

WHITE PAPER

Introduction to the Project Definition Rating Index (PDRI)



Table of Contents

Introduction	3
What is the Project Definition Rating Index?	3
Why is PDRI Critical?	3
Who uses PDRI?	3
PDRI Methodology	4
Structure	4
When to use PDRI	4
Assessment Process	5
Scoring	5
PDRI Templates	6
Industrial Projects	6
Building Projects	6
Infrastructure Projects	6
Project-Level Benefits	7
Improved Cost & Schedule Performance	7
Increased Team Alignment	7
Transparency	7
Portfolio-Level Benefits	8
Risk Monitoring & Classification	8
Continuous Improvement	8
Getting Started	9
Needs Analysis	9
Preparing for Change	9
Initiating a Pilot	9
Growing the Implementation	9
References	10

Introduction

What is the Project Definition Rating Index (PDRI)?

The Project Definition Rating Index (PDRI) is a methodology used by capital projects to measure the degree of scope definition, identify gaps, and take appropriate actions to reduce risk during front end planning. PDRI is used at multiple stages in the front end planning process. As a project progresses, identified gaps will continue to be addressed until a sufficient level of definition (measured using the PDRI score) is achieved for the project to successfully proceed to detailed design and construction.

Why is PDRI Critical?

Poor scope definition is recognized as one of the leading causes of project failure, resulting in cost and schedule overruns, and long term operational issues. As a result, front end planning is one of the most important processes in the construction and operation of a capital asset. The PDRI methodology is proven to reduce risk in capital project delivery by promoting rigorous scope definition and a collaborative review process during front end planning.

Using the PDRI methodology will help your project teams improve scope definition, become better aligned, and provide transparency on identified gaps. This helps to equip all project stakeholders to better mitigate risks identified in PDRI reviews, predict potential issues, and prevent costly problems down the road.

Who uses PDRI?

Owners with large capital expenditures in construction-related projects are the leading users of PDRI. The Construction Industry Institute (CII) has benchmarked over \$96 billion in capital projects⁽¹⁾, showing up to:

25% Cost Savings
17% Schedule Reduction

Engineering firms and contractors also use PDRI. It is used as an alignment tool in the development of an Owner's business objectives, to clarify requirements, improve cost and schedule estimates, and coordinate execution planning. Contractors also use PDRI to assist in risk assessment for a Request for Proposal (RFP) on a project where scope definition has been completed by the Owner or another engineering firm.

PDRI Methodology

Origin of PDRI

The Construction Industry Institute (CII) recognizes front end planning as the single biggest factor in controlling cost and schedule overruns in capital projects. Over 20 years of research and development stands behind the Project Definition Rating Index (PDRI) methodology. It is CII's most widely used tool by both Owner and Contractor members.

Structure

The PDRI methodology supports a comprehensive assessment of scope definition. Templates are organized in three sections for systematic assessment of the:

- Basis of project decision – the business objectives and drivers
- Basis of design - processes and technical information required
- Execution approach - for executing the project construction and closeout

Each section is broken down into categories and elements. The element is the lowest level of the index where the assessment of scope definition is conducted.

When to use PDRI

PDRI can be used at multiple points during front end planning, and normally coincides with the completion of a stage (Figure 1). Organizations that adopt PDRI as part of their project governance normally require a minimum of two PDRI sessions.

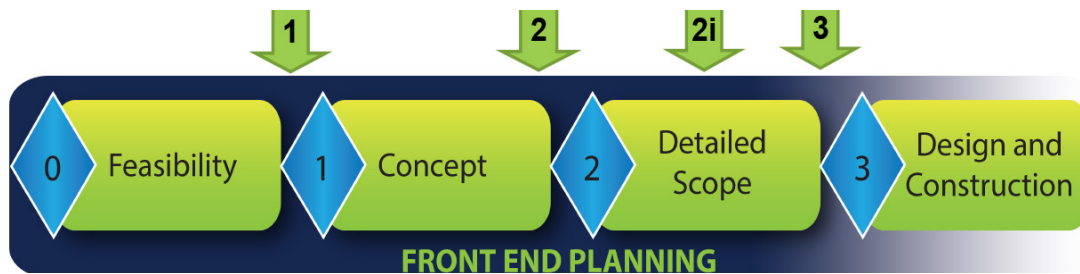


Figure 1. PDRI Application Points

Early Review

Conducting a PDRI early in front end planning (e.g. PDRI-2, end of concept stage) helps project teams in:

- early team alignment on project objectives
- identifying high priority project deliverables
- helping to eliminate late surprises in planning

Final Review

A PDRI-3 session should be conducted for all projects. The results are a key input for project sanctioning or authorization for expenditure (AFE) decisions. The final review session provides a:

- PDRI total score that indicates the level of scope definition (target is less than 200)
- list of low definition elements that remain to be addressed
- action items identified by the team to be addressed



Assessment Process

A PDRI session is a facilitator-led meeting that is conducted with all key project stakeholders. For each element, the facilitator introduces the element requirements and leads the group in objectively:

- discussing their progress on definition,
- identifying gaps and action items,
- assigning their current definition level

A co-facilitator (scribe) captures the element definition level and documents the gaps and action items identified during the group discussion.

Open Industry Standard

PDRI templates were developed by three CII research teams with representation from 49 member organizations. The templates were vetted and weighted by 187 industry professionals, representing 102 organizations. CII estimates over 4,000 years of industry experience stand behind today's PDRI templates.

Scoring

Each element is assigned a definition level between 1 (completely defined) to 5 (undefined). Elements that are not applicable are scored 0 and excluded from the total calculation. Each element's definition level corresponds to a score based on its relative risk to project performance. The rollup of all element scores provides a PDRI total score between 70 to 1,000 points.

PDRI total score will decrease as scope definition increases during front end planning of a project. CII recommends projects proceeding to detailed design and execution achieve a PDRI-3 score of less than 200⁽²⁾ for optimal cost and schedule performance (Figure 2).

Typical	PDRI-1	PDRI-2	PDRI-2i	PDRI-3
Min	550	450	300	150
Max	800	600	450	250
Target Score < 200				

Figure 2. PDRI Score Ranges by Front End Planning Stage

PDRI Templates

Greenfield & Brownfield Considerations

All PDRI templates include specific risk factors related to new construction (greenfield) and renovation and revamp (brownfield) projects.

Specific renovation and revamp issues are highlighted within each element description to ensure project teams specifically address these critical issues during a PDRI session.

There are three industry-validated PDRI templates that each focus on a specific industry sector.

Industrial Projects

The Industrial template is targeted for projects that provide an output in terms of assemblies, sub-assemblies, chemical compounds, electricity, food or other marketable goods. Examples include power plants, chemical plants, oil & gas production, refineries, water, waste treatment, and manufacturing facilities.

Building Projects

The Building template is designed for commercial building projects. Examples including offices, schools, medical facilities, institutional buildings, warehouses, parking structures and research facilities.

Infrastructure Projects

The Infrastructure template is targeted for projects that involve linear construction with extensive public interface and environmental impact considerations. Examples include railways, highways, pipelines, transmission and distribution and canals.

Characteristic	Industrial	Building	Infrastructure
Primary Designer	Process Engineer	Architect	Civil Engineer
Interface with Public	Minimal	Moderate	Extensive
Primary Cost	Piping & mechanical equipment	Building & related systems	Earthwork, structures, materials
Installed Equipment Cost	Extensive	Moderate	Minimal
Land Cost	Low to moderate	Variable	Moderate - high

Figure 3. Project characteristics to consider when selecting a PDRI template ⁽²⁾

Project-Level Benefits



Using PDRI to assess your project team’s progress on scope definition helps identify gaps and mitigate risks that can be addressed during front end planning, before detailed design begins. Project teams realize many benefits.

