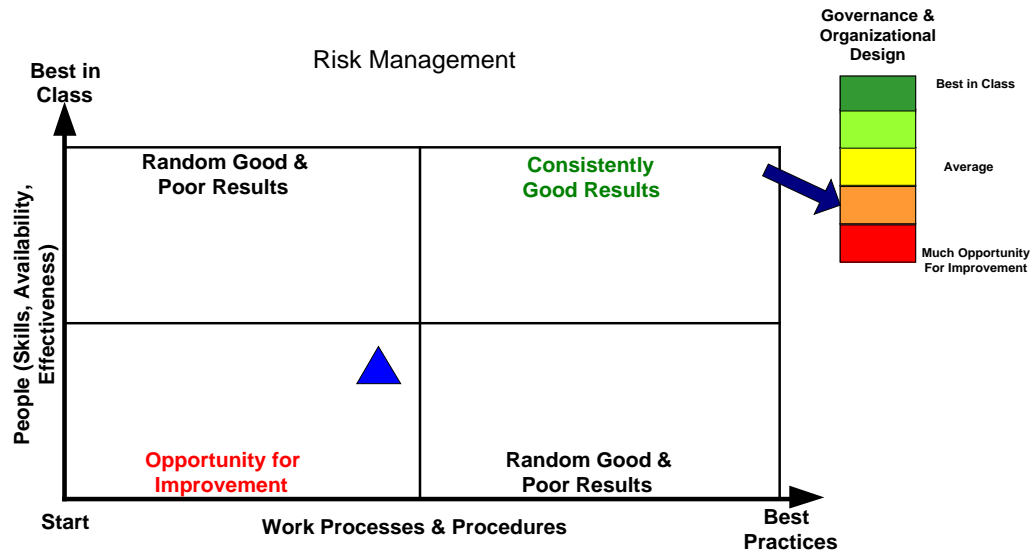
- ❖ Process – What are the processes in place to ensure a robust contracting strategy?
- ❖ People – Are there sufficient personnel with the appropriate skill set on the project team to develop a contracting strategy that supports the project objectives?
- ❖ Governance – Is there an existing executive oversight structure to ensure that people and processes are properly applied in planning and executing the project; and results are aligned with business objectives?

This same process is followed for the remaining nineteen competencies. From the analysis a series of findings are developed. The graphic below illustrates the typical results for a firm that is transitioning from executing small domestic projects, \$10MM - \$100MM, to a portfolio where the majority of the projects are international in scope and in the \$500MM - 1000MM++ range.

Note that the evaluation of an organization’s Project Delivery System is always done in the context of their project portfolio. A firm that can execute small U.S. based projects

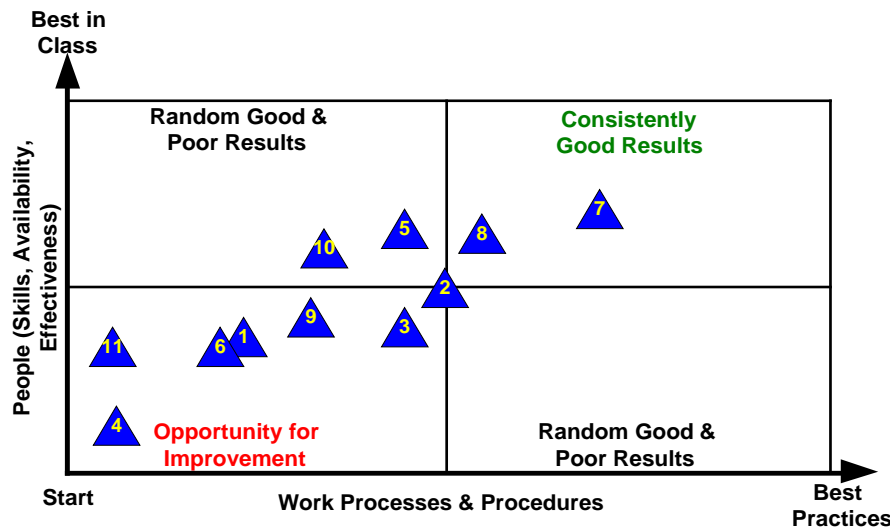
will not have the competencies to successfully deliver internationally focused megaprojects. Figure 4 illustrates the results for the risk management competency. Clearly the only way the organization will deliver projects consistently is by having strong processes and personnel with the right skill with a strong governance structure.

**Figure 4 Sample Risk Management Competency Evaluation**



This process is followed for all of the rest of the competencies and a picture emerges as to the ability of the firm to support the project portfolio.

