

Calibrating the Predictability of Major Projects

*Using Predictability Calibration™ to Guide
Capital Investment Decisions*

January 2011

Today's executives face major challenges when confronting the opportunities and risks associated with multi-billion dollar investments in major projects. Many have become skeptical that the proposed project's final outcome will be anything like the cost estimate or schedule being presented to them. This skepticism is justified; research on hundreds of major projects confirms current methods of cost and schedule evaluation are consistently incorrect. This issue is particularly compelling in the current economic environment, in which management must be confident a project will produce an acceptable return on investment and not represent lost opportunity.

Above all, decision-makers need a good understanding of the factors affecting a project's *predictability*. Unfortunately, this is something they seldom have. The restrictions of conventional analyses combined with the inherent optimism of project developers and teams most often results in important risk factors being ignored or undervalued in most project investment decisions.

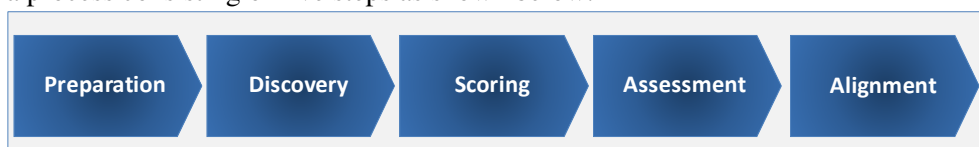
Predictability Calibration™ takes a different approach. *It gives decision-makers an unbiased view of the predictability of any project at any stage.* Thirty-five Predictability Factors are assessed through document reviews and interviews; they consider every aspect of a project, including critical factors that are not usually addressed. Typically requiring only a week, Predictability Calibration™ provides executives with an easy-to-use, actionable metric of a project's predictability including scoring, key findings, and the appropriate level of confidence in the cost and schedule.

An important advantage of Predictability Calibration™ over conventional practice is that it does not rely on normalized data from past projects to infer the predictability of the project at hand. The use of data from past projects can be misleading since it assumes that the project at hand is essentially similar to the average project in the database. Of course, this is seldom the case; teams, technologies, regulations, locations, and market conditions change in significant ways. Many "best practices" rely in some way on historical data and average performance; for example, the predictability of cost and time estimates is often inferred by:

- The estimate classification systems used in a typical stage-gate process (e.g., "We are at Gate 2, so our estimate accuracy is plus 25 % minus 15 %"). These estimate classifications are primarily based on degree of design definition and do not consider many of the non-technical risks and performance factors that drive outcomes.
- Benchmarking against a database of past projects, most of which were executed by other operators under different conditions.
- Scope and design definition work, based on analogous designs for similar projects. This can create the illusion that the design definition is greater than it really is.

While all these practices can be helpful, they view a project relative to past projects and so are unable to reflect all the factors that determine the predictability of the project at hand and the environment under which engineering and construction will take place. A true measure of predictability requires an absolute view in which the project is seen in terms of its own circumstances.

Westney's Predictability Calibration™ process is an independent and unbiased, expert perspective that uses a process consisting of five steps as shown below:



The first step is **Preparation**. Westney assigns a team of two consultants, each of whom has decades of each of whom has decades of capital project experience with owner and/or E&C contractor

organizations. Preparation activities are focused on reviewing project documentation and setting up the interviews with key knowledge holders.

- Document Reviews** include:
- Basis of Design
 - Flow sheets, plot plans, and other design documents
 - Commercial Agreements
 - Engineering, Procurement, Construction Agreements
 - Project Financing Plan and Agreements
 - Joint Operating Agreement
 - Project Execution Plan
 - Project Cost Estimate and Schedule
- Interviews** are planned with key knowledge holders including:
- Finance and Commercial Managers
 - Reservoir and Drilling Managers (offshore projects)
 - Engineering Managers and Leads
 - Project Director and Managers
 - HSE Managers
 - Planners and Cost Estimators
 - Construction and Startup Managers

The documentation and interviews provide the information needed to score each of the 35 Predictability Factors that cover *every* aspect of the project including commercial, financial, technical, and execution. Preparation activities usually take place part-time over a week or two. It is critical that interviews be scheduled so that all knowledge-holders are available in a 3-day period to minimize time and cost. Note that key knowledge holders may be part of the owner, partner, contractor, or lender

organizations.

