

Understanding and Assessing Project Complexity

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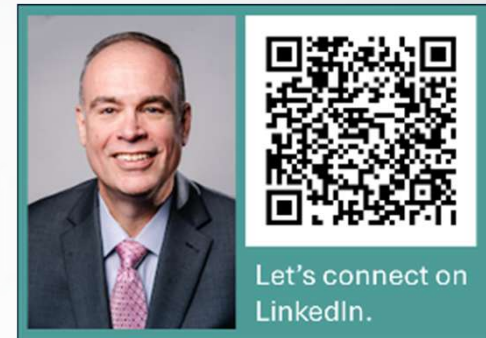
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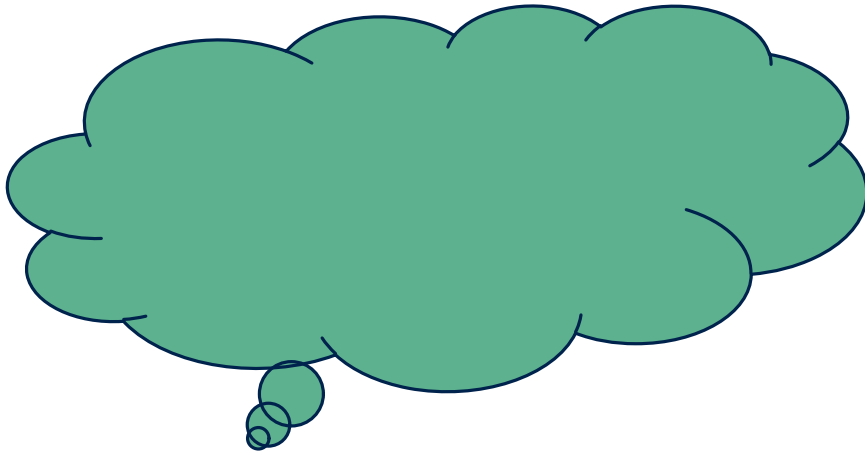
Dr. Leon Herszon, PhD, PMP, CSM, CSPO, DASSM

- Began career at Shell (Engineering, Health Safety & Environment, IT, Strategic Projects).
- Held roles in several organizations, including Global Business Development, CIO, COO, CAO (Chief Agility Officer), and Head of Consulting.
- Currently CEO & President of **Value Edge Group**.
- **Experience** in leading organizational transformations, fostering innovation, and facilitating change.
- Author of the book “***The Strategic Project Manager's Guide to Complex Projects***” (Wiley, 2026)
- Adjunct Professor at **Rutgers Business School**.
- Keynote speaker and Host of the podcast “***Insights with Dr. Leon Herszon***”.
- Frequently writes **papers and articles** on Project Management, Complexity, Agile, Leadership, and Artificial Intelligence.
- Several times **Ironman** triathlon finisher.
- **Communicates** in French, German, Portuguese, English, and Spanish.



Poll #1

Type the first word that comes to your mind when someone says “COMPLEX”



Agenda



Learn the Distinction

Differentiate between complex and complicated projects through clear definitional frameworks.

Discover Dimensions

Explore **15 research-validated dimensions** of project complexity based on literature review and analysis of complex projects.

Impact and Recommendations

Identify the impact on estimation and portfolios.
Receive recommendations for managing complexity and addressing common objections.

Apply the Tool

See a **live demonstration** of a free online assessment tool that quickly evaluates your project's complexity profile.

Poll #2

Is there a difference between Complex and Complicated?

- A. No, they are the same
- B. Yes, but I am not sure about the difference
- C. Yes, and I know the difference



Do not register
Skip for Now

Complexity Definition

Complexity is a dynamic state that has an unknown outcome and an increased level of difficulty since one does not know if or how each part affects or is affected by the other(s).

— L. Herszon, 2017

The Strategic Project Manager's Guide to **Complex Projects**

Understanding, Navigating, and
Simplifying Project Complexity

Dr. Leon Herszon

WILEY

Why Project Complexity Matters

Historical Cost Overruns in Complex Projects

770%

London Olympics

Initial estimate: £2.3B

Final cost: ~£15-20B

390%

Boston Big Dig

Original 1998: \$2.8B

Final 2007: \$13.8B

580%

ObamaCare Website

Original 2010: \$93M

Delivered 2013: \$634M

180%

Shell Sakhalin II

Original: \$10B

Final estimate: \$28B

Traditional project management approaches **fail to account for complexity dimensions**, leading to systematic underestimation of costs and overestimation of benefits.