**Figure 5 Notional Firm - Project Delivery System Competency Evaluation**



Based on the findings a 1 to 5 rating is assigned based on the capability of the firm's Project Delivery System to support the project portfolio: One being the lowest and five the highest.

## Portfolio Analysis

As previously discussed, the Project Delivery System must be sufficiently robust to support the portfolio and minimize risks. The next step is to categorize each opportunity in the portfolio. Through a proprietary methodology utilizing various criteria a rating of I to V is assigned to each project. A Type I project is the least challenging and a Type V the most challenging. Figure 6 is an example of portfolio categories developed for a medium size energy company with both domestic and international projects. The descriptions must be adjusted to match each firm's portfolio.

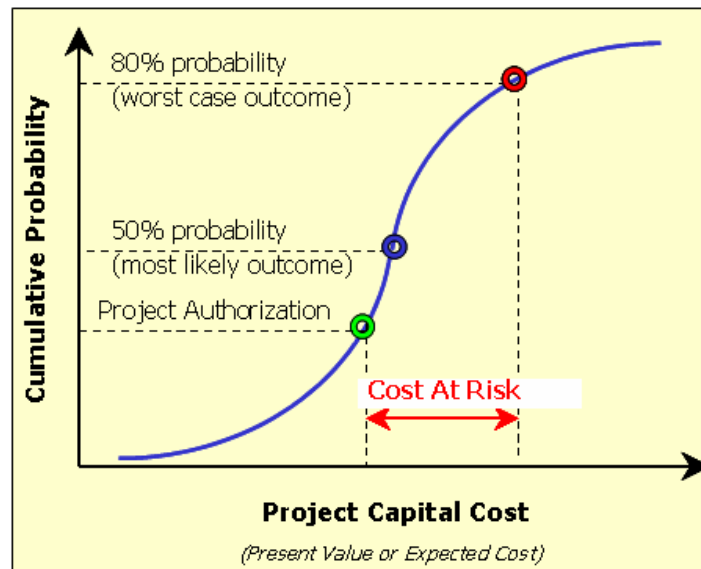
**Figure 6 Project Portfolio Categorization**

Project Type	Risk	Description
<b>Type I</b>	<b>Low Risk</b>	CAPEX less than \$5MM, very simple scope, very mature technology, and client is a U.S. based long time partner.
<b>Type II</b>	<b>Some Risk</b>	CAPEX \$5MM to \$10MM, scope is well understood, international installation, well known technology, and there is some experience with the non U.S. based client.
<b>Type III</b>	<b>Moderate Risk</b>	CAPEX is \$10MM to \$50MM, scope is an integrated unit, some work is to be done internationally, have some experience with the technology.
<b>Type IV</b>	<b>High Risk</b>	CAPEX is \$50MM to \$200MM, scope includes multiple integrated units, engineering and construction will be done internationally, and firm has limited knowledge the technology.
<b>Type V</b>	<b>Highest Risk</b>	CAPEX is greater than \$200MM, scope includes multiple integrated units, engineering and construction will be done internationally, and firm has never used the technology. Owner has a challenging construction schedule.

## Capital at Risk (CaR)

Capital at Risk, or Cost at Risk (CaR), is defined as the difference between the worst case outcome for project cost and the project authorization amount. The worst case amount is usually defined as a P80 value or a value that has an 80% probability of not being exceeded. Based on Westney Consulting Group's experience, a project authorization value is typically less than P50, which means that the project has higher than a 50% probability of exceeding the authorized amount. The figure below illustrates the concept of CaR:

**Figure 7 Project Capital at Risk**



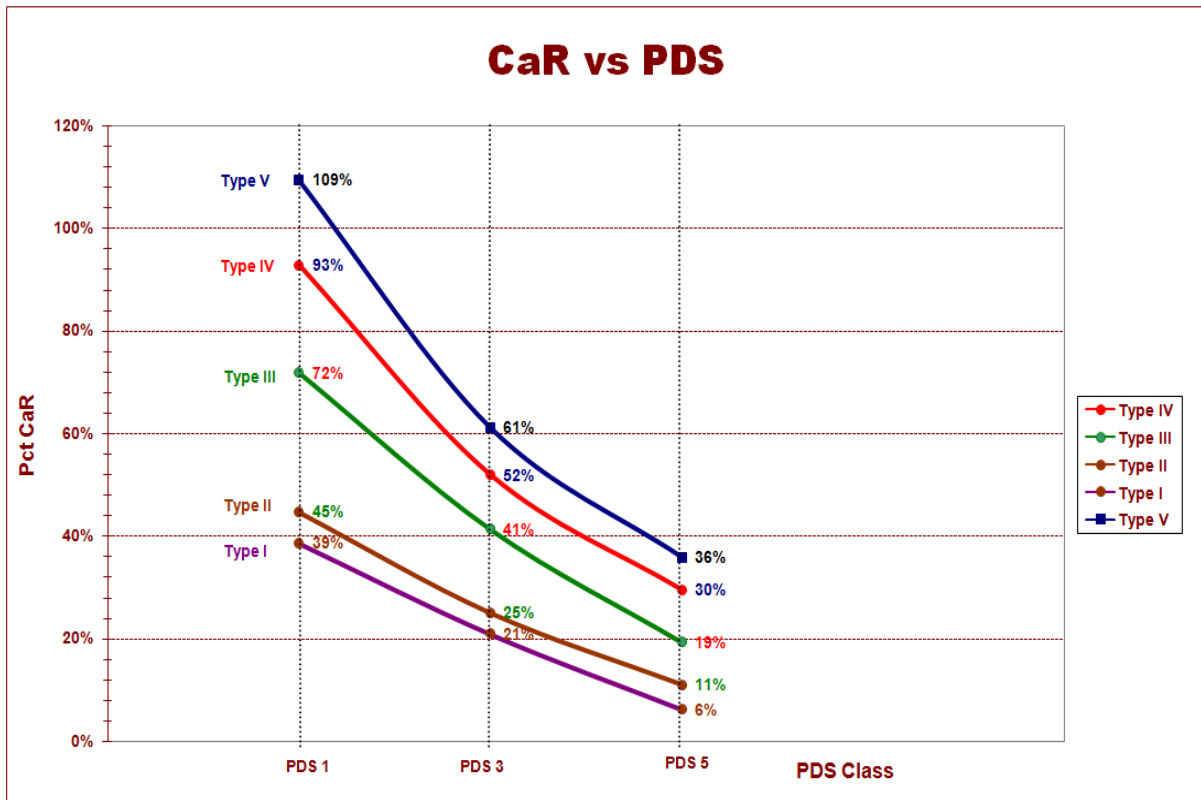
For a given Project Delivery System rating, the more complex the project (a Type V versus a Type I) the higher the Capital at Risk will be for the firm. Alternately, for a given organization's portfolio, the lower its Project Delivery System rating, the higher its Capital at Risk.

Higher Capital at Risk translates into cost overruns, schedule delays, poor asset performance, etc. This concept is demonstrated in the Figure 8. The vertical axis is a plot of the percent Capital at Risk of the base capital cost estimate. The horizontal axis is the Project Delivery System rating of the organization.

This notional firm depicted in Figure 8 has a PDS ranking of 1. The majority of its portfolio is relatively simple Type 1 projects. However, the firm has several more complex Type III and Type IV projects. Failure to upgrade its Project Delivery System will mean that a substantial portion of its capital will be at risk as the increasing percentage of the CaR is applied against an ever increasing capital project cost!

However, if the firm can transition to a PDS ranking of 3 it will be able to execute more complex, higher capital, and presumably higher ROI projects without an unmanageable Capital at Risk.

**Figure 8 Capital at Risk versus the Project Delivery System**



## Conclusion

As organizations strive to execute larger projects in a challenging environment they must upgrade their Project Delivery System to meet the increasing project complexity. Failure to do so means the firm puts substantial Capital at Risk as is demonstrated by project schedule delays, cost over runs, poor asset performance, etc.

What we have discussed in this paper is a methodology to a

- ❖ Assess the current state of a firm's Project Delivery System based on a set of twenty competencies
- ❖ Analyze and categorize the complexity of the project portfolio
- ❖ Determine notionally the organization's Capital at Risk based on the existing Project Delivery System in its project portfolio.

## Authors

*At Westney Consulting Group Pete Luan works with business unit leaders, CEO's and COO's to ensure that capital projects meet their business goals. A former officer in the US Army, he gained extensive experience managing large capital projects for BP Amoco in the Middle East and Latin America. He has held management positions with several management consulting firms and is a certified Project Management Professional. He holds BS and MS degrees in Mechanical Engineering (with high honors) from Rice University and is a graduate of Harvard Business School Executive Education program.*

*John Wray is Vice – President and a Senior Executive Consultant with Westney Consulting Group. He specializes in project management best practices including lessons learned and team alignment. John held various senior management positions with DuPont, focusing on engineering, plant operations and maintenance, and project management. He holds a BS in Electrical Engineering from the University of Texas and is certified as a Project Management Professional as well as a Myers Briggs consultant.*