

RiskyProject Lite 7.2

Project Risk Management Software

User's Guide



Intaver Institute Inc.

www.intaver.com

email: info@intaver.com

Copyright © 2022 Intaver Institute. All rights reserved.

The information in this document is subject to change without notice. The software described in this document is furnished under a license agreement. This software may be used or copied only in accordance with the terms of such agreement. It is against the law to copy the software on any medium except as specifically allowed in the license agreement. No part of this document may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopying and recording, for any purpose without the express written permission of Intaver Institute.

RiskyProject™ and Event Chain Methodology™ are trademarks of Intaver Institute.

Microsoft® is a registered trademark of Microsoft Corporation. Windows®, and Project®, are registered trademarks of Microsoft Corporation. All other names and trademarks are the property of their respective owners.

Contents

Chapter 1: Introduction to RiskyProject	9
What is RiskyProject?	10
Who should use RiskyProject?	12
New Features of RiskyProject Lite 7.2	13
Qualitative vs. Quantitative Risk Analysis	14
RiskyProject Interface	15
Application Look	15
Customizing Workflow Bar	16
RiskyProject Data Sheets	16
Chapter 2: Qualitative Risk Analysis and Management	19
Risks in RiskyProject	20
Risk Register	20
About Risk Categories, Probabilities and Impacts	24
Risk Mitigation and Response Plans	31
Creating a mitigation or risk response plan	31
Risk Attributes	33
About Risks	33
Risk Probabilities and Impacts	34
Risk Form: Defining Information About Risks	36
About Cost of Risk Calculations	38
Custom Risk Properties	40
Risk Reviews	40
Assigning Risk Response Plans	41
Assign Mitigation Plans	41
Risk History	43
Risk Matrix and Risk Trend Chart	44
Viewing the Risk Matrix	44
Viewing the Risk Trend Chart	45
Risk Report	47
Customize the Risk Report	47
Risk Dashboard	49
Setting up Defaults for Qualitative Risk Analysis	51
Risk ID Settings	51
Managing Risk Categories and Outcome Types	52
Risk Weighting	54
Managing Default Risk Properties	55
Format the Risk Matrix and Risk Trend Chart	55
Chapter 3: Managing Project Schedules	63
RiskyProject for Microsoft Project and Oracle Primavera	64
RiskyProject as a Standalone Application	64
RiskyProject for Microsoft Project	64
Using Microsoft Project Add-In	66

About installing the RiskyProject/Microsoft Project integrated solution	69
XER File Import Settings	72
Setting up your projects	74
Setting up your project defaults	74
Setting up viewing defaults	74
Setting up duration defaults	75
Setting up calendar defaults	75
Setting up project units	76
Setting up calculation options	76
Setting up cost defaults	77
Setting up Calendars	78
About Calendars in RiskyProject	78
Creating Projects	82
Creating a new project	82
Importing existing project schedules	82
Project Settings	84
General Project Information	84
Project Start Time	84
Project Status Date	84
Project Calendar	84
Project Tasks	85
Predecessors and Lags	87
Constraints	88
Milestones	89
Task Deadlines	90
Subprojects	91
Advanced Task Management	92
Formatting Gantt Bars	93
Managing Resources and Work	94
Managing Costs	96
Cost, Income, and Profit Calculations in RiskyProject	96
Variable and Fixed Costs and Income	97
Chapter 4: Quantitative Risk Analysis	99
Assigning Risks to Tasks and Resources	100
Risk Assignments	100
Converting your project from Qualitative to Quantitative Risk Analysis	101
Risk Attributes for Quantitative Risk Analysis	102
Assigning local and global risks	103
Risk Assignments on the Gantt Chart	107
Risk Correlations	108
How correlated risks are calculated	108
Managing Uncertainties	110
Assigning Low, Most Likely, and High Estimates for Duration and Cost for Group of Tasks	111
Finding Text or Data	111
Assigning Low and High Estimates for Duration and Cost to Found Tasks	112
Chapter 5: Analyzing Project Results	115

Calculations	116
Analyzing Results	117
Results Gantt Chart	117
Resource Allocation	118
Chapter 6: Project Control	121
Tracking Performance	122
Calculating and reassessing tasks using tracking data	122
Tracking Results	123
Viewing Tracking Data	124
Chapter 7: Reporting Project Results	127
Statistics Report for Quantitative Analysis	128
Customizing the Statistics Report	129
Setting up reports	130
Images and Pictures	131
Exporting Projects	132
Additional Information	133
Frequently Asked Questions	134
Glossary	139
Index	147

Chapter 1: Introduction to RiskyProject

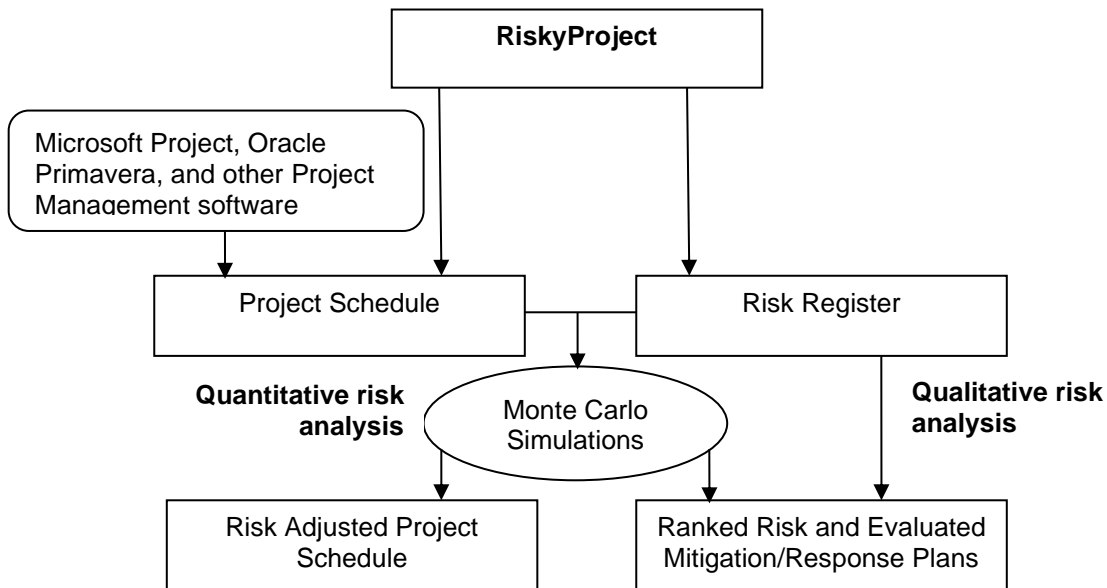
What is RiskyProject?

RiskyProject is advanced project risk management software with integrated risk analysis. Most projects contain many uncertain parameters: task duration, start and finish times, uncertainties in costs and resources, uncertainties in quality, safety, technology, and others. RiskyProject analyzes project schedules with risks and uncertainties, calculates the chance that projects will be completed within a given period of time and budget, ranks risks, and presents the results in formats that are easy to read and understand.

RiskyProject also helps you to perform project risk management:

- identify project risks
- rank risks
- identify mitigation and response plans
- manage risk properties, including descriptions, probabilities and impacts, costs associated with risks, mitigation strategies, and all other information about risks
- facilitate risk reviews, opening and closing risks, conversion of risks to issues and lessons learned
- provide comprehensive risk reporting, save risk history

RiskyProject performs both qualitative and quantitative risk analysis. If both the risk register and project schedule are populated, RiskyProject performs quantitative risk analysis. If there is no project data (cost or schedule), RiskyProject performs qualitative risks analysis.



RiskyProject seamlessly integrates with Microsoft Project or can run as a standalone application. RiskyProject integrates with other project management software such as Oracle Primavera.

RiskyProject employs Event Chain Methodology to analyze project uncertainties defined by multiple risks (events). An example of an event would be a task delay due to the changes in requirements. In many cases, one event can cause another event or multiple events, which can

significantly affect the project schedule. RiskyProject recalculates the project schedule multiple times to compute the distribution of possible outcomes and probabilities of meeting specific objectives.

Who should use RiskyProject?

RiskyProject performs two major functions:

- Risk Management: identification, recording, ranking, and reviewing risks, mitigation and response plans, and all associated risk information.
- Risk Analysis: determining how risks might affect your project.

RiskyProject is beneficial for managers who want to perform risk analysis on their projects without specialist expertise or training in risk analysis. RiskyProject allows managers to quickly analyze a complex project schedule and associated costs, with multiple tasks and dependencies. It is a user-friendly system with an intuitive interface, which hides its advanced mathematical calculations and helps managers make informed decisions.

RiskyProject is useful for managers of research and development projects, including software projects, who run projects with multiple uncertainties using an iterative development process. It is a widely accepted fact that project management best practices and processes emphasize the importance of iterative development and risk tracking, which represents the cornerstone of the RiskyProject workflow.

RiskyProject is used in many industries, including aerospace and defense, IT, engineering and construction, manufacturing, agriculture, pharmaceutical, energy, and mining.

New Features of RiskyProject Lite 7.2

RiskyProject 7.2 is a major software release. It includes multiple improvements for both its project risk management and risk analysis capabilities. The following features are implemented in both desktop version of RiskyProject Lite and Enterprise version:

1. **Risk Form:** a fully customizable form to enter risk properties, as well risk probabilities and impacts. You can create any risk properties or select them from the list of predefined properties. Then you can drop them on the form. The form can be annotated with lines and text. Once you design a form it can be used for all future projects.
2. **New Risk Dashboard:** present hundreds of different key performance indicators (KPIs) and charts related to your risks with a fully customizable Risk Dashboard. Dashboards can present data in a variety of ways including charts - line, area, pie, scatter, bar (including frequency histogram), meters, and risk matrixes. You can place them in different areas on the dashboard, and adjust their size, colors, and other properties. Dashboards can be annotated using text, lines, and images. Dashboards can be printed or exported.
3. **Inserting Subprojects with Results of Simulations:** you can now create a Summary or Master project schedule using the simulation results of subprojects. In these summary projects, the results of one or more subprojects (statistical results of a Monte Carlo simulation) are inserted as a task(s). This process allows you to analyze the results of projects and also use these analyses, as part of a larger summary project. This significantly reduces the calculation time and helps to simplify the management of large projects or programs.
4. **Mitigation plans can now be linked to tasks** or a group of tasks within a project schedule. This linking will read the schedule data into the mitigation plan to calculate costs and planned finish and actuals. You can now manage groups of tasks as mitigation activities. Also, mitigation plans can now have multiple custom fields, which you can use as mitigation plan properties.
5. **Most Likely Duration and Fixed Cost:** define most likely values for duration and fixed cost. While base duration and fixed cost are deterministic values from original project schedule, most likely duration and fixed cost are distribution parameters. Most likely values are now used in uncertainty bands.
6. **Schedule Data Import and Filtering:** filter list of tasks or resources based on certain condition. It helps in managing large schedule. Also you can import more data fields from Microsoft Project and Primavera.
7. **Multiple Risk Response Plans:** define any number of risk response plans assigned to one risk.
8. **Improved User Interface:** Usability has undergone multiple improvements, including introduction of new RiskyProject workflow bar. A number of dialog boxes that have been re-designed for better usability. This also includes a new Risk Trend view and improvements to other views.
9. **Improved Calculation and Data Presentation Performance:** Monte Carlo simulation performance and refresh rate of views, charts, and diagrams has been enhanced.