The Reality of Modern Projects



Limited Scope Management

Traditional methods track what's in scope but often miss interactions between elements

Static Risk Registers

Point-in-time assessments fail to capture emergent risks from complex interactions

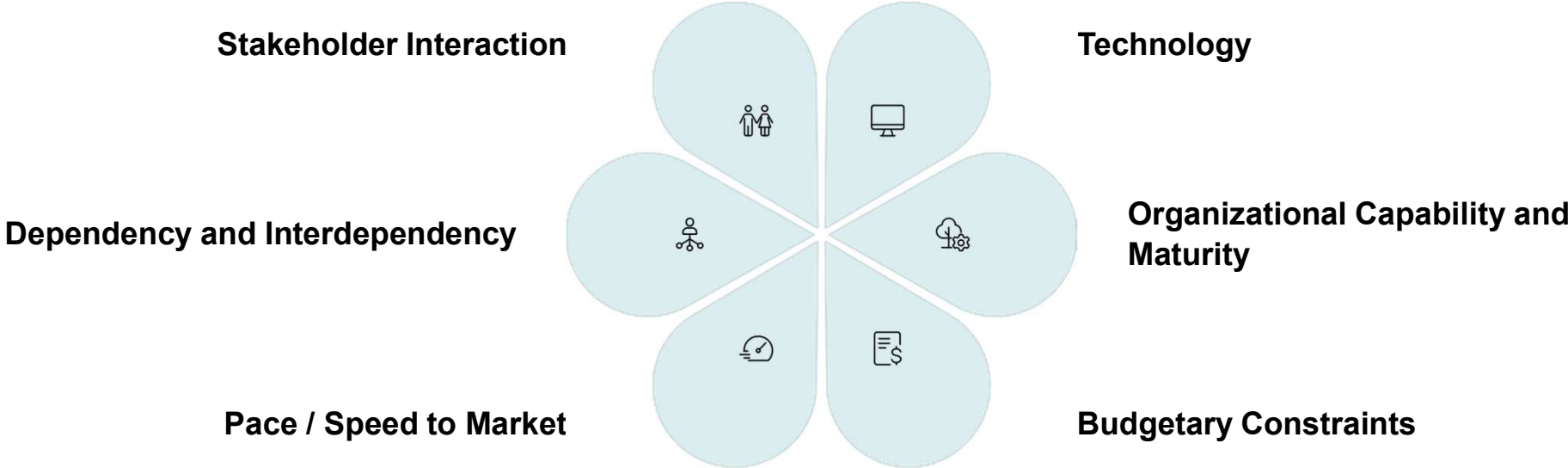
Inadequate Stakeholder Analysis

Complexity arises from stakeholder networks that standard matrices don't capture

Your project toolbox needs an upgrade to handle today's complex environments.

Introducing the 15 Dimensions of Project Complexity

Based on extensive academic research and practitioner experience



The 15 Complexity Dimensions

1. Budgetary Constraints
2. Clarity of Goals
3. Communication Quality
4. Degree of Trust
5. Dependency and Interdependency
6. Knowledge and Experience
7. Organization Capability and Maturity
8. Pace / Speed to Market
9. Political Influence (Politics)
10. Product and Project Size
11. Risks
12. Stakeholder Interaction
13. Technology
14. Time Frame
15. Uncertainty

Dimension Spotlight: Clarity of Goals



What it measures:

- Specificity of project objectives
- Alignment between stakeholders on goals
- Stability of requirements over time
- Measurability of success criteria
- Presence of conflicting objectives

Why it matters:

Unclear goals create a moving target — teams expend effort on deliverables that don't align with actual needs, leading to rework, scope creep, and stakeholder dissatisfaction.

Score ranges from 1 (crystal-clear, stable goals) to 4 (vague, shifting, or conflicting objectives)

