



## 2026 Conference and Expo Preconference Seminar

### Roadmap to Mastering AI in Total Cost Management

#### Course Overview:

This intensive one-and-a-half-day training course is designed for professionals seeking to enhance their data analytics skills and apply them to Total Cost Management. Participants will delve into intermediate and some advanced techniques and tools for data analysis, visualization, interpretation, and decision-making.

Participants will examine data and analytics techniques in a real-world setting to help them refine their fluency with data concepts, challenges, and applications. By the end of the course, participants will understand the requirements to:

- Define a use case for specific organizational needs and construct a prediction model.
- Implement analytical techniques like regression analysis for predicting an outcome based on specific questions.

The course is designed to provide a comprehensive understanding of key concepts, hands-on practice with industry-leading tools, and real-world case studies to reinforce learning.

#### What you'll get:

- Improved data literacy and the ability to communicate effectively with data analysts to determine when to use and how to interpret descriptive, predictive, and prescriptive analytics.
- Guidance on evaluating data analytics tools, such as machine learning, predictive models, regression analysis, and decision trees.
- Techniques for applying scientific thinking to business, such as examining cause and effect in data analysis.
- A deeper understanding of how to build a data-driven organization, including developing strategies to cultivate evidence-based decision-making.

#### Who Should Attend:

This course is designed for cost engineers and project controls practitioners who want to deepen their understanding of data and its outputs.

#### Prerequisites:

Given the course agenda, which covers foundational theory, practical applications, technical labs, and the strategic integration of AI into cost engineering and project controls, attendees should have:

- Basic understanding of project controls (cost, schedule, risk, and change management)
- Basic understanding of statistics
- Familiarity with Microsoft Excel
- Comfort interpreting graphs, tables, and dashboards

This ensures attendees can meaningfully participate in discussions, handle hands-on exercises, and understand how analytics integrate with project delivery processes.

## **Course Agenda:**

### **Day One:**

#### **08:00 – 08:30 | Welcome and Objectives**

*Understand the course's goals and agenda for mastering advanced analytics*

Provide a brief overview of the course.

- Define the elements of the course's objectives and schedule and provide an overview of the key takeaways.
- Introductions (participants, backgrounds, expectations) and introduce a couple of icebreaker polls.

#### **08:30 – 09:45 | Module 1: Introduction to Total Cost Management and AI**

*Understanding the foundations of total cost management, data for cost engineers and project control professionals, and the role of AI in improving predictability and decision-making.*

Provide a brief overview of the fundamentals of TCM, examining the interoperability of the key subdomains and their contributions to project success. Dive into the fundamentals of TCM and AI by understanding data attributes and comparing the various types of data.

- Understand the elements of TCM and their importance, specifically cost engineering and project controls, as well as planning, measurement, and assessment qualities. Recognize the benefits of Total Cost Management that support an advanced analytics initiative.
- Gain a concise definition of artificial intelligence, machine learning, and deep learning.
- Understand the core types of machine learning: supervised, unsupervised, and reinforcement.

Exercise 1: Assess your organization in terms of project (TCM) maturity and AI capabilities.

#### **09:45 – 10:00 | Break**

#### **10:00 – 11:00 | Module 2: Applying AI in the Pursuit of Strategic Value**

*From buzzwords to project delivery relevance – demystifying AI and its role in capital projects.*

Organizations and their project teams require a clear, practical understanding of artificial intelligence, encompassing not only the algorithms but also how these tools translate into tangible business impact. This module defines foundational AI and machine learning (ML) terms and introduces a framework that directly links AI capabilities to project outcomes.

- Determine the strategic purpose of using AI in project controls and developing the problem definition.
- Explore a use-case decision framework that enhances the strategic value of AI in capital projects.
- Discuss real-world examples across the capital project lifecycle where AI adds measurable value.
- Review how these AI use cases align with key business drivers: margin, risk, and accountability.

Exercise 2: Attendees will review the project delivery problems and assess whether AI is an applicable solution. The group will further discuss data and organizational requirements, among other topics.