Qualitative vs. Quantitative Risk Analysis

RiskyProject performs both qualitative and quantitative risk analysis.

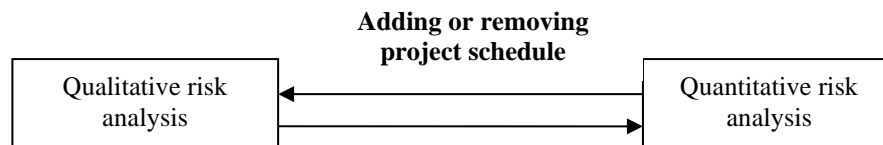
A typical **qualitative risk analysis** workflow is used to:

1. Identify risks and add risks to the risk register.
2. Define risk properties, probabilities, and outcomes.
3. Analyze risks and prioritize risks.
4. Assign mitigation and/or response plans.
5. Update risk properties, probabilities, outcomes as necessary.
6. Review status and properties of the risk and report information about risks.

A typical **quantitative risk analysis** workflow is used to:

1. Create a project schedule.
2. Add risks, uncertainties, and other risk-related information.
3. Run a simulation, perform an analysis and generate a report of the results.
4. Update risks and uncertainties as necessary.
5. During project execution, perform project tracking with risks and uncertainties at key phases or milestones to update forecasts.
6. Report results

If you do not have a schedule for your project, RiskyProject will only perform qualitative risk analysis. However, if you add a schedule by either adding activities or importing a schedule, RiskyProject automatically switches to quantitative analysis. You may switch between qualitative and quantitative analysis by adding or removing a project schedule.



Due to the nature of qualitative and quantitative analysis the results can be different even with the same risks, particularly for schedule-related risks affecting project duration and cost.

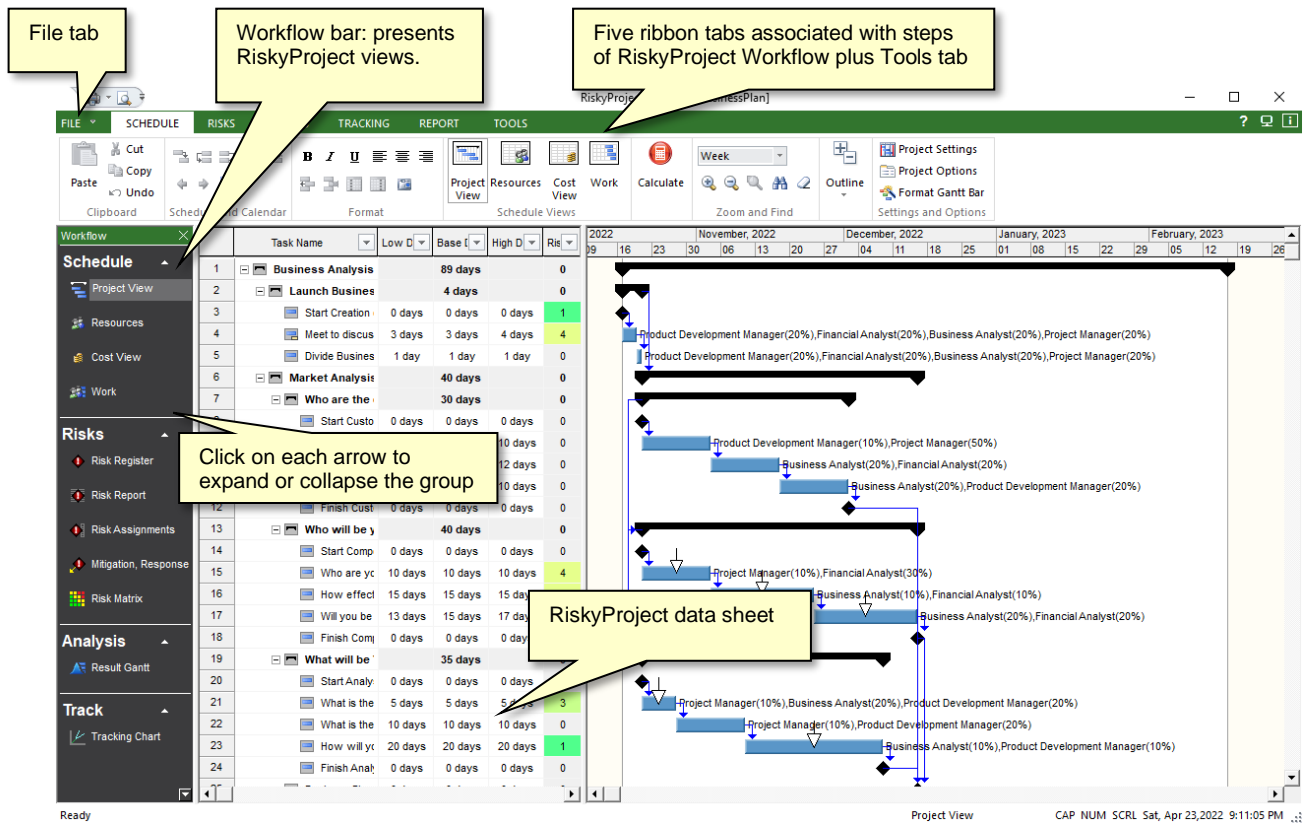
RiskyProject Interface

RiskyProject workflow includes five steps:

1. **Schedule:** Enter or import Schedule, Resources, Cost and Income, and Work
2. **Risks:** includes a Risk Register and Risk Dashboard, Assign risks to tasks and resources, Mitigation/Response plan depository; Risk Matrix and Risk Trend charts
3. **Analysis:** includes a Risk-Adjusted Schedule, Summary of risk analysis results, Cost and Cash flow analysis results, Risk Chart, Success rate and Crucial Tasks
4. **Tracking:** includes a Tracking Gantt Chart and linear Tracking Chart
5. **Reporting:** includes various hard-coded and customizable Risk Reports

Each step has multiple views which are used to enter data or to present the result of analysis. The views are shown in two places: in the ribbon the top and in the workflow bar on the left.

You can open and close multiple project schedules during one session in RiskyProject.



Application Look

You may change the color and style of title bars, toolbars, and status bars, as well as change the theme for the datasheets. The theme is used for any grid including grids inside dialog boxes. Before changing the application look, close all active projects. After you have changed the application look, restart RiskyProject to enable the changes.

To change the application look

1. Click the **Tools** tab.
2. In the **Resources and Settings** group, click **Application Look**.

Customizing Workflow Bar

You may enable and disable views from the Workflow bar. By default some views, including Assign Mitigation and Risk Status are disabled.

To customize Workflow Bar:

1. Click the **Tools** tab.
2. In the **Resources and Settings** group, click **Customize Workflow**.
3. In **Enable/Disable Views from Workflow Bar** dialog select views phases you wish to Enable or Disable.

You can also right click on Workflow bar to be presented with the same dialog.

RiskyProject Data Sheets

All RiskyProject views, except for the Project Summary view and Risk and Project Dashboards contain data sheets. Data sheets are used to enter and present data in a grid format. Grids are also used in some dialog boxes. All data sheets have similar features.

Data sheets are used to display task information, resources, risks, and results of sensitivity analysis. Data sheets are composed of columns and rows. Each column has specific properties, which represent a specific data type. For example, resource name, resource type, etc. You can customize data sheets to display the columns in any order and any with a title in the column header. See the appendix for a full description of each field.

Modifying data sheets

You can modify all the RiskyProject views by inserting, modifying, or hiding columns depending on the type of information you want to view.

1. Open a view and right-click on a column header.
2. From the shortcut menu, choose how you want to modify the column:
 - Hide
 - Insert Column Before or After
 - Modify: Change field type, Title, Title and Data alignment, Width
 - Save Column Layout: current column layout will be saved in the registry for all new projects



-
- This modification is saved in the RiskyProject data file associated with the particular project. Therefore, the next time you open the project, you will see your column modifications. This way you can create a customized data sheet for each view.
 - Modifications to data sheets are specific to each view. For example, if you insert a column into the Project View, it will not be reflected in Result Gantt View.
 - You cannot hide or modify IDs.

- In the Risk Register view, you can extend the height of rows, add headers that span multiple columns above regular columns and adjust the width of columns based on maximum width of information contained.

Copying, cutting and pasting selected rows

You can copy, cut, and paste selected items in each data sheet except for the results of sensitivity analysis.

1. Select one or multiple rows in a data sheet.
2. Click the **Schedule** tab. In the **Clipboard** group, click **Cut** or **Copy**.
3. Open the data sheet in which you want to paste the data.
4. Select the row in which you want to paste the data.
5. Right-click and click **Paste**.




- The maximum number of rows in RiskyProject is 20,000. You cannot paste items beyond this limit. However, if you import a project from other project management software, the maximum number of tasks will be increased so it can accommodate all tasks in the original project schedule.
- You can paste data *only* to compatible data sheets (e.g. tasks can be pasted to the data sheets containing tasks, and risks can be pasted to data sheets containing risks).
- You cannot paste data copied or cut from another document with the exception of risks.

Inserting and deleting items

You can delete and insert items from, or to, any data sheet except for the results of sensitivity analysis. The quickest way to insert or delete items is to use the Insert and Delete buttons located on the Format toolbar.

To insert items:

1. Select an item or multiple items. New items will be inserted above the uppermost selected item. The number of items to be inserted equals the number items you have selected.
2. Click the **Schedule** tab. In the **Format** group, click the **Insert Item**  button.

You can also use right-click on the left column in each data sheet that displays IDs, and use the dropdown menu to insert and delete selected items.

Saving column layout

After you modify a column layout, you can save it in the system registry for all new projects created on your computer. You save a column layout by following these steps:

1. Go to **Schedule** and Click on **Project Options** in Settings and Options Group
2. Go to **View** tab
3. Click on **Set Default Column Layout**
4. You can restore the predefined layout of columns for all views by clicking on **Restore Default Column Layout**

Alternatively, you can right-click on any column and click **Save Column Layout** from the drop-down menu.