Dimension Spotlight: Dependency & Interdependency

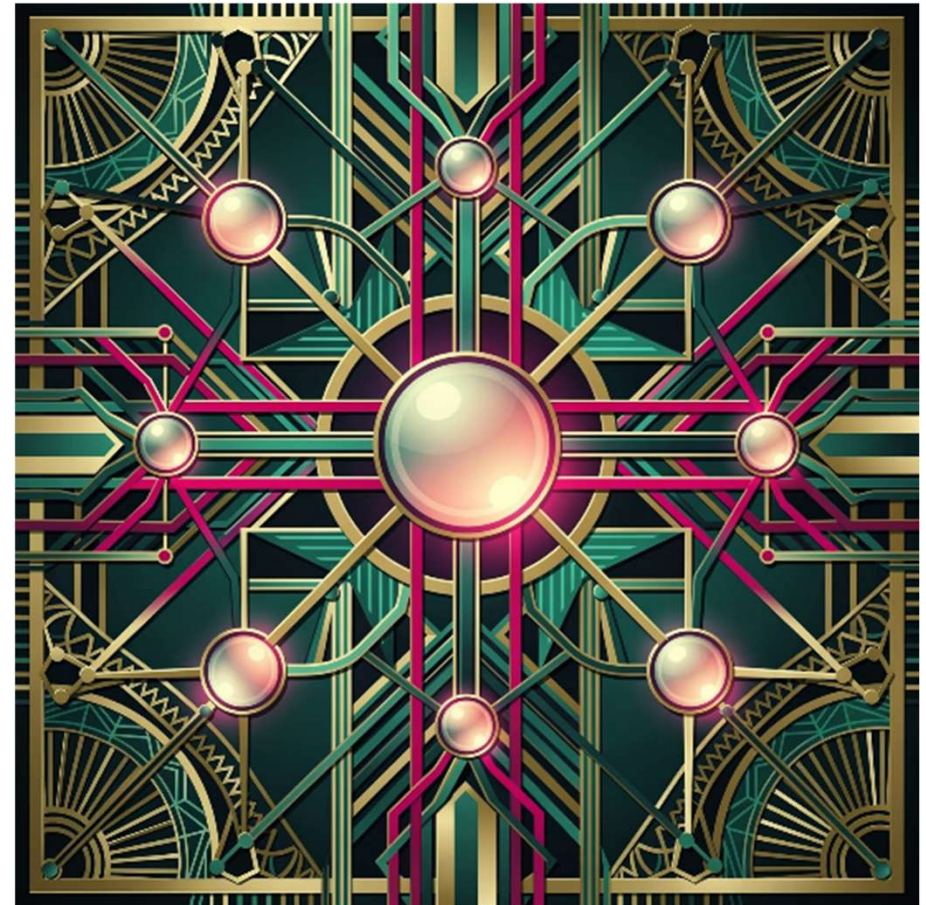
What it measures:

- Number of internal and external dependencies
- Tightness of coupling between project components
- Cross-project dependencies in the portfolio
- Supplier and vendor interdependencies
- Sequential vs. parallel dependency chains

Why it matters:

Dependencies create fragility — a delay in one area cascades through the entire project. The more interdependencies, the more coordination overhead and the higher the risk of systemic failure.

Score ranges from 1 (few, loosely coupled dependencies) to 4 (dense, tightly coupled interdependencies across multiple systems)



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Dimension Spotlight: Organizational Capability & Maturity

What it measures:

- PM methodology maturity level
- Availability of skilled resources
- Organizational change readiness
- Leadership experience with complexity
- Cross-functional collaboration effectiveness

Why it matters:

Even a well-designed project will fail if the organization lacks the maturity to execute it — mismatches between project complexity and organizational capability are a leading cause of failure.



Score ranges from 1 (high maturity, experienced team) to 4 (low maturity, inexperienced with this type of project)

Dimension Spotlight: Political Influence

What it measures:

- Level of internal or external political influence
- Presence of political interests in project approval
- Impact of political agendas on project feasibility
- Likelihood of overestimated benefits
- Likelihood of underestimated costs

Why it matters:

Political influence can distort project selection and prioritization, leading to initiatives that are not feasible or sustainable. When political agendas outweigh objective assessments, projects face higher risks of cost overruns, unrealistic benefits, and scope misalignment.

Score ranges from 1 (no political influence, no impact) to 4 (strong, multi-level political influence with major impact)