Improved Cost & Schedule Performance

Over \$96 billion ⁽¹⁾ in capital projects have been benchmarked by CII, showing cost savings of up to 25% and schedule reductions of up to 17% (Figure 4).

PDRI Score	Cost Performance to Budget		Schedule Performance to Plan	
	< 200	> 200	< 200	> 200
Industrial (n=128)	4% below	4% over	4% behind	10% behind
Building (n=108)	3% above	9% above	5% behind	21% behind
Infrastructure (n=22)	5% below	25% above	13% behind	30% behind

Figure 4. PDRI impact on front end planning project performance for each PDRI template

Increased Team Alignment

The facilitated project review promotes alignment between everyone on your project team – regardless of whether you represent the Owner, a consultant, or a design contractor. The assessment process promotes open communication and allows the project team to objectively recognize poorly defined element and identify action items.

Transparency

The PDRI process provides an ideal opportunity to clearly communicate project risks and action items to all stakeholders groups. PDRI results ensure everyone knows their responsibility and the actions necessary to achieve the desired level of scope definition in front end planning.

Portfolio-Level Benefits

PDRI is a proven tool to help your portfolio managers gain insight into risk for projects in front end planning. With systematic data collection in place, portfolio managers can start to derive significant value by benchmarking front end planning key measures.

Risk Monitoring & Classification

PDRI scores are used to monitor portfolio-level risk in front end planning by comparing PDRI scores to target ranges for each stage gate. Higher-risk projects (Figure 5) are easily identified and allow Portfolio managers to proactively monitor risk responses on projects that fall below the portfolio's target level of scope definition at project authorization.

Continuous Improvement

When PDRI assessments are conducted consistently across a portfolio, the process provides a comprehensive review of front end planning performance. PDRI data is used in continuous improvement efforts to identify portfolio weaknesses posing the greatest risk to project execution.