Chapter 2: Qualitative Risk Analysis and Management

Risks in RiskyProject

Risk Register

The Risk Register is a set of all the project risks. You can enter risks in either the **Risk Register** view:

The screenshot shows the Risk Register interface with several callout boxes:

- Click Risk Register to view risk register** (top left)
- View risks hierarchy based on the different parameters, categories, owner, manager, open/closed, etc.** (top center)
- By default, risks are ranked based on their scores. You can rank risks based on content of each column** (top right)
- Filter risks based on their properties** (left sidebar)
- Sort risks alphabetically or on risk ID** (center table)
- Click Risk Register to view risk register** (bottom left)
- You can create multiple tabs (views) for Risk Register** (bottom center)
- Each tab presents different views of Risk register** (bottom right)

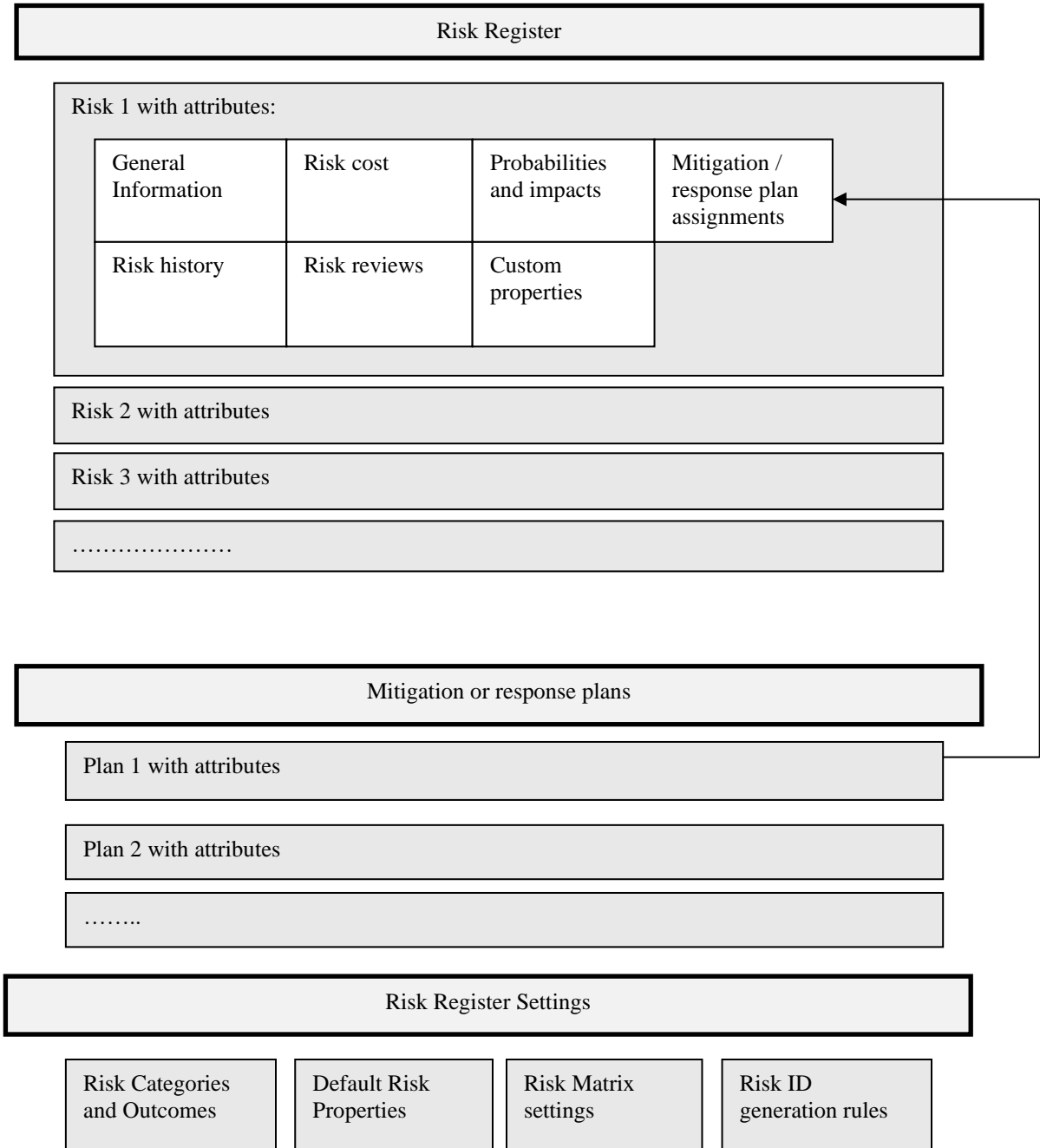
Risk Name	Open	Issue	Threat	Risk Assigned To	Pre-Mitigation			Post-Mitigation		
					Pro	Imp	Score	Pro	Imp	Score
1 Delay in Financing	Open		Threat	Task 55: Acquisition of Financ	65.0 %	60.3 %	39.2 %			
2 Not enough information about competitors	Open		Threat	Assigned to 4 tasks/resource	96.7 %	26.7 %	25.8 %			
3 Other risks, related to this project	Open		Threat	(global)	20.0 %	68.2 %	13.6 %			
4 Delay in patent and trademark search	Open		Threat	Assigned to 2 tasks/resource	38.1 %	9.92 %	3.78 %			
5 Risks affecting whole company/division	Open		Threat	(global)	4.00 %	34.6 %	1.38 %			
6 Cost information is not available	Open		Threat	Assigned to 2 tasks/resource	55.3 %	0.00 %	0.00 %			
7 Delay in getting level advice	Open	Risk	Threat	Task 29: Determine the legal	85.0 %	0.00 %	0.00 %			
8 Lack of knowledge of the specific area	Open	Risk	Threat	All resources (global)	9.00 %	0.00 %	0.00 %			
9 Not enough data to analyze demand level	Open	Risk	Threat	Assigned to 2 tasks/resource	86.1 %	0.00 %	0.00 %			
10 Not enough data to plan management of demand	Open	Risk	Threat	Task 23: How will you manag	20.0 %	0.00 %	0.00 %			
11 Problem with hiring	Open	Risk	Threat	Task 58: Hiring of key employ	15.0 %	0.00 %	0.00 %			
12 Selected name is taken	Open	Risk	Threat	Task 28: Establish Name and	30.0 %	0.00 %	0.00 %			
					10.0 %	0.00 %	0.00 %			

Use the Risk Register to:

1. View risks with their attributes such as probabilities, impacts, scores, and properties.
2. Create a risk register hierarchy based on:
 - Risk categories
 - Open/Closed risks
 - Risk/Issues/Lessons Learned
 - Risks assigned to managers
 - Risks assigned to owners
 - Threat mitigation or opportunity mitigation strategies
 - Assigned/Unassigned Risks (active or inactive)
 - Hidden and Visible risks (available in RiskyProject Enterprise only, see *RiskyProject Enterprise User Guide*)
3. Rank risks based on risk score.
4. Sort risks alphabetically or using risk IDs.

5. Filter risks based on risk properties: Open, Closed, Risk, Issue, or Lessons Learned.

Data for the Risk Register can be subdivided into three categories: risk registry, risk mitigation/response plans, and settings:

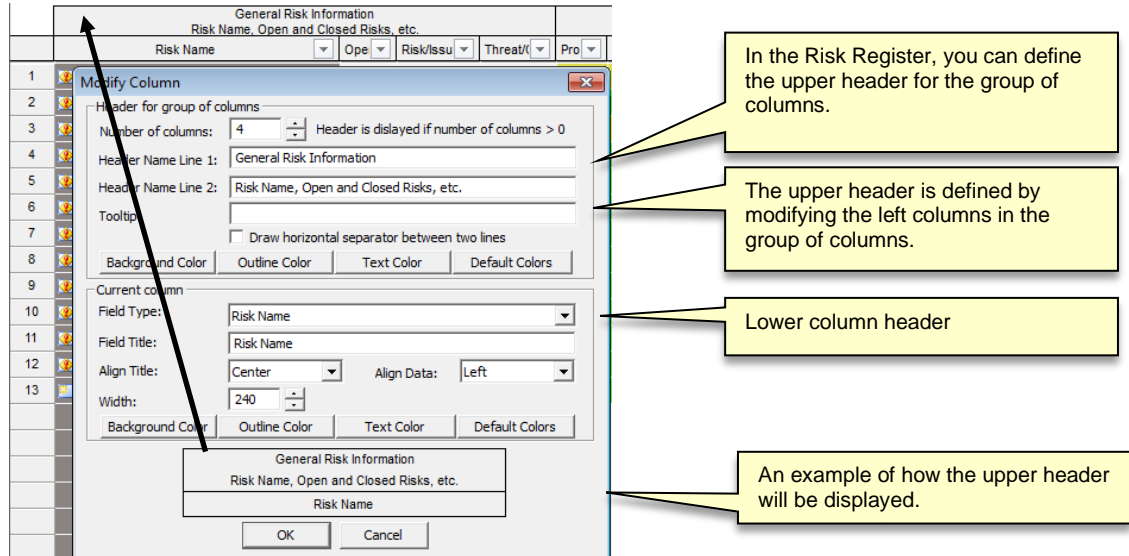


Defining columns for Risk Register

You can modify the Risk Register by inserting, modifying or hiding columns depending on the type of information you would like to view. The Risk Register view allows you to define the upper header for the group of columns. The upper header can have two rows of text and a tooltip.

It can have different background colors, outline colors and text colors. There are two pre-defined upper headers: Pre-mitigation and Post-mitigation.

1. Open the Risk Register and right-click on a column header.
2. From the shortcut menu, choose how you want to modify the column:
 - Hide
 - Insert Column Before or After
 - Modify: field type, field title, title and data alignment, width, upper and lower headers text and color, and number of columns in the group with the same upper header.



Adding risks to the Risk Register

1. Click the **Risks** tab. On the **Risk Views** group, click the **Risk Register**.
2. On the Risk Register, click an empty row.
3. Enter a unique name for the risk. The risk is now added to the register.

Deleting risks from the Risk Register

1. Click the **Risks** tab. On the **Schedule Views** group, click the **Risk Register**.
2. Select the risk you want to delete. You can select a single risk or multiple risks.
3. Right-click on the Risk ID and choose **Delete Risk** from the shortcut menu.

Updating risk properties for individual risks

To modify the risk properties using the Risk Register:

1. Open the Risk Register.
2. Click on the risk properties and make desired changes.

Updating risk properties for a group of risks

You can define the same risk properties for a group of risks at the same time.

1. Open the Risk Register.

2. Select the risks to which you would like to add properties.
3. Right-click on the risk **ID** and select **Risk Properties**.
4. For each property, add a value as required. If properties are different for the selected risks, you will be shown with *****.

Filtering and sorting risks using the Risk Register

The Risk Register offers powerful tools for filtering and sorting risks:

- Filter and sort the Risk Register based on the content of each column. To filter or sort, click on the box with the arrow to the right of the column name. The Sort dialog box opens. You can sort the alphabetically or select risks with certain property values, e.g. show only open or closed risks.