The second step is **Discovery**. This occurs over days 1 – 3 of the one-week on-site Predictability Calibration™ process. After an initial kickoff meeting to ensure everyone understands what is being

done and why, Westney’s consultants conduct individual interviews with key knowledge-holders (typically about 15-25). Each interview covers the Predictability Factors for which that person has an informed view. Calibration guidelines are used to ensure consistency and objectivity. Since each Factor has about 10

- Interview Process:**
- Knowledge-holders interviewed individually
 - Two Westney consultants (typically with owner & contractor backgrounds)
 - Structured Interview Process to ensure consistency
 - Focus on the relevant Predictability Factors

focus areas, the Discovery process actually considers hundreds of predictability drivers. A spreadsheet-based Discovery tool is used to capture the notes and detailed findings of each interview. All interviews are kept confidential.

The third step is **Scoring**. Scores are then developed for each Predictability Factor, based on a pre-defined yardstick in which a score of “5” represents the highest possible degree of predictability. A detailed list of findings that support the scoring is also provided.

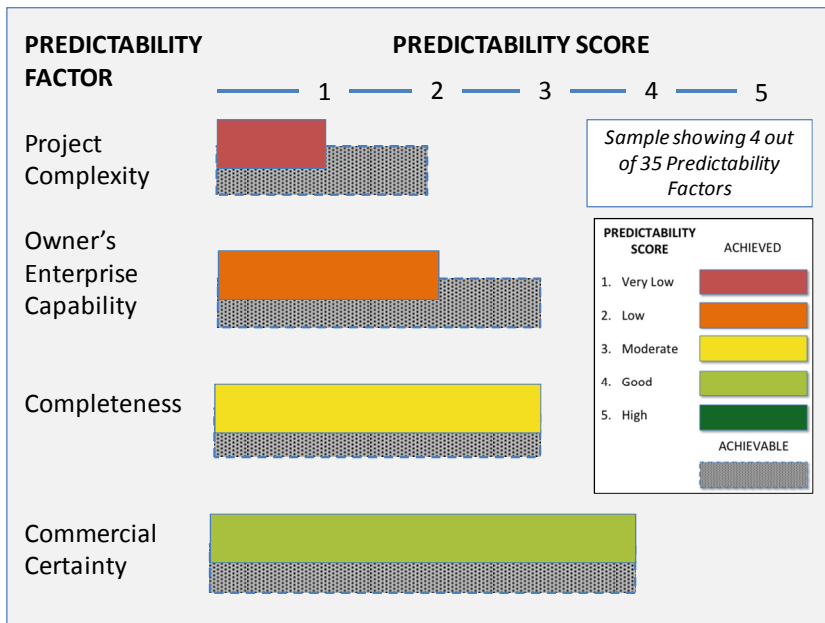
- Scoring Process** for each Predictability Factor
- Scores range from 1 to 5 (lowest to highest predictability)
 - Standard set of scoring criteria to ensure objectivity
 - Each Predictability Factor is given two scores:
 - ACHIEVED: the project’s score
 - ACHIEVABLE: the best possible score for this project at this point in the project life-cycle
 - Detailed Findings documented

The Westney consultants score each predictability factor twice: the first is the predictability ACHIEVED; this is where the project is today. The second is the ACHIEVABLE predictability; this is realistically what the project *could* achieve today. The scoring is done for each of the 35 Predictability Factors which are shown below.