#### **11:00 – 12:00 | Module 3: Predictive Modeling**

*Understanding the core techniques for developing relationships with the project data.*

Perhaps the single most essential tool in statistical modeling, regression is central to data literacy. Learn what regression does, how it fits into prediction, and what questions to ask data analysts (and yourself).

- Defining data-driven content for effective modeling.

- Define simple and multiple linear regression in total cost management.
- Identify independent variables (drivers) and dependent variables (outcomes) in regression models.
- Understand how regression supports scenario modeling and sensitivity analysis in TCM.

Exercise 3: Individuals will populate the graphs with the provided data to assess the variables' predictability. Once complete, a group discussion will be conducted to assess the target and predictor variables.

### **12:00 – 13:00 | Lunch**

### **13:00 – 14:15 | Module 4: Advanced Predictive Modeling**

*Future-focused cost management using predictive analytics and the basic types of ML and their application to project data.*

Understand predictive analysis, the construction of a prediction model, the application of machine learning and AI to prediction, and the strategic implications of prediction.

- Examine the predictive analytics approaches: define the question → gather data → build a model → validate → apply.
- Explore supervised vs. unsupervised learning and their application in project controls.
  - Key algorithms: Regression, Decision Trees, Random Forests, Neural Networks
  - When to use what: Forecasting, clustering, classification
- Understand the application for data interoperability and its elements, i.e., feature engineering.
- Interpreting model outputs and understanding the practical challenges of the dataset.

Exercise 4: Individuals will classify a list of projects according to their composite scores. Once completed, participants will visually model the classification logic.

### **14:15 – 15:30 | Module 5: Prescriptive Analysis - Scientific Thinking in Business**

*From data to decisions – designing and testing cost strategies.*

Molding raw data into a business strategy? Examine cause and effect in data analysis, design an experiment, analyze causal inference without experiments, and be prepared to prescribe a response to the likely results.

- Learn the foundations of experimental design: control groups, variables, and outcome tracking.
- Examine how to simulate cause-and-effect relationships in projects without controlled experiments.
- Apply scientific thinking to analyze outcomes (e.g., “What if we had accelerated procurement?”).
- Explore how AI can generate prescriptive options based on predictive model outputs.

Exercise 5: An interactive exercise where participants define cause-and-effect relationships using causal loop diagrams to visually understand project outcomes. Participants will provide insights to establish prescriptive actions.

### **15:30 – 15:45 | Break**

### **15:45 – 17:00 | Module 6: Large Language Models and AI Agents in Project Controls**

*Defining opportunities to apply large language models in the project controls environment.*

Learn how to harness the power of LLMs and AI agents to monitor project health, generate insights, simulate control decisions, and automate responses. Understand the requirements to build tools to improve performance across cost, schedule, and risk.

- Understand the fundamentals of LLMs.
- Understand the use of AI agents that can be used to simulate stakeholder decisions, draft scenario plans, and generate mitigation strategies.
- See where LLMs can enhance project controls: summarizing reports, developing SOPs, drafting RFIs, etc.

- Develop prompt engineering skills to extract structured outputs (e.g., risk registers, trend summaries) from unstructured inputs.

Exercise 6: Participants will create GPT-powered prompts to assist in reviewing and assessing the risks of a capital project.

## **Day 2 (Half Day)**

### **08:00 – 08:30 | Welcome & Opening (30 min)**

Recap of Day 1 concepts and introduction to the Day 2 challenge.

We introduce a hypothetical project delivered by ACME Inc., awaiting an investment decision on the QRA performed.

The committee is asking one question: *"How good are the inputs and what are they based on?"*

### **08:30 – 09:15 | Stage 1 — Monte Carlo from First Principles (45 min)**

Participants build and run a QRA the way ACME does today and observe the contingency decision it produces.

*The question is planted: every input was a judgment. What if we evidenced them instead?*

### **09:15 – 10:05 | Stage 2 — Observe, Transform, and Improve (50 min)**

Using ACME's historical project data, participants observe the data, justify the transformations, and then apply three ML techniques to replace the subjective inputs.