The screenshot shows the Risk Register table with columns: Risk Name, Op, Risk/issu, Threat, Pro, Imp, Sc, and Score. A 'Sort' dialog box is open over the 'Threat' column, showing options for 'Sort A to Z', 'Sort Z to A', and 'Disable Sort'. Below these are checkboxes for 'Select All', 'Closed', and 'Open'. The table data is as follows:

	Risk Name	Op	Risk/issu	Threat	Pro	Imp	Sc	Score
1	Delay in Financial		Risk	Threat	65.0%	59.9%	38.9%	
2	Not enough information		Risk	Threat	96.7%	26.3%	25.5%	
3	Other risks, relationships		Risk	Threat	20.0%	67.8%	13.6%	
4	Delay in patent		Risk	Threat	38.1%	9.9%	3.8%	
5	Risks affecting		Risk	Threat	4.0%	34.4%	1.4%	
6	Cost information		Risk	Threat	55.3%	0.0%	0.0%	
7	Delay in getting		Risk	Threat	85.0%	0.0%	0.0%	
8	Lack of knowledge		Risk	Threat	9.0%	0.0%	0.0%	
9	Not enough data		Risk	Threat	86.1%	0.0%	0.0%	
10	Not enough data		Risk	Threat	20.0%	0.0%	0.0%	
11	Problem with history		Risk	Threat	15.0%	0.0%	0.0%	
12	Selected name		Risk	Threat	30.0%	0.0%	0.0%	
13	Staff turnover	Closed	Risk	Threat	0.0%	0.0%	0.0%	

Callout boxes provide additional context:

- Left callout: "Click here to sort Risk Register based on content of this column. You can select risks with certain property values"
- Right callout: "This icon shows that Risk Register is sorted based on content of this column."

- Find a risk based on the actual value of a risk property using the Find Risk dialog (Filter button) at the bottom of the Risk Register. You may combine different risk properties using AND or OR.
- Sort the risk register alphabetically using and buttons or based on pre-mitigation risk score using the button. You may also sort the Risk Register based on Risk ID.

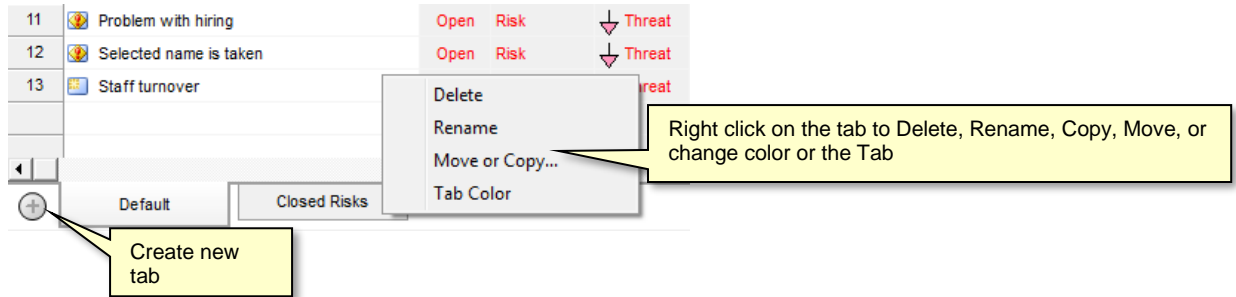
You can filter risks that affect different risk categories. Risks can affect:

- duration
- finish time
- cost
- success rate
- non-schedule risk categories.

RiskyProject calculates the combined impact of risk on all risk categories. Pre-mitigation and post-mitigation risk impact, probability and score are displayed for selected risk categories.

Use tabs to create multiple views of Risk Register

You can create multiple tabs to create different views of the Risk Register. These tabs are shown at the bottom of risk register. Each view may have different set of columns, different headers, or different sorting and filtering settings. For example, in one tab you can show risk names and description sorted alphabetically. In another tab, you can show risk probabilities, impacts, and scored sorted based on risk score. This way you can easily switch between different views of the risk properties. In addition, these views can be used to generate multiple risk register reports.



The Risk Register tab settings are saved for each project. You can also save the current tab settings as the default for all new projects:

- Right-click on any header
- Click on **Save Column Layout**



- With the Risk Register views you can rename risks and copy risk information to the clipboard. You may also copy and paste risks inside the Risk Register.
- You can export the complete risk register or selected risks to Excel by click on **File > Export > Microsoft Excel**

About Risk Categories, Probabilities and Impacts

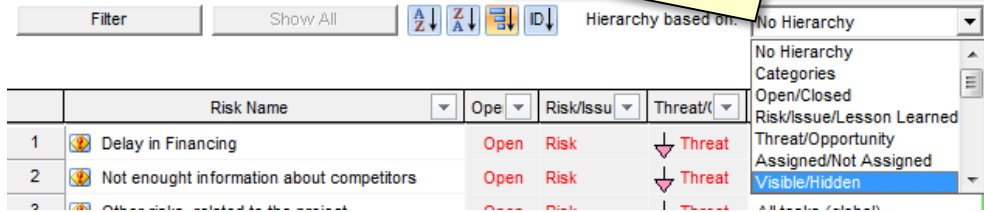
Risk Categories

Risk Categories are a group of risk outcomes. RiskyProject calculates risk probabilities, impacts and scores for each category. The default risk categories are:

- Duration
- Cost
- Safety
- Environment
- Legal
- Performance
- Technology

RiskyProject calculates the score and rank for all risks in each risk category. You can view risk scores and rankings for each risk category or for all categories.

In the Risk Register, Risk Matrix, and Risk Report you can view risks associated with a specific risk category



You can customize the risk categories in the Risk Categories dialog box. For more information about customizing risk categories, read “Managing Risk Categories and Outcomes”.

Risk Outcome Types

A Risk Outcome Type is the result if a risk occurs. While every risk category must have a least one outcome, they can have several. For example, one of the default risk categories is Legal. You may want to further define the outcome types as Litigation Risk, International Legal Risk, etc.

You can customize the set of outcome types using the Risk Categories dialog box.



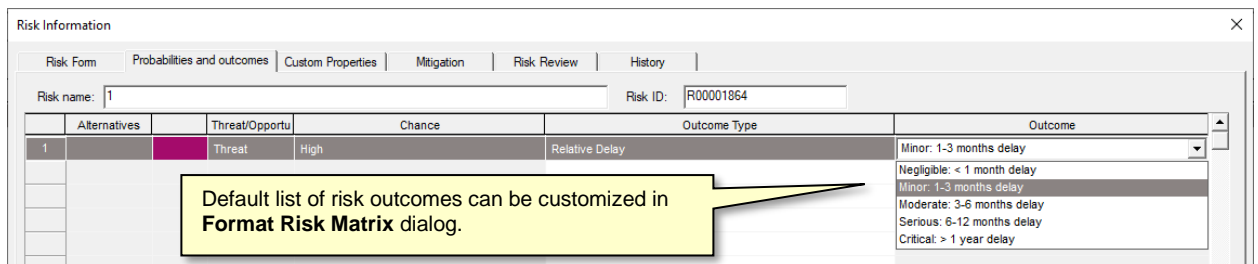
The set of risk outcome types are different for qualitative and quantitative risk analysis. For quantitative risk analysis, RiskyProject automatically adds a number of schedule-specific risk outcomes, such as restart task, fixed cost increase, etc.

Risk Probability and Chance

Risk Probability is the calculated chance that an event will occur. You can view risk probability in the **Risk Matrix**, **Risk Register**, and other views and dialog boxes. Risk Chance is the input parameter for risk probability. Risk chance (input parameter) and risk probability (calculated attribute) can be different; particularly when a risk has multiple mutually exclusive alternatives as risk, chance is an input parameter for each alternative. In these cases, Risk probability is calculated based on the risk chance for each mutually exclusive alternative.

Risk Outcome

Risk Outcomes indicate the severity of a risk event for the specific risk category. You need to enter risk outcomes when you define risk chance and outcome type. For example, here are the default risk outcomes for the risk category **Schedule**:



Outcome types can be a label (e.g. Critical > 1 year delay) or a percentage (e.g. 5%), or a combination of both. You can set how you want to enter and view risk outcomes in the **Format**

Risk Matrix dialog box. Each label is associated with percentage, which is the midpoint of the interval for each label:

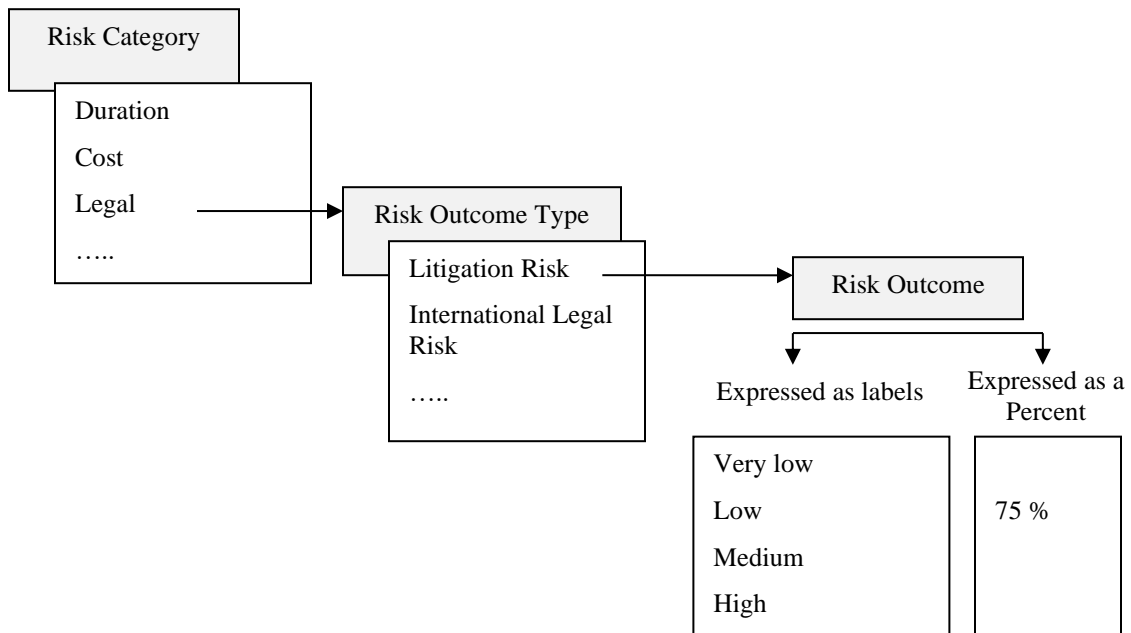
Label	Interval	Midpoint
Negligible: < 1 month delay	From 0% to 20%	10%
Minor: 1-3 month delay	From 20% to 40%	30%
Moderate: 3-6 months delay	From 40% to 60%	50%
Serious: 6-12 months delay	From 60% to 80%	70%
Critical: > 1 year delay	From 80% to 100%	90%

When you define outcome types as a percentage, you can enter it as any number from 0% to 100%. In this scenario, it will be associated with a label based on the interval to which this percentage belongs. For example, 76%, corresponds with the “Serious: 6-12 months delay” outcome type.



In RiskyProject, risk outcome types can be probabilistic. You can define a statistical distribution for outcome types and perform Monte Carlo simulation even it is part of qualitative risk analysis. For more information about probabilistic risk outcome types, read “Uncertainties in Risk Outcomes”.

The diagram below shows the relationship between risk categories, risk outcome types, and risk outcomes.



Mutually exclusive alternatives

Mutually exclusive alternatives are used to calculate alternate outcome types for the same risk event that cannot occur at the same time. An alternative risk is similar to using a Boolean “OR” statement. Only one risk alternative can occur at the same time. For example, if you have a fire risk, the fire could be minor or major each with different outcomes. They are the same risk, but unlike other risk events, these alternatives cannot occur at the same time.