Dimension Spotlight: Risks

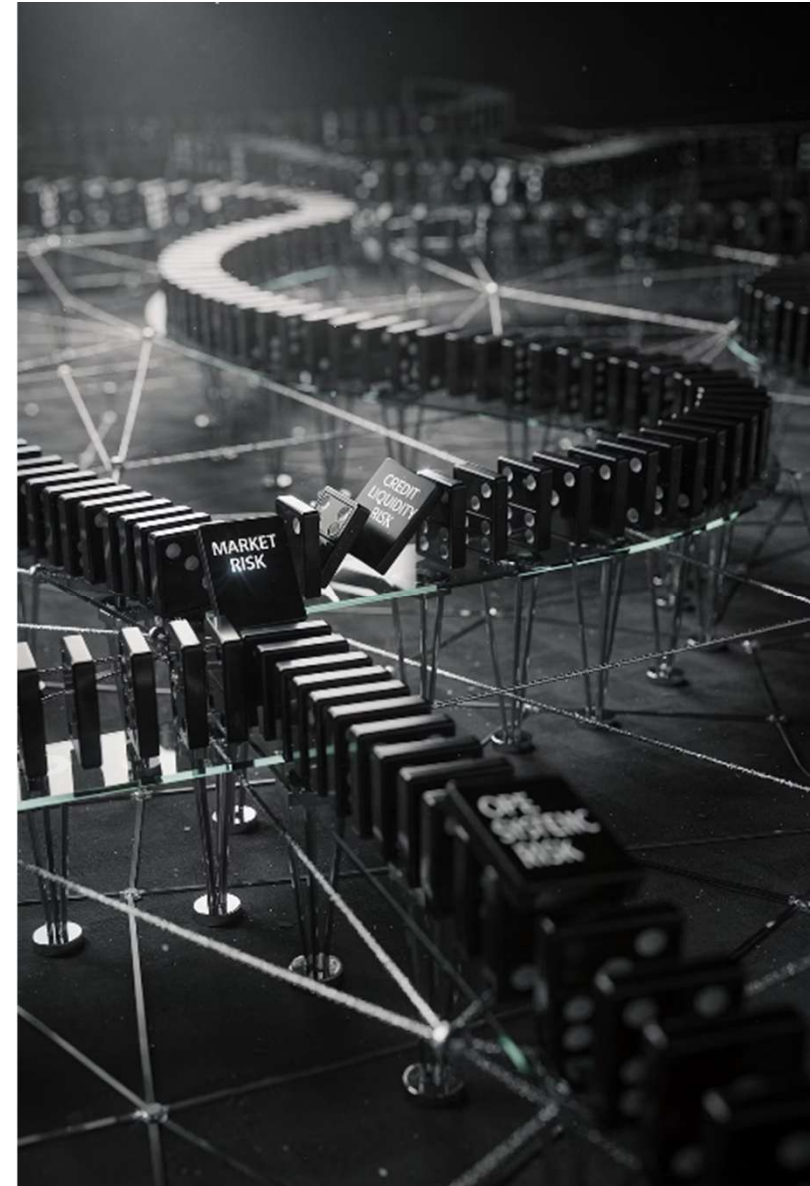
What it measures:

- Number and severity of identified risks
- Likelihood of risk materialization
- Cascading risk interactions
- Residual risk after mitigation
- Exposure to black swan events

Why it matters:

In complex projects, risks are not independent — they interact and amplify each other in unpredictable ways, making traditional risk registers insufficient. Understanding these interdependencies is crucial for effective mitigation strategies.

Score ranges from 1 (few low-impact risks) to 4 (numerous high-impact risks with cascading potential)



Dimension Spotlight: Stakeholder Interaction



What it measures:

- Number of stakeholder groups
- Diversity of stakeholder interests
- Power distribution
- Engagement levels
- Conflict potential

Why it matters:

High stakeholder complexity dramatically increases communication overhead and raises the risk of late-stage changes due to unaddressed needs.

Score ranges from 1 (most stakeholders aligned) to 4 (most stakeholders with conflicting interests)

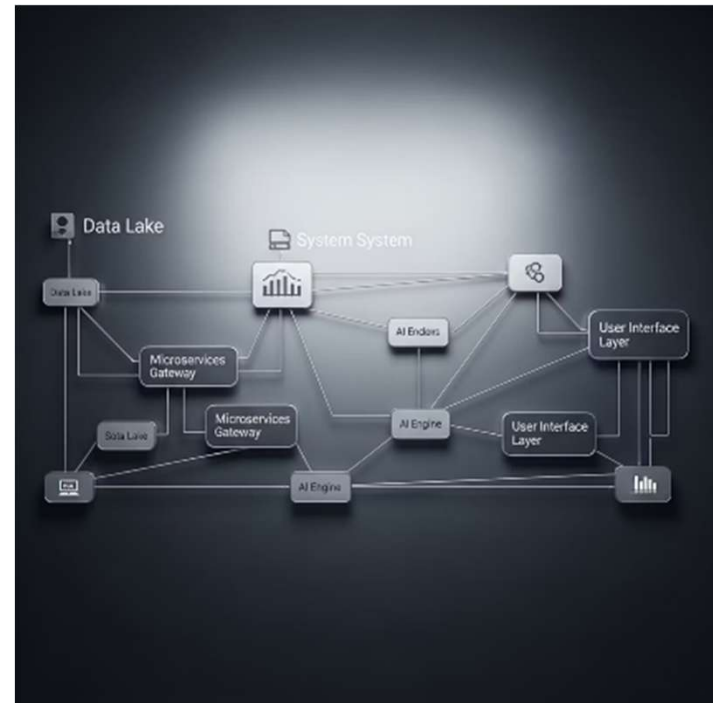
Dimension Spotlight: Technology

What it measures:

- Number of interacting technologies
- Novelty of technological elements
- Integration challenges
- Technological dependencies
- Specialized expertise requirements

Why it matters:

Projects with high technological complexity require more specialized resources, more extensive testing, and often face unexpected integration issues.



Score ranges from 1 (low tech) to 4 (super high-tech, critical technologies that do not exist)



Dimension Spotlight: Uncertainty

What it measures:

- Unknown unknowns vs. known unknowns
- Ambiguity in project scope or requirements
- Volatility of external environment
- Predictability of outcomes
- Clarity of success criteria

Why it matters:

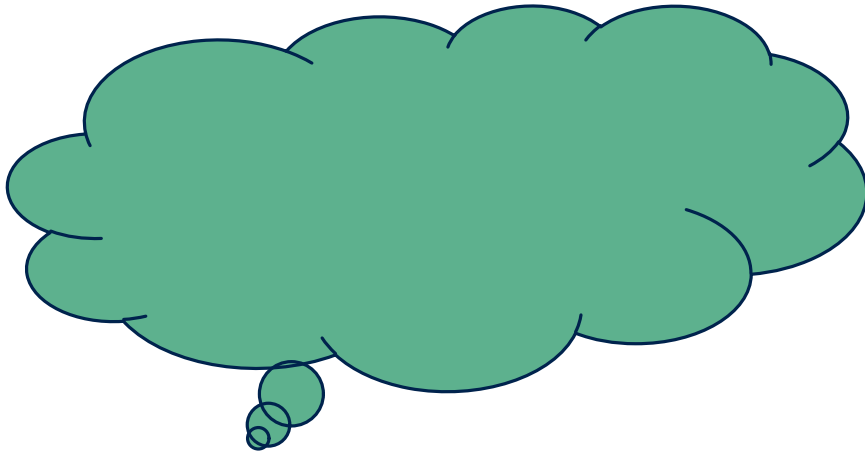
Uncertainty is the hallmark of true complexity — unlike risk, uncertainty cannot be quantified or planned for in advance. It requires adaptive leadership, methodologies, and approaches to navigate the emergent challenges that inevitably arise.

Uncertainty is the single most cited driver of project failure in complex environments

Score ranges from 1 (clear, well-defined outcomes) to 4 (highly ambiguous with undefined success criteria)

Poll #3

What do you think is the most important factor that increases complexity on projects?



Complexity's Impact on Cost Estimation

Why traditional estimation methods systematically fail on complex projects

Complex projects often face systematic underestimation due to cognitive biases and insufficient understanding of emergent factors. Three key pitfalls include:

Optimism Bias

Estimators anchor on best-case scenarios, ignoring complexity-driven variability and potential setbacks.

44%

of projects exceed budget

Reference Class Neglect

Teams fail to compare against similar complex projects, relying instead on idealized benchmarks for simpler contexts.