*Does the first-pass model reveal a gap in its training? Is the model doing its job?*

### **10:05 – 10:20 | Break**

### **10:20 – 10:55 | Stage 3 — Find the Missing Variable (35 min)**

Participants improve the model's accuracy by identifying a missing cost driver, adding it to the dataset, and retraining. Confidence lifts to a defensible level, and the improvement is visible and attributable.

*The lesson: more data rows don't fix a missing variable. The right feature does.*

### **10:55 – 11:30 | Stage 4 — Re-Run the Monte Carlo, Change the Decision (35 min)**

The improved inputs replace the Stage 1 subjective values. The same Monte Carlo runs again. The before/after S-curves load in Power BI.

*Decision exercise: The Project Manager is in front of the oversight board tomorrow. Which S-curve does he present — and which contingency number can he defend when they ask "how do you know the inputs are good?"*

### **11:30 – 12:05 | Stage 5 — Execution: Predict from Performance Data (35 min)**

Jump forward one year. The project is in delivery. EVM is controlling contingency. ACME now has live performance data, a fundamentally different situation from planning. Participants engineer features from the EVM history and train a supervised predictive model to forecast EAC and contingency adequacy directly, without Monte Carlo.

*Two phases of a project's life, two analytical approaches. Monte Carlo for uncertainty in planning; supervised prediction for performance in execution.*

### **12:05 – 12:30 | Closing — Personal AI Roadmap, Q&A & Certificates (25 min)**

Each participant completes a one-page Personal AI Roadmap: their maturity level, the QRA input they will stop assuming and start evidencing, and their 30-day commitment.

Final Q&A, certificates, and closing remarks.

## Brief version

### Title: Roadmap to Mastering AI in Total Cost Management

#### Day 1 (Full Day)

##### **08:00 – 08:30 | Welcome and Objectives**

Understand the course's goals and agenda for mastering advanced analytics

##### **08:30 – 09:45 | Module 1: Introduction to Total Cost Management and AI**

Understand the foundations of total cost management, data for cost engineers and project control professionals, and the role of AI in improving predictability and decision-making.

##### **09:45 – 10:00 | Break**

##### **10:00 – 11:00 | Module 2: Applying AI in the Pursuit of Strategic Value**

From buzzwords to project delivery relevance – demystifying AI and its role in capital projects.

##### **11:00 – 12:00 | Module 3: Predictive Modeling**

Understanding the core techniques for developing relationships with the project data.

##### **12:00 – 13:00 | Lunch**

##### **13:00 – 14:15 | Module 4: Advanced Predictive Modeling**

Future-focused cost management using predictive analytics and the basic types of ML and their application to project data.

##### **14:15 – 15:30 | Module 5: Prescriptive Analysis - Scientific Thinking in Business**

From data to decisions – designing and testing cost strategies.

##### **15:30 – 15:45 | Break**

##### **15:45 – 17:00 | Module 6: Large Language Models and AI Agents in Project Controls**

Defining opportunities to apply large language models in the project controls environment.

#### Day 2 (Half Day)

##### **08:00 – 08:30 | Welcome & Opening**

Day 1 recap. Introduction to ACME Inc. and the investment decision they can't yet defend.

##### **08:30 – 09:15 | Stage 1 — Monte Carlo from First Principles**

Build and run a QRA with subjective inputs. Observe the contingency it produces.

##### **09:15 – 10:05 | Stage 2 — Improve the Inputs with ML**

Use ACME's historical portfolio to replace subjective inputs with data-derived ones. First-pass model reveals a gap.

##### **10:05 – 10:20 | Break**

##### **10:20 – 10:55 | Stage 3 — Find the Missing Variable**

Diagnose the gap, identify the missing cost driver, and retrain. Confidence lifts to a defensible level.

**10:55 – 11:30 | Stage 4 — Re-Run the Monte Carlo**

Feed the improved inputs back in. Compare before/after in Power BI. Make the decision.

**11:30 – 12:05 | Stage 5 — Execution: Predict from EVM Data**

One year later. Train a predictive model on live EVM performance data to forecast EAC and contingency adequacy — no Monte Carlo needed.

**12:05 – 12:30 | Closing — Personal AI Roadmap, Q&A & Certificates**