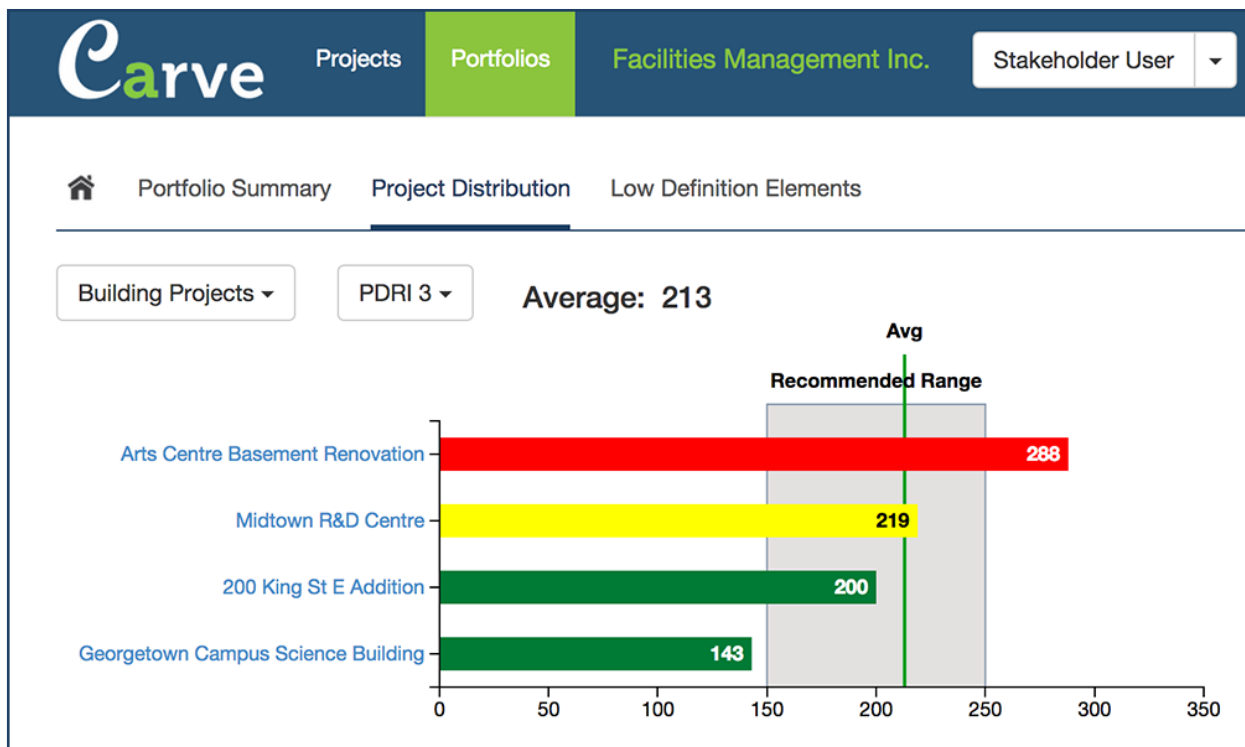


Figure 5. Use PDRI to identify higher-risk projects proceeding to execution

Getting Started

The greatest challenge to introducing change in project management practices is developing an implementation plan that provides enough detail so that everyone understands the roadmap to success. CII's implementation planning model ⁽³⁾ is an ideal way to develop your PDRI implementation plan and get your organization started with PDRI.



Needs Analysis & Management Buy-in

The best place to start in building a business case for adoption of PDRI is to evaluate your specific organizational needs. Consider performing a self-assessment on your organization's level of maturity in front end planning best practices. A well prepared business case is key to obtaining management buy-in for implementation of PDRI.

Preparing for Change

It is important to consider the organizational impact that PDRI will have, and identify potential change areas. Educational courses on PDRI offered by CII Registered Education Providers are a great way to leverage lessons learned from others and incorporate these potential change areas in your implementation plan.

Initiating a Pilot

Every successful PDRI implementation starts with a limited-use pilot. Select a small number of strategic projects that:

- represent the main types of projects in your capital program
- range in project size and current stage in front end planning (e.g. early review, final review)
- offer an opportunity to build a solid success story

Consider engaging an external Certified PDRI facilitator for your pilot. The quality of your facilitator may be the most important success factor for your pilot. Finally, develop a strong communications plan. Selling the vision is critical to getting project stakeholders on board and attaining the success stories you'll need to move to the next step.

Growing the Implementation

The next step is to develop and execute a plan for growth that includes a larger number of projects, groups or divisions. Key strategies to consider as you grow your PDRI implementation include:

- developing a growth-phase communications plan,
- identifying local implementation champions,
- selecting a system that makes PDRI engaging for all project stakeholders, and
- building a training plan for PDRI facilitators, project leaders, risk/cost/schedule experts and project team members.

References

1. "Assessment of Effective Front End Planning Processes," Research Summary 268-1a, Construction Industry Institute, 2013.
2. "Development of the Project Definition Rating Index (PDRI) for Infrastructure Projects," Research Report 268-11, Construction Industry Institute, 2011.
3. "The Implementation Planning Model: Steps to Success," Implementation Resources 246-2, Construction Industry Institute, 2009.

About Valency

Valency is a provider of project readiness solutions to reduce risk for organizations managing a large portfolio of capital projects. We are a Registered Education Provider (REP) with the Construction Industry Institute (CII), specializing in front end planning, portfolio management, risk management and team alignment.

We offer a wide range of capabilities to assist organizations in getting the most out of their implementation of the Project Definition Rating Index (PDRI). Our solution offering includes:



Carve for PDRI

An application that simplifies PDRI implementation and makes PDRI engaging for all project stakeholders.

Third-party Facilitation Services

Our team of Certified PDRI facilitators are veterans in industrial, building and infrastructure projects.

Training Courses

Educational modules including PDRI principles & practices, implementation best practices and facilitation training.

Applied Analytics Services

Data analysis to identify influential factors and performance impact of PDRI for your organization.



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