Introduction to NetRisk™
GPM-Based Schedule Risk Analysis

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Schedule Risk Analysis with NetRisk

- Risk Manager - Simplified and Intuitive Risk Analysis Platform
- Qualitative Risk Analysis
  - Interactive Risk Register
  - Probability & Impact Matrix
  - Risk Breakdown Structure
- Quantitative Risk Analysis
  - Duration Sampling, Floating and Pacing
  - Introducing *Prime Risks*
  - Sensitivity Analysis
  - End Node Diagram (View Schedule at Selected Percentile)
  - Scenario Modeling (Easy Comparison of Different Scenarios)
Risk Manager - Overview

Simplified and intuitive risk analysis platform for analysts and non-analysts

- Risk Register
- Risk Breakdown Structure (RBS)
- Rules
- Sampling
- Branches
- Run
- Results
Qualitative Risk Analysis

- Risk Register

Instinctive Risk Register that allows a 2-way assignment (i.e., risk-to-activity or activity-to-risk).

The NetRisk Manager allows users to export input/output data at any time during the analysis.

Intuitive Qualitative Property Box permits easy population of uncertainty information about the project.
Qualitative Risk Analysis

- Probability and Impact Matrix

Gear Icon opens the Qualitative Thresholds window.

Matrix used to define Probability and Impact factors in their respective scales. These factors together will determine and automatically feed each Risk-Rating.

There are 6 pre-defined Themes for the Probability Impact Matrix, which include Fire, Forest, Horizon, Ice, Pond, and Rainbow.
Qualitative Risk Analysis

• Risk Breakdown Structure

NetRisk provides two RBS to classify the different types of identified risks. The 2 options available are NetRisk RBS & Standard RBS. Users will have option to import RBS from Excel in future release.

Two hierarchy levels add more granularity to the Risk Taxonomy.

Probability Distributions can also be assigned to the specific categories for a global risk allocation.
Quantitative Risk Analysis

• Duration Sampling, Floating and Pacing

Global Range is a shortcut to ranging activity durations when there is limited detail, often in the concept and schematic stages of a project. It is also used to quickly assess the overall risk in a project.

What Probability Distribution Function Should be Used?

Duration Ranging captures activity duration risk limited to estimating uncertainty or estimating judgment.

Floating: Scheduling strategy that considers the predicted (deterministic) float of an activity and that involves delaying the start of an eligible activity within its float then existing when the activity is scheduled.

Pacing: Scheduling strategy that, based on the predicted (deterministic) duration of an activity, involves delaying the start of an eligible activity within its float then existing when the activity is scheduled, if the then-existing float exceeds the activity deterministic float by a threshold.
Quantitative Risk Analysis

- Prime Risks

Unique to NetRisk, **Prime Risks** have **different probabilities of occurrence** or **p parameters** vis-à-vis each associated activity. In other words, Prime Risks allows the user to assign different probability parameters for the same risk to various activities.

A **Group** enables the user to **cluster together** two or more activities assigned to a particular risk, which has a common likelihood but may have different impact values for different activities.

Assigning Prime Risks to Activities or vice versa is accomplished via the NetRisk Manager.
Quantitative Risk Analysis

- Rules (Correlation)

Relative to correlated sampling among activity durations, where an activity is affected either positively or negatively by another, the user can model the relationship with a correlation coefficient.
Quantitative Risk Analysis

- Run

Pre-Treatment and Post-Treatment scenarios are investigated by selecting and implementing alternatives to modify high-priority risks from the SRA simulation model to achieve alternate simulation results that improve the probability threshold.

NetRisk offers both Monte Carlo sampling, and Latin Hybercube sampling.

Rules of Convergence enable the simulation to be stopped when results from the simulation become stable based on some criteria.
Quantitative Risk Analysis

• Results

NetRisk provides Distribution graphs (histograms and S-curves) for each selected activity, milestone, and benchmark in the project model. The graphs can be maximized to facilitate their evaluation.

A comprehensive list of output is available to the user to perform sensitivity analysis, prime risk sensitivity, driving links and gap analysis.
Quantitative Risk Analysis

• Sensitivity Analysis
  – NetRisk **Criticality** is displayed through criticality indices, and it represents how much time each activity was on the critical path during the simulation.
  – NetRisk **Cruciality** is Williams’ Cruciality, or the correlation between sampled activity duration and project duration, for all realizations.

NetRisk **Priority Index** - For each activity, it is simply calculated as Priority Index = Criticality*(1+ Cruciality)

Sensitivity Analysis is performed using **Pearson’s Product Moment** and **Spearman’s Rank Correlation** to account for relationship between variables when creating correlated series, Pearson’s correlation measures relationship between Activity Duration & Project duration and Spearman’s Correlation measuring the correlation between two values calculated by sorting (ranking) each value in the pair.
Quantitative Risk Analysis

• End Node Diagram (View Schedule at Selected Percentile)

The End Node Diagram displays Activity durations at selected percentile.

The End Node Diagram displays Criticality & Priority Index for a simulation.
Quantitative Risk Analysis

• Easy Comparison of Different Scenarios

This comparison highlights different treatment strategies applied to increase likelihood of achieving the deterministic project completion.
# Contrasting NetRisk with other Risk Software

## Comparing NetRisk Features with Other SRA Software

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<td>Relies on Time Scaled LDM Networks</td>
<td>It relies on archaic logic CPM Networks.</td>
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<td>Risk Register allows a 2-way assignment</td>
<td>Risk-to-activity or Activity-to-risk</td>
<td>Risk-to-activity or Activity-to-risk</td>
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<td>Risk Breakdown Structure</td>
<td>Provides Templated RBS with Two Hierarchy Levels, Import, and Export. Risk Probabilities &amp; Impacts can be assigned to RBS</td>
<td>Limited RBS/Ribbon Template. Does not allow Risk Assignment to RBS.</td>
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<td>Prime Risk Capability</td>
<td>Ability to Assign Same Risk with Different p Parameters to Various Activities</td>
<td>New Risks have to be created to assign different p parameters to various Activities.</td>
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<tr>
<td>Floating and Pacing</td>
<td>Available owing to GPM Algorithm</td>
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<tr>
<td>Branching</td>
<td>Probabilistic &amp; Conditional Branching can be modeled</td>
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<td>Sensitivity Analysis</td>
<td>Allows for Concurrent Pearson's and Spearman's Calculations</td>
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<td>P6, Excel</td>
<td>P6, MS Project, Excel, Deltek Risk+</td>
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<td>Activity Sensitivity defined as ‘Priority Index’ is based on Criticality*(1+Cruciality)</td>
<td>Activity Sensitivity is based on Criticality*(Cruciality)</td>
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NetRisk

• Questions & Answers
Thank You

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