70%

of complex IT projects fail

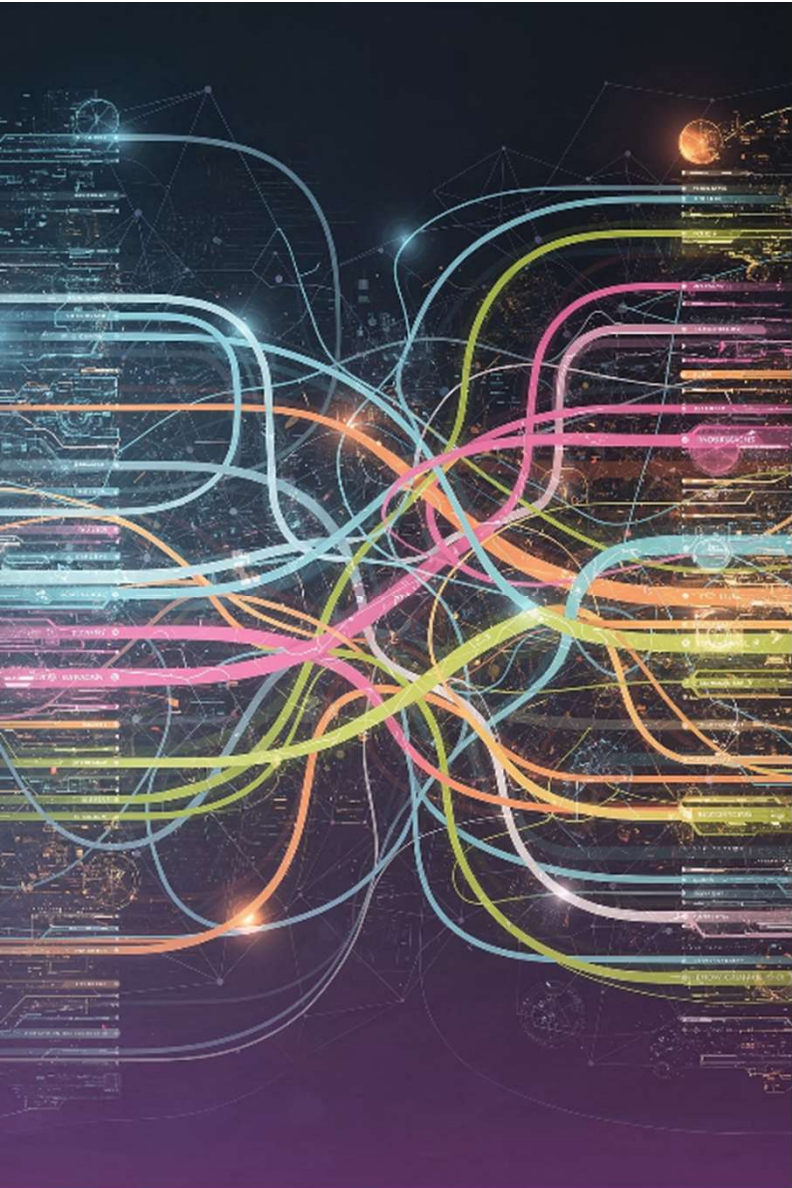
Scope Blindness

Complexity dimensions like stakeholder interaction and uncertainty create hidden scope that isn't captured in traditional Work Breakdown Structures.

27%

average cost overrun globally

The complexity assessment provides a structured way to adjust estimates based on empirically validated complexity factors — **moving from gut feeling to evidence-based forecasting.**



Complexity in Portfolio Management

Why Portfolio Managers Need Complexity Data

- Allocate senior PMs to highest-complexity projects
- Balance portfolio risk by mixing complexity levels
- Identify resource bottlenecks before they occur
- Set realistic executive expectations early
- Justify contingency budgets with objective data

Resource Allocation

Match PM experience level to project complexity score

Risk Balancing

Avoid clustering high-complexity projects in the same delivery window

Executive Reporting

Use complexity profiles to contextualize performance metrics

A portfolio of 10 projects with an average complexity score of 40+ requires fundamentally different governance than one with an average complexity score of 25.

Leading Through Complexity

Leadership strategies for high-complexity environments

01

Embrace Ambiguity

Resist the urge to force premature clarity; create space for emergent solutions.

02

Build Psychological Safety

Teams in complex environments must feel safe to surface bad news early and experiment without fear of failure.

03

Iterate and Adapt

Replace rigid plans with rolling wave planning, frequent retrospectives, and continuous feedback loops.

04

Distribute Decision-Making

Empower those closest to the work to make decisions, reducing bottlenecks and fostering agility.


05


Communicate Relentlessly


Over-communicate status, emergent risks, and changes to all stakeholder groups to maintain alignment and trust.


Implementing Complexity Management


A quick overview

 **Pilot Assessment**
Run the complexity assessment on 3–5 current projects to establish baseline scores and familiarize the team with the framework.

 **Calibrate**
Compare assessment results against actual project performance data to validate and refine scoring for your context.

 **Training**
Train project managers and sponsors on interpreting complexity profiles and applying targeted recommendations.

 **Rollout**
Embed complexity assessment into project intake, stage gates, and portfolio reviews as a standard governance requirement.

 **Ongoing: Monitor & Improve**
Re-assess projects quarterly and continuously improve the framework based on lessons learned.

Start small — even a single pilot assessment on your most troubled project can reveal actionable insights within days.

Addressing Common Objections

What we hear — and how we respond

"We don't have time for another assessment"

The assessment takes less than 15 minutes and can prevent months of rework. The ROI is immediate.