Commercial Certainty	Country/Political	Safety Culture	Contracting Strategy
Completeness	Country/Taxation	Environmental Commitment	Execution Planning/Execution
Definition	Social/Community	Contractor's Enterprise Capability	Economic and Commodities
Definition Commitment	Site - Physical	Contractor's Team Competency	Market Demand - E&C Management
Technical Maturity	Site - Labor Availability	Project Cost Estimate Quality	Market Demand - Fab. & Manuf.
Facility Performance	Financial Stakeholders	Budget Commitment	Market Demand - Construction
Project Complexity	Interfaces - Difficulty	Completion Date Estimate Quality	Commissioning & Startup Assurance
Project Size	Owner's Enterprise Capability	Completion Date Commitment	Operations Planning
Business Agreements	Owner's Team Competency	Unrecognized Weather	

The fourth step is **Assessment**. This occurs on the fourth day. The Westney team consolidates the findings from each interview and scores for each Predictability Factor into a comprehensive assessment of the project. It is important that the calibration results meet two standards: they provide management and project leaders with a *clear and complete view* of predictability, and they *frame key issues* for management attention.

This chart illustrates how the scoring for each Predictability Factor is presented. A color code indicates the score achieved, and the shaded bar indicates what is achievable. The difference



between the two scores clearly indicates areas, such as Owner's Enterprise Capability, in which issues exist and additional work is required.

It is also important to note that there may well be Factors for which the desired level of predictability cannot be reached. For example, while work can be done to improve the score for Project Complexity, it is clear that the project's complexity presents a

level of uncertainty that, even if addressed completely, will still only reach a score of "2", well below the level of predictability of the other Factors.

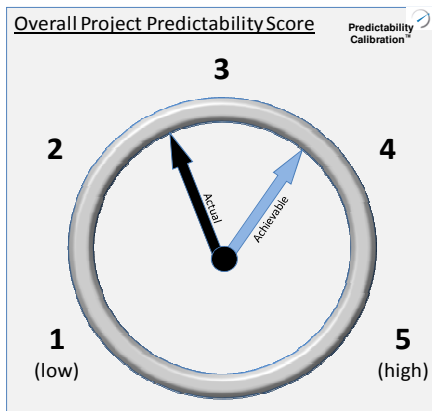
The Key Findings for each Predictability Factor provide background on the scoring and frame the key issues. For example, the Key Findings associated with Project Complexity for a recent mega-project are illustrated here.

Key Findings: Project Complexity

- The overall project includes a mine, process plant, power plant and port, all at different locations
- The process plant comprises 12 different units to be served by common utilities, and access is limited by a narrow site
- There are 5 sequential processing steps with different unit operations and numerous recycle streams

With this knowledge of how Project Complexity impacts predictability, management can make decisions with full awareness of the uncertainties involved.

The fifth and last step is **Alignment**. This occurs on the fifth day and consists of project team and executive briefings in which a short slide deck is presented. The goal is to ensure alignment on the project’s current drivers of predictability and on the path forward.



The presentation will discuss the key findings and critical issues that have been identified, the project’s overall level of predictability, and how each Predictability Factor was scored. The detailed scores and findings are summarized into an overall score (as indicated by the Predictability Gauge illustrated here), as well as Key Findings that describe those areas in which predictability can be improved, and how to improve them. Key Findings also identifies those Factors for

which a level of unpredictability must be accepted and continuously managed.

Summary

Applicable to any project at any time, Predictability Calibration™ gives executives and project leaders an unbiased perspective on the specific issues they face.

Westney's expert consulting staff and Predictability Calibration™ process require only a week to develop a rigorous assessment that pinpoints what management needs to know to de-risk the project, improve predictability, and gain the confidence needed to move forward.

About Westney Consulting Group, Inc.

Founded in 1978, Westney Consulting Group is internationally recognized for thought leadership in the risk management, strategic planning, and organizational effectiveness of large, complex engineering and construction projects. Based in Houston, Texas, the company advises owner/operator, developer, and financial executives in the energy, chemicals, mining & minerals industries.

For more information visit our website at www.westney.com or call us at 713-861-0800.