In this example, the risk Fire has two alternatives:

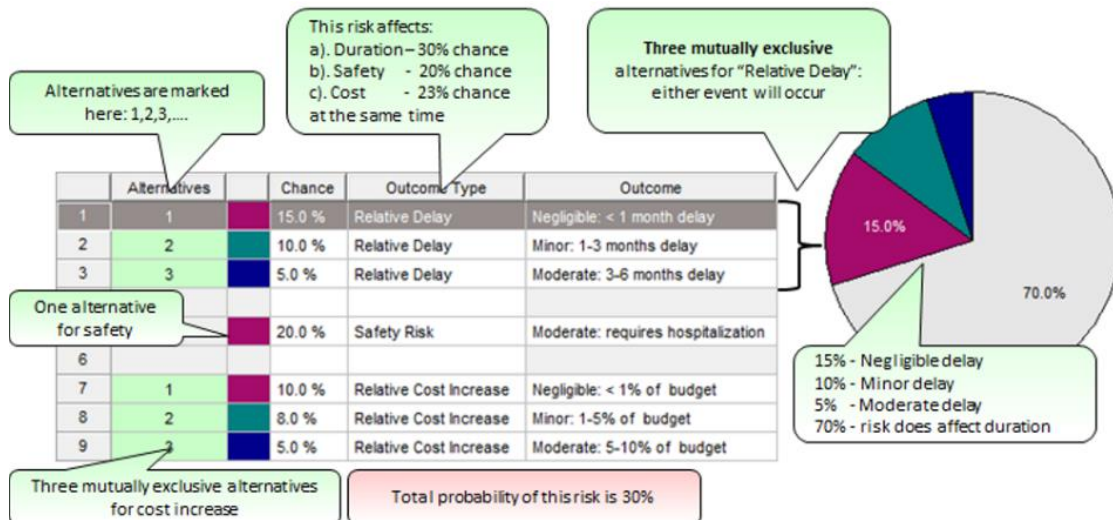
Chance	Outcome Type	Outcome
10%	Relative delay	Negligible: < 1 month
2%	Relative delay	Low: < 1-3 months

When the simulations are run, there is a 12% chance that the risk Fire will occur. 10% of the time the outcome of the minor fire will be calculated, while 2% of the time the outcome of a major fire is calculated, but they are never calculated during the same simulation.

Mutually exclusive alternatives must:

- have the same name,
- not be separated by empty rows, and
- belong to the same category. For example, if you have the same risk “Change in requirements” with outcomes Reduce Quality and Fixed Delay, these outcomes will not be mutually exclusive alternatives as they are different risk categories that have different impacts.

The diagram below illustrates how mutually exclusive alternatives are assigned:



Threats and Opportunities

Risks can be threats, opportunities or both. Threats and opportunities are defined for risk assignment depending on results of the risk outcome. Negative risk outcomes mean opportunities.

Example 1:

risk: Change Requirements

Outcome: Fixed Delay

Result: 2 days

This is a threat

Example 2:

risk: Change of technology

Outcome: Delay in technology introduction

Result: -10% Low

This is an opportunity: a negative number indicates that this is acceleration rather than a delay of the technology introduction

Example 3:

risk: Chance of supplier

Outcome: fixed cost increase

Result for mutually exclusive alternative 1: \$30,000

Result for mutually exclusive alternative 2: -\$20,000

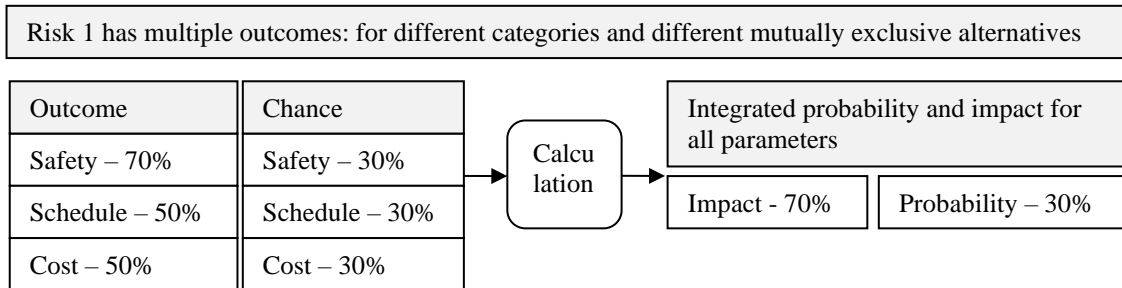
This is both a threat and an opportunity depending upon the supplier.

You can have different sets of labels for threats and opportunities for a risk category. For example, for the risk category Schedule, a threat outcome type can be “Critical > 1 year delay”, for an opportunity it can be “Critical > 1 year acceleration”. If you want to enter opportunities, you need to enter a negative percentage (e.g. -25%) as the outcome type.

Risk Impact

Risk impact is the calculated result of the risk event. Risk outcome (input parameter) and risk impact (calculated attribute) can be different, particularly when a risk has multiple mutually exclusive alternatives, in which case the risk outcome is a parameter of each alternative. Risk impact is calculated based on the risk chance for each alternative.

The diagram below shows the difference between risk chances and outcomes (input parameters) and risk probabilities and impacts (output parameters):



Risk Score

Risk score is a calculated parameter that equals probability multiplied by impact. Risk score is calculated for each risk category as well as all risk categories.

Original, Pre-, and Post-Mitigation Probabilities, Impacts and Scores

RiskyProject calculates three sets of probabilities, impacts and scores for each risk category as well as combined for all categories. You can view these sets in the Risk Register, Mitigation Assignment View, and Mitigation tab of Risk Information Dialog.

1. **Original:** when risk chance and outcome are defined. This information can be entered in the list of risk mitigation plans in Mitigation tab of Risk Information Dialog. Original chance, outcome and scores can be shown in the Risk Register as **read-only**. RiskyProject can only save one set of original chance, impact, and score per risk.

Risk Register

reat/C	Original			Current (Pre-Mitigation)			Cost (Pre)	Cost (M)	Probabil
	Probab	Impact	Score	Probal	Impa	Score (f)			
Threat	5	5	25	5	5	25	\$0.00	\$0.00	1
Th	4	4	16	4	4	16	\$0.00	\$0.00	1

Modify Column

Header for group of columns: _____
 Number of columns: 0 Header is displayed if number of columns > 0
 Header Name Line 1: _____
 Header Name Line 2: _____
 Tooltip: _____
 Draw horizontal separator between two lines

Background Color: _____ Outline Color: _____ Text Color: _____ Default Colors: _____

Current column: _____
 Field Type: Score: Original
 Field Title: Score: Original
 Align Title: _____
 Width: _____
 Background Color: _____

Score: Original
 Score: Performance
 Score: Performance, Post-Mit
 Score: Post-Mitigation
 Score: Pre-Mitigation (Current)
 Score: Quality
 Score: Quality, Post-Mit
 Score: Safety
 Score: Safety, Post-Mit
 Score: Schedule
 Score: Schedule, Post-Mit
 Score: Technology
 Score: Technology, Post-Mit

Risk Information

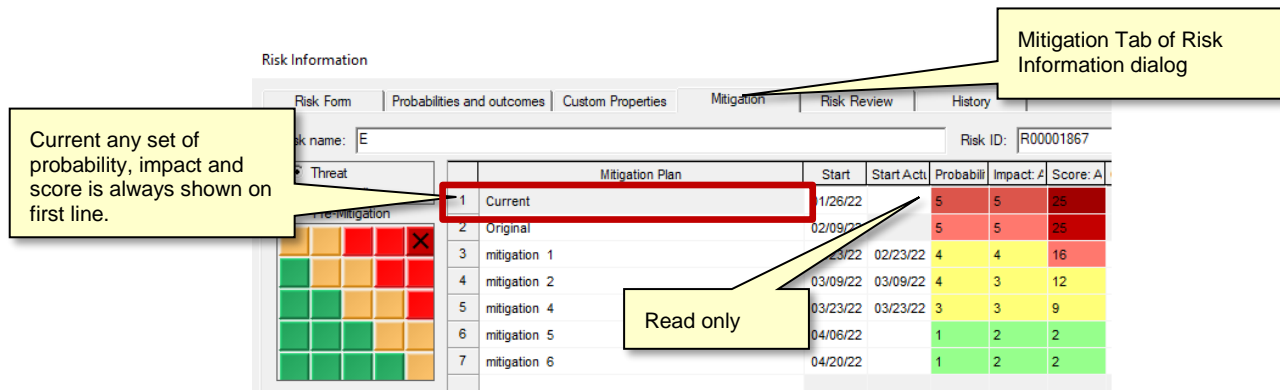
Risk name: E Risk ID: R00001867

Threat/Opportunity	Mitigation Plan	Start	Start Act.	Probabili	Impact: A	Score: A
1	Current	01/26/22		5	5	25
2	Original	02/09/22		5	5	25
3	mitigation 1	02/23/22	02/23/22	4	4	16
4	mitigation 2	03/09/22	03/09/22	4	3	12
5	mitigation	03/23/22	03/23/22	3	3	9
6	mitigation	4/06/22		1	2	2
7	mitigation	4/20/22		1	2	2

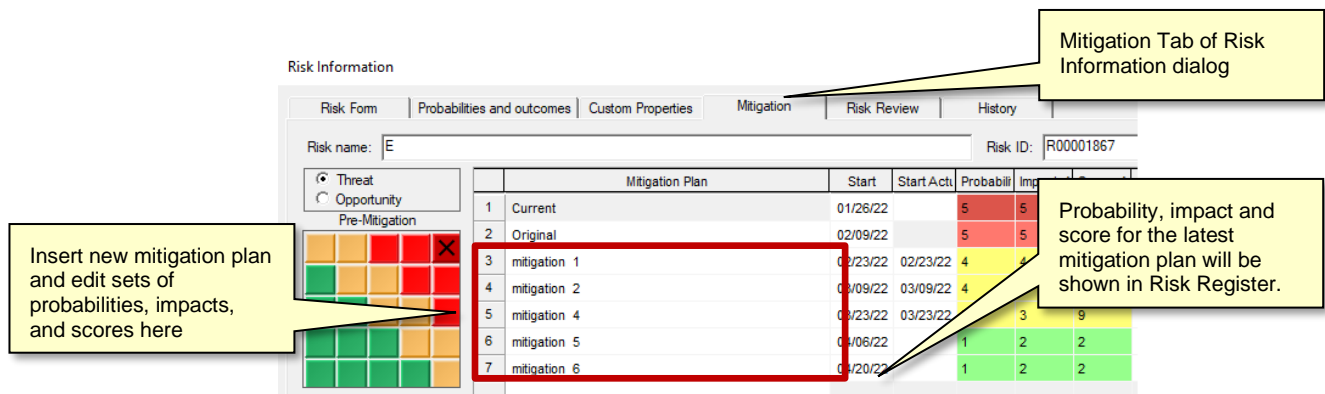
Callouts:

- Right click on column's header to insert new or modify existing column.
- Add Column for Original Chance, Impact or Score. They will be **Read Only** in Risk Register. These columns are hidden by default.
- Mitigation Tab of Risk Information dialog
- You can designate any set of chance, impact and score as Original.
- Enter risk chance, impacts, and scores for Original set here.