"Our project is unique — no framework applies"

The 15 dimensions were validated across industries and project types. Uniqueness is captured in the scoring, not the framework. Additional dimensions can be added.

"We already do risk assessments"

Risk registers capture known risks. Complexity assessment captures the structural conditions that generate unknown risks.

"Leadership won't support adding process"

Frame it as a cost-reduction tool. Complexity-adjusted estimates reduce the likelihood of embarrassing overruns.

Every objection is valid — but the cost of not assessing complexity is always higher than the cost of doing it.

Case Study: Enterprise CRM Implementation



Before Assessment:

- Initial 24-month timeline with 40% contingency
- Three failed attempts to launch pilot
- Executive sponsor questioning viability

After Complexity Management:

- Identified technical and organizational complexity
- Implemented 12 targeted recommendations
- Successful completion in 18 months (25% faster)
- 5% under budget

Case Study: National Infrastructure Megaproject

Project Profile:

- Multi-billion dollar highway expansion
- 7-year timeline
- 40+ stakeholder groups
- 3 government jurisdictions
- Novel environmental mitigation technology

Key Interventions:

- Dedicated complexity management office established
- Quarterly re-assessments built into governance
- Stakeholder engagement strategy redesigned
- Phased delivery model adopted to reduce interdependency risk
- Independent cost review using complexity-adjusted benchmarks

Complexity Assessment Results:

52/60

Total Score

4/4

Political Influence

4/4

Stakeholder Interaction

3/4

Uncertainty

Outcome:

Project delivered 8% under revised budget with all major milestones met — a significant achievement for a project of this complexity profile.

Without the complexity assessment, the original budget had no contingency for political and stakeholder dimensions.

Individual Exercise

Let's explore your projects

5-7 min

- What complexity dimensions resonate most with your current projects?
- Have you experienced cost overruns that complexity assessment might have predicted?
- What barriers exist in your organization to adopting a complexity framework?

