ANALYTICS EDUCATION

PROJECT RISK ANALYSIS & MODELLING SKILLS

2day | 16hr professional workshop

OVERVIEW

If you need to calculate the odds of delivering on-time or on budget, the only way is through probabilistic project risk analysis.

TARGET AUDIENCE

People who need to develop quantitative risk analysis skills to manage uncertainty and make predictions in large projects. E.g. Business Analysts, Managers, Executives and Consultants.

Using Oracle Crystal Ball or Palisade's @ RISK, participants will learn simple and effective quantitative modelling techniques/skills and tools to calculate the odds of success using Monte-Carlo Simulation. Focused on project risk analysis, participants will discover how to use Monte-Carlo simulation and optimization tools to make decisions and assess risk in day-to-day situations as well as planning for building complex models & forecasts.

This workshop is designed for both the beginner and advanced business analyst and we will fully cover the A to Z of applying risk analysis techniques and modelling best practices to *CAPEX Cost Estimates, Project Schedules and Discounted Casflows*.

WORKSHOP CONTENT

MODULE 1 – ENHANCING THE MODELING PROCESS WITH SIMULATION

Why is Risk Analysis critically important in today's world?

- Making decisions under uncertainty
- Where risk analysis and simulation integrate with the planning process
- *The flaw of averages:* Why 70%+ projects fail to deliver on expectations
- Understanding risk analysis key concepts and definitions
- ***Workshop:*** *What does 90% confidence really mean?*

Modeling vs. Simulation

- Overview and history of Monte-Carlo Simulation
- Advantages and Disadvantages of simulation
- *How* and *Where* predictive modelling and risk analysis can have a positive impact on the organization

The Modeling Process

- Modelling best practices for formating and organizing spreasheet models to be clear and easily auditable.
- Sourcing and using historical or published data
- Discussion on using the Monte-Carlo Method for properly scoping the need, building assumptions and establishing model constraints with Subject Matter Experts
- ***Workshop:*** *Using risk analysis to develop a New Compensation Model*

Using and Configuring Crystal Ball for Risk Analysis: Toolbar, Basic Terminology, Sampling, Reporting and Data Extraction

MODULE 2 – BUILDING AND RUNNING MODELS

Essential Statistics For Risk Modeling

- *Workshop: Understanding how probabilities work with the DICE model*
- Basic probability statistics (Mean, Standard Deviation, Kurtosis, Skewness)
- Overview of principal distributions and when to use them
- How Multi-Modal distributions are generated

Tornado Charts and One Way Sensitivity Analysis

- Analyze existing models to identify inputs with the greatest impact.
- Spider-Charts vs Tornado Charts
- Workshop: Analyzing variables to model in a Loan Process

Fundamentals in Project Estimation

- What is Project Risk Analysis
- Working defenition of a good project estimate
- Overestimating vs. Underestimating
- The difference between: *Targets, Commitements, Estimates and Plans.*

Working with Distributions and Model Inputs

- Best practices for defining model inputs in Excel and selecting the right distribution
- Continuous vs. Discrete Distributions
- Comparing risk profiles:
- How to correctly ask for ranges
- Using Custom Distributions
- ***Workshop:*** *How different distributions compare using the same input parameters.*

Defining, Analyzing and Communicating results to the business

- Setting up model outputs and visualizing results and charts (Sensitivity, Forecasts, Assumptions and Overlays)
- Establishing Confidence Intervals and configuring precision control to optimize the number of trials
- Generating simulation result reports & documentation
- Techniques to effectively and simply communicate your analysis to your peers, clients and superiors
- Question handling

Project Risk identification and Assessment using Simulation

- Interpreting Forecasts and Sensitivity Analysis
- Using Monte-Carlo simulation to calculate project contigencies.
- Discussion on how to correctly organize risks into schedule, cost and market models.
- ***Workshop:*** *Schedule Risk Analysis*
- ***Workshop:*** *Analyzing Cost Estimates with conditional costs and discrete risk registries.*

MODULE 3 – INCORPORATING HISTORICAL DATA AND TRENDS INTO YOUR SIMULATION MODELS

Correlation and Regression

- What are correlations and their impact on results
- Making sure your model behaves correctly using correlation
- 3 techniques to calculate correlation and their differences.
- Overview of regression and its basic applications
- Discussion on the how Monte-Carlo simulation works.
- ***Workshop:*** *How to calculate rank correlation and use it to correlate model assumptions*
- Aggregate Assumptions

Data/Distribution Fitting

- How to research which distributions you should fit.
- Best practices on how to source and fit historical data using statisitical methods.
- Analyzing fit results and selecting the RIGHT distribution for both univariate and multivariate data.

Time-Series Forecasting

- Forecasting vs. stress-testing your model over time.
- Overview of the components and applications of time-series forecasting
- Univariate Forecasting using Gemoteric Brownian Motion by calculating historical trend and volatility. (Escalation/Inflation Models)
- Time-series projections using to easily incorporate Seasonality, Smoothing algorithms, Growth Projections using historical data
- ***Workshop:*** *Projecting Next Year's Sales using CB Predictor.*
- ***Workshop:*** *Building Correlated Forecasts using Multiple Linear Regression using CB Predictor.*

MODULE 4 – OPTIMIZATION AND SCENARIO MODELING

Simulation Optimization

- Introduction to Simulation- Optimization with OptQuest
- Everyday Optimization applications and examples

Portfolio Optimization Techniques : With the help of several integrated financial models, this workshop will provide financial analysts with a complete understanding of why, where and how to apply spreadsheet forecasting, simulation, real options and optimization within their analyses.

- ***Project Portfolio Selection:*** Use OptQuest to pick the best projects based on Organizational Budget Constraints
- ***Portfolio & Resource Allocation Optimization:*** Allocate resources or budgets among various investments to maximize NPV or ROI or minimize risk or expense.
- ***Modeling Efficient Frontier*** Analysis to optimize risk against benefit for projects and investments. (Portfolio Allocation)

Decision Tables to compare complex 2 dimensional problems

- ***Workshop:*** *Inventory Options*
- ***Workshop:*** *Oil Field Development Strategies*
- *Creating 3D solution plots*

BENEFITS

At the end of this 16hr workshop, participants will be able to:

- Understand and apply Monte-Carlo simulation and optimization in their day-to-day activities.
- Quickly build effective models or customize existing ones with Crystal Ball or Palisade @RISK.
- Pick and manage project more effectively
-
- Use Monte-Carlo-Simulation to calculate risk based contigencies for projects and schedules.
- Clearly explain how Monte-Carlo simulation works and how its results should be interpreted.

PRE-PAID REMOTE TRAINING

Our workshops last 16hrs / 24hrs and are delivered, one-on-one, in 2 hour sessions at your convenience. Just call to book the times that work best in your schedule. Each 16 hour remote training program is billed at 2,199.00$ and 24hrs at 3,175.00$ USD

Our remote and onsite training topics for Crystal Ball, Primavera Risk Analysis, RiskSolver, Julia, @RISK and ModelRisk include:

- Business and Financial Modeling
- Process Modeling
- Project Planning & Estimating Skills
- Forecasting
- Business Statistics

Visit ***https://store.technologypartnerz.com/risk-and-business-analysis-training*** *for a complete list*

ORACLE CRYSTAL BALL

PALISADE partner