2. **Current:** reflects most recent changes to probability and impact for each category. If you use qualitative analysis, current chances and impacts are **editable** in Risk Register. You can also edit them in the **Risk Form** or the **Probabilities and Outcomes** tab of the **Risk Information** dialog box. For quantitative analysis (with project schedule) current set of probability, impact, and scores is calculated based on risk assignment to task or resources. Current set of probability, impact, and score is shown as a first line on Mitigation Tab on Risk Information dialog box.



3. **Post-Mitigation:** Post-mitigation probability, impact and score reflect changes to risks due to mitigation plans. There can be many mitigation plans assigned to one risk. They are editable in the **Assign Mitigation** view and in **Mitigation** tab of the **Risk Information** dialog box. In the **Risk Register** you can show the latest read-only probability, impact and score, which corresponds to the last line in **Mitigation** tab. In the **Assign Mitigation** view, in addition to editing the post-mitigation probabilities, impacts and scores for all categories, you can also edit values for individual categories, such as cost, duration, quality, technology, etc. Probabilities, impacts and scores for individual categories are not used to calculate combined probabilities, impacts and scores, which should be entered independently. Post-mitigation probabilities, impacts and scores are not affected by quantitative analysis. Also in the **Assign Mitigation** you can enter both predicted and actual probabilities, impacts and scores.



Risk Properties

Risk Properties are other risk attributes, which include:

- Risk Name, ID, description, statement, objectives, assumption, cause and trigger
- Open/close risk
- Risk life cycle status: Risks, issues, lesson learned
- Risk ownership
- Risk mitigation strategy
- Risk costs
- Risk start and end date
- Other information about risk

Some risk properties are predefined as General Information about risk and Risk Costs. However, you may define any other risk properties.

Risk Mitigation and Response Plans

You can model risk mitigation or response efforts in RiskyProject using the **Mitigation or Response View**. Response plans are activities that are executed when a risk occurs and are used for quantitative risk analysis. Mitigation plans are actions that are performed to minimize risk probability and/or impact and can be visualized using the Risk Mitigation Waterfall diagram

A mitigation or/and response plan must be assigned to a particular risk. Please read “Assigning Risk Response Plans” and “Assigning Mitigation Plans” for more information.

Creating a mitigation or risk response plan

1. Click the **Risks** tab. In the **Risk Views** group, click **Mitigation/ Response Plans**.
2. Enter the mitigation or response plan name. Summary entries will help you to organize information, but they are not considered a mitigation plan.
3. Select either **Mitigation** or **Response** plan
4. For Response plans, enter an **Outcome Type** and **Outcome** of the response. The outcome types are automatically populated based on the list of outcome types.
5. Enter the **Cost** of the mitigation or response plan
6. For Mitigation plans, enter the default reduction of probability and impact if the mitigation plan is assigned to the risk.
For example, a mitigation plan reduces probability on 5% and impact on 10%. If a mitigation plan is assigned to the risk that has 45% probability and 30% impact before mitigation, the risk will have 40% probability and 20% impact after mitigation.
7. Enter the mitigation or response plan description. If you double-click on a mitigation/response plan ID, the **Mitigation or Response Plan Description** dialog box will open.



A mitigation or response plan can be assigned to multiple risks. The cost of mitigation or response plans will be included with each risk.

You can use multiple text and number properties in mitigation and response plans to enter additional information. These fields can be accessed by inserting column Text1, Text2, Text3, and Number1, Number2, Number 3, ... to the Mitigation and Reponse View.

Creating Summary and Sub-plans

Mitigation plans can be composed of Summary plans with associated sub-plans. This can be very useful if your mitigation plans have several activities or steps that have distinct costs and outcomes that you want to monitor items separately.

Summary plans have names only and do not have Plan Type, Outcome Type etc. Summary and sub-plans are defined using the Indent and Outdent commands similar to Summary and Subtasks on the Gantt Chart.

To create a sub-plan:

1. Enter a name for the **Summary** plan.

2. Click the row below the plan
3. Enter a name for the plan.
4. Right-click on the plan and on the shortcut menu click **Indent**. The plan now becomes a sub-plan of the mitigation plan.
5. Enter information for the sub-plan.

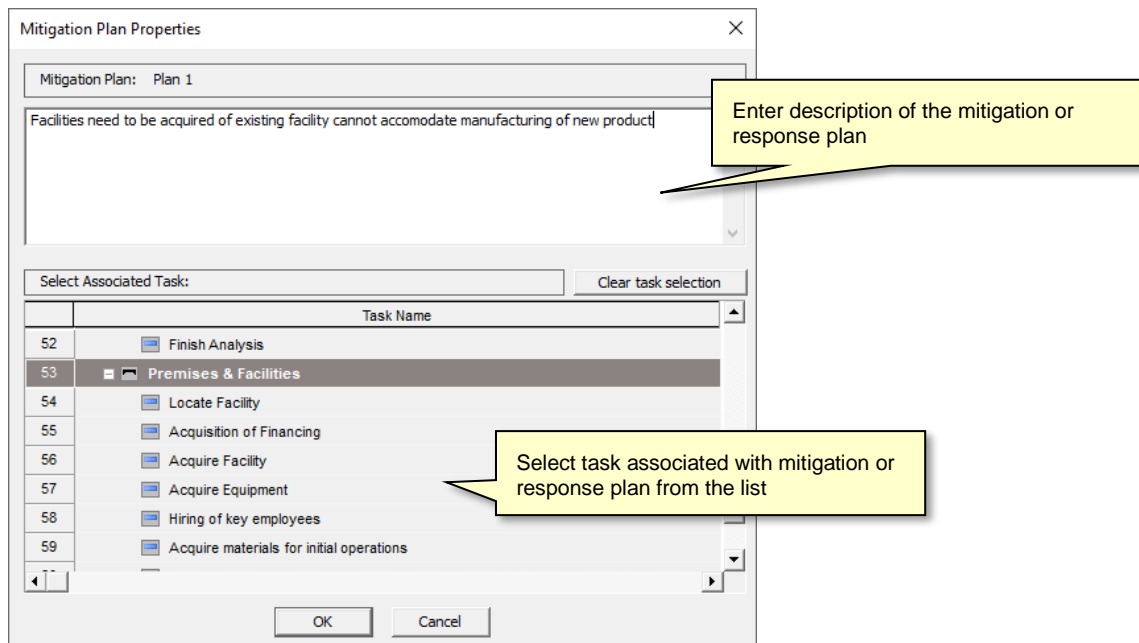
Assign Tasks to Mitigation or Response Plan

As part of mitigation planning, tasks that represent mitigation activities with planned finish times and costs are added to a plan. You assign these activities, including summary tasks, to a mitigation or response plan. In this case cost, actual cost and percent completed of the plan will be calculated based on costs and percent completed of the task. If Monte Carlo simulations are conducted, the cost of a mitigation plan will equal the mean of the task cost. If simulations are not conducted, the cost of a plan equals the original (deterministic) task cost.

The dates of mitigation plan execution shown in Mitigation tab of task information dialog are not associated with the task and should be defined by user. The task associated with mitigation plans will be shown in the risk report. If the plan is associated with a task cost, actual cost, and percent completed of the plan is read only.

To assign a task to a mitigation or response plan:

1. Double click on the Mitigation or Response plan id; the Mitigation or Response Plan dialog box opens.
2. From the list of tasks, select the task that you want to link to the plan. Only one task can be selected.
3. To reset selection of the task, click **Clear task selection**.



Risk Attributes

About Risks

Each risk in RiskyProject can have a number of properties. Common properties are predefined and are found in the **Risk Form** or **Custom Properties** tabs of the **Risk Information** dialog box. The Risk Form is fully customizable: you can define a set of mandatory and optional attributes, which need to be entered as part of your risk management process.

Risk properties include:

- **Risk Name:** the risk name for each risk must be unique. Names are case-sensitive.
- **Open/closed risk:** open risks are active risks that may occur. Closed risks are those risks that are no longer active because of risk response or other factors or measures taken. Closed risks may contain important information and should not be deleted from the risk register.
- **Risks, issues, lessons learned:** risks are events that may or may not occur and have a probability between 0 – 100%. Issues are events that have already occurred and require a response. Lessons learned are events that occurred in the past and have a history associated with them. When you add a new record to the risk register, by default it is a risk.
- **Risk statement, objectives, assumption, cause and trigger:** contain textual information about risks.
- **Risk ownership:** includes risk manager and risk owner. You may define other custom fields for risk reviewer, recorder, and other participants in the risk management process.
- **Risk mitigation strategy:** you can enter mitigation strategies for threats and/or opportunities. Status of threats and/or opportunities are automatically calculated when you enter risk probabilities and impacts. If the risk is only a threat, you will only be able to enter strategies for threats and vice versa. For more information about threats and opportunities, read “Risk Probabilities and Impacts”.
- **Risk start and end date (risk sunrise and sunset):** dates between which a particular risk is active.
- **Risk ID:** Risk ID can be automatically generated when you create a new risk. You may sort the Risk Register based on Risk IDs. You can overwrite the automatically generated risk ID. Rules for risk ID generation are defined in **Risk Options**. To view Risk Options, click the **Schedule** tab. In the **Settings** group, click **Options**.



- You can create any other risk properties using **Default Risk Properties** dialog box (**Risk** tab of the ribbon, **Settings** pane). In this dialog you can also define the default risk mitigation strategy and default time between risk sunrise and sunset.
- In the case of quantitative risk analysis, changing a risk from **Open** to **Closed**, from **Risk** to **Issue** or **Lesson Learned** will affect risk probability and impact. For more information about this please read “Assigning Risks to Task and Resources”.

Risk Probabilities and Impacts

There are two ways probabilities and impacts can be defined in RiskyProject:

- You can define chance and outcome for each risk in the Probabilities and Outcomes tab of the Risk Information dialog box.
- You can also define risk chance and outcome directly in the Risk Register grid. However, in this case, risk cannot be assigned to any tasks or resources. If risk is already assigned to at least one task or resource, you will not be able to modify chance and outcome using the grid and the Risk Information dialog box will appear. This method is preferable for qualitative risk analysis and risk management.

Defining risk chances and outcomes in the Risk Information dialog box

You must enter the risk chance, outcome type, and outcome for each risk. You may only define one alternative. Please remember that risk chance and outcome may not be equal to calculated risk probabilities and impacts in the following cases:

- For risks with multiple mutually exclusive alternatives
- If you define uncertainties in risk outcome
- In case of quantitative risk analysis (with project schedule)

To define risk chances and outcomes in the Risk Information dialog:

1. Click the **Risk** tab. In the **Risk Views** group, click **Risk Register**.
2. Double-click on a risk ID to open the **Risk information** dialog box.
3. Click the **Probabilities and Outcome** tab.
4. Enter **Chance** that will be used to calculate probability.
5. Select **Outcome Type** from dropdown list.
6. Select **Outcome** label from dropdown list or enter percent.
7. Threat/Opportunity are calculated automatically if you enter a negative outcome.
8. If required, repeat steps 5 -7 for each mutually exclusive alternative.