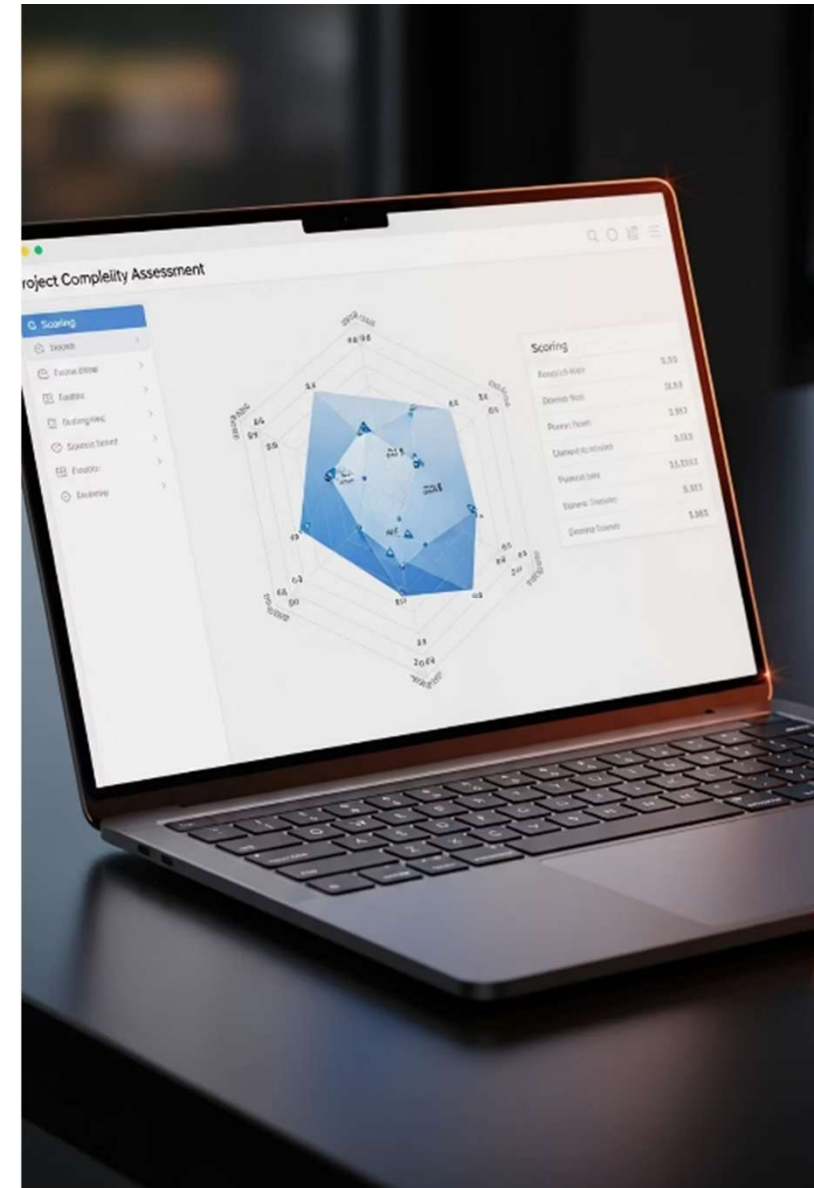
Instructions

1. Reflect on the projects you are currently managing.
2. Focus particularly on those you consider more complex.
3. Consider the questions above and identify a few examples or observations from your experience.
4. Be prepared to share your reflections on a volunteer basis (via Chat)



An Online Complexity Assessment Tool

www.complexitymodel.com



How the Assessment Tool Works

Answer 15 questions

Each question targets one complexity dimension with clear scoring criteria (1-4)

Review targeted recommendations

Receive specific actions to address your highest complexity areas (levels 3 and 4). *Optional AI-assisted recommendations.*

Generate complexity profile

The tool automatically creates a radar graph visualization of your project's complexity

Share with stakeholders

Export results to communicate complexity drivers with your team and sponsors

The Radar Graph Visualization

Why radar graphs work:

- Instantly visualize complexity across all dimensions
- Identify outlier areas requiring special attention
- Compare multiple projects on the same graph
- Track complexity changes over time
- Intuitive for non-technical stakeholders



📄 The shape tells a story - irregular patterns indicate imbalanced complexity that may require targeted intervention

Sample Assessment Results



38 / 60
Total Complexity Score

2.5 / 4
Average Complexity

7
High Complexity Areas

38/60

Total Complexity Score

2.5/4

Average Complexity

7

High Complexity Areas

Targeted Recommendations

The tool generates specific recommendations based on your highest complexity dimensions:

For Clarity of Goals (Level 3)

- Create a list of assumptions and accompanying constraints. Identify which assumptions and constraints are being tracked over the life cycle of the project so that changes can be reported.
- Develop a business case for the project including a benefits realization plan that discusses the expected benefits from the project. Be sure to include in the benefits realization plan:
 - A description of the benefits
 - Identification of each benefit as tangible or intangible
 - Identification of the recipient of each benefit
 - How the benefits will be realized
 - How the benefits will be measured
 - The realization date for each benefit
 - The handover activities to another group that may be responsible for converting the project's deliverables into benefits realization.

...



Live Demonstration

Let's assess a real project together

We'll walk through the assessment of a project, scoring each dimension and interpreting the results together

Individual Exercise

15 min

1. Select a project you are currently working on.
2. Access the complexity assessment tool.
3. Assess your project and review the model's recommendations.
4. Share one key insight or observation in the Zoom chat.



When to Use the Complexity Assessment

Recommended Timing:

- During initial project planning
- After major scope changes
- When experiencing unexpected challenges
- During portfolio prioritization
- When onboarding new project managers
- Quarterly for long-running projects

📌 Early assessment has the greatest impact on project outcomes by influencing initial planning decisions.



Key Takeaway: Making Complexity Actionable

Assess

Complete the online assessment for your project

Communicate


Share results with sponsors and team members

Plan

Implement targeted recommendations

Monitor

Re-assess quarterly to track changes

 Tip: Compare complexity scores across your portfolio to allocate resources where they're most needed. Projects with similar sizes but different complexity profiles require different approaches.



References

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- Herszon, Leon (2017). *The complexity of projects: an adaptive model to incorporate complexity dimensions into the cost estimation process*. Doctoral thesis, University of Huddersfield.
- Kerzner, Harold (2020) *The Growth of Project Complexity In a VUCA World*. Article.
- 2025. Online assessment tool by Value Edge Group - www.complexitymodel.com (www.valuededgegroup.com).
- Herszon, Leon (2026). *The Strategic Project Manager's Guide to Complex Projects: Understanding, Navigating, and Simplifying Project Complexity*.

Thank You!

Understanding and Assessing Project Complexity

"Complexity is not the enemy — lack of understanding is."

— L. Herszon



Let's Connect

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Wednesday, May 27, 2026

Roy Schilling, Enterprise Transformation Coach



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Wednesday, June 24, 2026

*Markus Kopko, Principal PPPM
PMotion.ai*

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