Use the **Format Risk Matrix** dialog box to toggle between entering risk outcomes as labels, percentages, or both.

Defining risk chances and outcomes in the Risk Register grid

By default, the Risk Register's columns do not allow you to enter risk chance and outcome directly. You need to define appropriate columns first:

1. Within **Risk, Register** view, right-click on the header of the column next to which you want to define that column in order to enter chances and outcomes.
2. Click on **Insert Column Before** or **Insert Column After**.
3. Select field from the **Field Type** dropdown list. Here is the list of columns which can be presented in the Risk Register:

Field	Description	Read Only or Editable in Risk Register View
Impact Original	Impact of risk designated by user as Original	Read Only, defined in Mitigation Tab of Risk Information Dialog
Impact Current (Pre-mitigation)	Calculated risk impact for all categories based on impact of individual risk categories	Read Only, defined in Risk Form or Probabilities and Impacts tab of Risk Information Dialog for individual categories or calculated as a result of quantitative analysis
Impact Post-mitigation	Last line in Mitigation Tab of Risk Information Dialog or in Assign Mitigation view for individual risk	Read Only, defined in Mitigation Tab of Risk Information Dialog or in Assign Mitigation view
Impact: Cost	Current Impact: Cost Category	Editable. Defined in Risk Register or in Risk Information Dialog
Impact: Cost, Post-mitigation	Last line in Mitigation Tab of Risk Information Dialog or in Assign Mitigation view for individual risk related to cost category	Read Only, defined in Mitigation Tab of Risk Information Dialog or in Assign Mitigation view
Impact: Environment	Current Impact: Environment Category	Defined in Risk Register or in Risk Information Dialog
Impact: Environment, Post-mitigation	Last line in Mitigation Tab of Risk Information Dialog or in Assign Mitigation view for individual risk related to Environment category	Read Only, defined in Mitigation Tab of Risk Information Dialog or in Assign Mitigation view
Impact:	Current and post mitigation impacts for other risk categories	Defined in Risk Register or in Risk Information Dialog

Columns for Chance (Probability) and Score are defined the same way. After you define appropriate columns, they can then be used to enter the risk chance and outcome for each category.

Selecting probability/impact/score columns for Risk Register

The screenshot shows the 'Insert Column Before' dialog box with the following fields:

- Header for group of columns
- Number of columns: 0
- Header is displayed if number of columns > 0
- Header Name Line 1: []
- Header Name Line 2: []
- Tooltip: []
- Draw horizontal separator between two lines []
- Color []
- Text Color []
- Default Colors []

The 'Calculated Results: Pre-Mitigation' table shows columns for Proba, Impac, and Score. A callout points to the 'Impac' column with the text: "Impact (Post-Mitigation and Pre-Mitigation): Calculated Impact for all categories - Read only".

Another callout points to the 'Impact (Original)' field in the dialog box with the text: "Impact (Original): First impact value, which was entered for this risk - Read only".

A third callout points to the 'Impact: Performance' field in the dialog box with the text: "Impact (for each category): Current Impact value for individual category: Editable - pre-mitigation, read-only for post mitigation".

Risk Form: Defining Information About Risks

The Risk Form is part of the Risk Information dialog and is used to define risk attributes. You can customize the Risk Form to create any set to risk attributes which can be entered or edited.

Risk Form has two modes:

1. **Editing Mode:** you can drag and drop different controls to Risk Form and assign properties to them. Controls such as edit boxes, drop down list, frames or static text can be selected from the left side of the Risk Form dialog box and dropped on the form. After this you need to select risk attributes associated with the control from the list of available attributes. For a **Static Text** box you the enter text to be displayed, there are no risk attributes associated with the frame.
2. **Published Mode:** when you complete design of Risk Form, click “Publish Risk Form Layout” to switch to Published Mode. In Published Mode you can no longer edit Risk Form layout, but you can enter risk attributes data. List of controls will be hidden.

To edit the Risk Form (Editing Mode):

1. Click the **Risk** tab. In the Risk Views group, click **Risk Register**
2. Double- click on risk ID to open the **Risk information** dialog box
3. Go to **Risk Form** tab; default Risk Form will be presented in Published Mode
4. Go to Editing mode by clicking on **Edit Risk Form Layout**
5. Clear controls if required by clicking on **Clear All** button
6. Select control using button on the right side.
7. Click on Risk Form to select the position of the control
8. From the dropdown list above Risk Form select the property associated with selected control
9. Adjust size of the control by dragging its corners
10. Right click outside the control: shortcut menu will come up. You can Delete, Copy, or Paste control, as well as make the property Mandatory. Once in Published Mode, all mandatory fields must be filled to save data.
 - Click **Save as Default** to save newly designed Risk Form for all your new projects
 - Click **Standard Form** to restore standard if required
 - Click **Publish Risk Form Layout** to convert to Published Mode

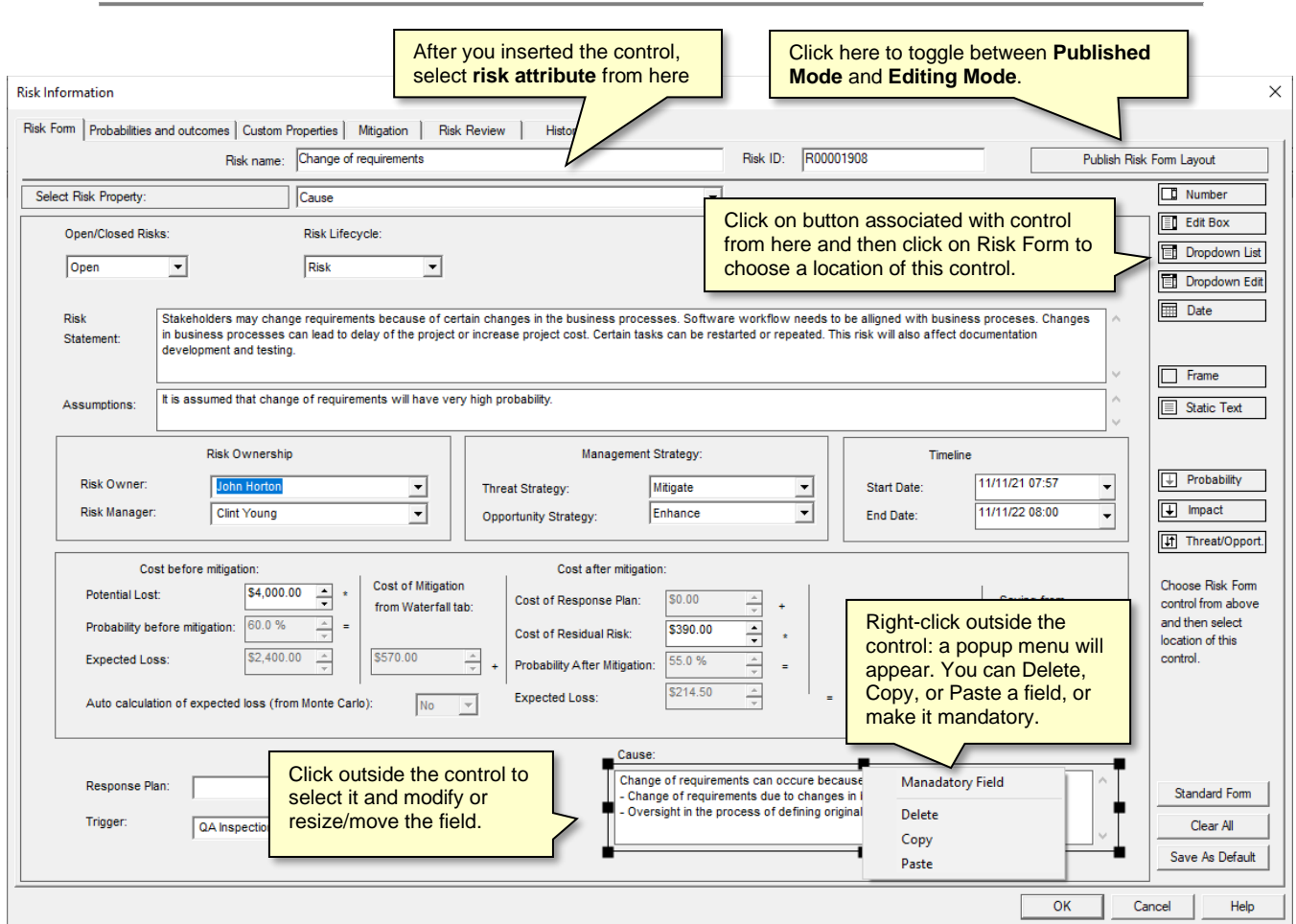
To use Risk Form (Published Mode):

1. Click the **Risk** tab. In the Risk Views group, click **Risk Register**.
2. Double- click on risk ID to open the **Risk information** dialog box.
3. Enter risk attributes to the **Risk Form**



- You can create any other risk properties using the **Default Risk Properties** dialog box (**Risk** tab of the ribbon, **Settings** pane) and include them to the Risk Form
- Some properties, such as **Expected Loss** are calculated and will be read only

- Risk Form allows you enter probability and impact of the risk. However you cannot use Risk Form to define probability and impact for risk assigned to tasks and resources and risks with mutually exclusive alternatives. Therefore it is recommended to use Risk Form to enter probability and impact for qualitative risk analysis only (when there is no schedule).



The Risk form has the following fields:

- **Number** –real numbers, integer numbers, or cost properties
- **Edit Box** –string (text) properties and organizational units
- **Dropdown List** –picklist and Yes/No Properties
- **Dropdown Edit Box** –risk, resources, and response plans
- **Date** –date properties
- **Frame** –frame or line separator; it is used to create visual separation between group of control
- **Static Text** –read only text used for prompts and annotations
- **Probability** –risk probabilities belonging to different categories
- **Impact** –risk impacts belonging to different categories
- **Threat/Opport.** –selection of threats and opportunities

About Cost of Risk Calculations

The Cost Risk calculation calculates the total cost of a risk and takes into account the risk mitigation plans linked to the risk. The Risk cost calculation is performed in the **Risk Form** tab of the **Risk Information** dialog box. The **Cost of Residual Risk** and **Potential Loss** are the only values that you can manually enter in the Risk Form. All other cost parameters are calculated. You can modify Risk Form to show or hide different fields.

Cost before mitigation:		Cost of Mitigation from Waterfall tab:		Cost after mitigation:		Total cost of risk with mitigation:		Saving from mitigation/enhancement:	
Potential Lost:	\$6,922.76	*		Cost of Response Plan:	\$0.00	+			
Probability before mitigation:	65.0 %	=		Cost of Residual Risk:	\$0.00	*			
Expected Loss:	\$4,499.79		\$0.00	Probability After Mitigation:	65.0 %	=			
Auto calculation of expected loss (from Monte Carlo):		Yes		Expected Loss:	\$0.00	=	\$0.00		\$4,499.79

Risk cost calculation

Cost Before Mitigation

1. **Potential Loss** (property “*Cost before mitigation*”): the loss in monetary terms if the risk occurs. This value can be entered manually if you select No for “*Auto calculation of expected loss (from Monte Carlo)*” or if you don’t open a schedule.

For example, for the risk “low quality component”, the potential loss is \$50,000. You would incur this cost if a low quality component were supplied.

2. If you don’t open a schedule, the **Probability Before Mitigation** value is based on the risk values entered in the **Probabilities and Outcome** tab of **Risk Information** dialog box. See **Risk Probabilities and Impacts** for more information. If you have a schedule **Probability Before Mitigation** comes from results of Monte Carlo simulations.
3. **Expected Loss** (property “*Pre-Mitigation Expected Loss*”) takes into account risk probability. It is an indicator that helps you to compare the costs of different risks. Expected loss can be calculated manually or automatically depending on selection “*Auto calculation of expected loss (from Monte Carlo)*”.
 - a. Manual calculation of Expected Loss: You can manually calculate the expected loss for individual risks by running two simulations: one with the risk open and the other with the risk closed. The difference in the total project costs is the expected cost of the risk.

$$\text{Expected loss} = \text{Potential Loss} * \text{Probability (pre-mitigation)}$$

For example, probability of risk “low quality component” equals 50%. Potential loss equals \$50,000. Expected loss will be \$25,000 = \$50,000 * 50%.

- b. Automatic calculation of Expected Loss is done based on results of Monte Carlo simulations of project schedule:

$$\text{Expected loss} = (\text{Project Cost with Risks} - \text{Project Cost Original}) * \text{Correlation Coefficient}$$

The correlation coefficient is calculated using project cost and cost increases due to a specific risk occurring. For example, the project cost with risks and uncertainties is

\$100,000. Project cost without risks and uncertainties is \$90,000. In addition, the correlation coefficient for the specific risk is 0.8. Expected loss will be $(\$100,000 - \$90,000) * 0.8 = \$8,000$.

Cost Of Mitigation

1. **Cost of Mitigation** is taken from **Mitigation** tab of **Risk Information** dialog box. It is the cost associated with efforts to reduce the probability and impact of the risk.

For example, mitigation plans will include “Additional QA procedure” and “QA audit of supplier’s operation”, which would cost \$10,000 in total.

Cost After Mitigation

1. **Cost of Response Plan.** Even if a mitigation plan is executed as planned, there will still be a cost associated with a risk, as it is possible to reduce risk, but not to eliminate it (an exception is when you are able to avoid the risk). The response plan may be executed if the risk occurs and will be calculated using the cost entered for the response plan associated with this risk. This cost is entered **Mitigation and Response** view.

For example, if the risk “low quality component” occurs, this component needs to be replaced with a new one, which would cost \$20,000.

2. Residual risk may still exist after the risk response and its cost is calculated as the **Cost of Residual Risk**.

For example, the new component installed as a risk response can still be defective. The residual cost of the risk will be \$10,000.

3. **Probability After Mitigation** comes from **Mitigation** tab of **Risk Information** dialog box. See “Risk Mitigation and Response Plans” for more information.

For example: Risk Probability after mitigation equals 25% because of the execution of the mitigation plan “additional QA procedure”, probability of risk “Low quality component” is reduced two times.

4. **Expected Loss After Mitigation** (property “*Post-mitigation Expected Loss*”) takes in to account the fact that risk may not occur.

Expected Loss After Mitigation = (Cost of Response Plan + Cost of Residual Risk) * Probability After Mitigation

For example, probability of risk “low quality component” after mitigation equals 25%. Expected loss after mitigation will be $\$7,500 = (\$20,000 + \$10,000) * 25\%$.

Other Cost Indicators (Properties)

1. **Cost After Mitigation = Expected Loss After Mitigation + Cost of Mitigation**

For example: Total cost after mitigation of risk “low quality component” will be $\$17,500 = \$7,500 + \$10,000$

2. **Saving from Mitigation/Enhancement** is the difference between costs with and without mitigation. If this number is negative mitigation efforts will not lead to cost saving.

Saving from Mitigation = Expected Loss – Total Risk Cost after Mitigation

For example, total cost after mitigation of risk “low quality component” will be \$17,500. Expected loss \$25,000. Saving from Mitigation is \$7,500. Because this number is positive, it makes sense to perform mitigation efforts.

Custom Risk Properties

All risks properties including pre-defined risk properties and custom properties can be viewed and edited using the Custom Properties tab of Risk Information dialog box.

1. Click the **Risks** tab. In the **Risk View** group, click **Risk Register**.
2. Double-click on risk ID to open the **Risk information** dialog box.
3. Use **Custom Properties** tab to enter general information about risk. Enter or update values of properties. You can assign a set of custom risk properties using the **Default Risk Properties** dialog.

Risk Reviews

RiskyProject helps you to facilitate regular risk reviews. You can define the risk review periodicity (weekly, monthly, and quarterly). RiskyProject will notify you before review is scheduled. During the risk review, you may analyze all risk attributes, make necessary changes, and write notes. Risk reviews are important components of the risk management monitoring and control process as the status of risks and their attributes, such as probabilities and impacts, are in constant flux during the course of a project.

Risk review due date

Each risk review can have a scheduled due date. The risk should be reviewed on or before a due date. A few days before due date RiskyProject will notify you regarding the scheduled review. The notification will be presented as a change in color of the **Next Review** property if it is inserted in Risk Register:

The screenshot shows a table with columns: Risk Name, Open..., Risk/Issue, Threat/O..., Next Review, Risk ID, and Location. Three rows are visible:

	Risk Name	Open...	Risk/Issue	Threat/O...	Next Review	Risk ID	Location
1	Low quality component	Opened	Risk	Threat	06/13/11 08:00	R00000001	
2	Financing delay	Opened	Risk	Threat	04/05/11 08:41	R00000003	
3	Delay with assembling	Opened	Risk	Threat	05/16/11 08:40	R00000002	

Callouts from the image:

- Top callout: "Risk was reviewed. Due date is set some time in the future." (points to the 06/13/11 date)
- Bottom-left callout: "Warning: due date is approaching" (points to the 04/05/11 date)
- Bottom-right callout: "Risk review is overdue" (points to the 05/16/11 date)

You can also view the Next Review date in the **Risk Review** tab of the **Risk Information** dialog box. You can insert a **Next Review** column in the **Risk Register** view.



The default risk review frequency and number of days before incoming risk review is defined in **Default Risk Properties** dialog (**Risk** tab of the ribbon, **Settings** pane).

Entering and viewing risk reviews

You may enter information regarding risk review using **Risk Review** tab of the Risk Information dialog box. The Risk Review tab offers greater flexibility to view all risk reviews for the project, as well as allowing you to modify or delete risk reviews.

To enter a risk review:

1. On the ribbon, click **Risk > Risk Register**.
2. Double-click on risk ID to open the **Risk information** dialog box.
3. In **Risk Review** dialog box enter who submitted review, review notes, and click OK.
4. If necessary, update due date for the next review using **Next Review** field or update frequency of review for this risk using **Review Frequency** dropdown list.

Assigning Risk Response Plans

Response plans defined in the **Mitigation and Response** view can be assigned to risks.

Assigning Response Plan:

1. Click the **Risks** tab. In the **Risks View** group, click **Risk Register**.
2. Double-click on risk ID to open the **Risk information** dialog box.
3. Click the **Risk Form** tab
4. In the default Risk Form select a response plan from **Response Plan** dropdown list. These response plans are defined in Mitigation/Response view.
5. If you are not using the default Risk Form, you can add the response plan dropdown list using **Dropdown Edit** button in Editing Mode of Risk Form. See *Risk Form* for more information.
6. If you don't see your response plan in the dropdown list, it means that the response plan is not defined in the **Mitigation/Response** view. You still can enter Response plan name in RiskyProject, but it will not be used for risk cost calculation.

Assign Mitigation Plans

You can assign mitigation plans defined in the **Mitigation and Response** view to your risks. One risk may have multiple sequential mitigation plans. They can be shown as a Waterfall diagram.

Waterfall diagrams can be used to visualize the timing of mitigation efforts over the course of the project.

Enter probability and impact on each mitigation phase. The score will be calculated automatically.

Mitigation plan can be assigned to a resource. It is defined in the Mitigation/Response view

Mitigation plans can be linked to a task. Double click on task ID to define this task.

Probability and Impact of risk before and after mitigation are shown here.

Enter the date, when mitigation efforts are expected to start.

Enter the date, when mitigation efforts actually started

Mitigation cost. If mitigation plan is linked to a task, % completed, cost and actual will be taken from task information.

Select a mitigation plan from the drop-down list. You can also enter a mitigation plan here and it will be automatically added to the Mitigation and Response view.

Actual mitigation based on Actual Dates

Colors for the waterfall diagrams are defined by the risk tolerance (see Format Risk Matrix).

Mitigation Plan	Start	Start Act	Probab	Impact	Score	Cost (Mitiga	Cost Actual	Assigned to	% Comp	Associated Task
1 Current	01/26/22		5	5	25	\$0.00	\$0.00			
2 Original	02/09/22		5	5	25					
3 mitigation 1	02/23/22	02/21/22	4	4	16	\$0.00	\$0.00		0.0%	
4 mitigation 2	02/09/22	03/07/22	3	3	12	\$0.00	\$0.00		0.0%	
5 mitigation 4	03/03/22	03/14/22	3	3	9	\$0.00	\$0.00		0.0%	
6 mitigation 5										
7 mitigation 6										



- Pre-mitigation probability and impact are the results of calculation. Therefore, they cannot be updated in the waterfall tab.
- Probability, impact, and score for the last mitigation effort are converted into the post-mitigation probability, impact, and score and will be shown in the Risk Register.
- You can view Planned and Actual risk mitigation efforts. Actual mitigation efforts are shown based on actual dates entered the table above.

Viewing and editing waterfall diagrams:

1. Open the **Risk Register** view.
2. Double-click on Risk ID. The **Risk Information** dialog box opens.
3. Click the **Mitigation (Waterfall diagram)** tab.
4. Enable or disable Actual and Planned mitigation lines using check boxes on the left bottom corner.
5. Double click on Mitigation Plan ID; the Mitigation Plan Properties dialog box opens.
6. Enter a mitigation description.

7. Select the task or summary task to assign it the mitigation plan. If mitigation plan is linked to the task, cost, actual cost, and percent completed of the mitigation plan will taken from task.
8. To delete the task assignment, click **Clear task selection**.

Risk History

The Risk History records any changes made to the risk over time. Risk history is automatically updated when you save the project.

View a risk history:

1. Click the **Risks** tab. In the **Risk Views** group, click **Risk Register**.
2. Double-click on a risk ID to open the **Risk information** dialog box.
3. Click the **History** tab to view risk history
4. To copy a risk history record to the clipboard, Right-click on a record ID and select **Copy Data**.
5. To delete record, Right-click on record ID and select **Delete Item**.



- You can modify the date of the history record. Other fields are read-only, so you cannot modify them, but you can delete the risk history record.
 - Risk history is used to present the history on the Risk Matrix, as well as to determine the Original risk probability and impact.
-

Risk Matrix and Risk Trend Chart

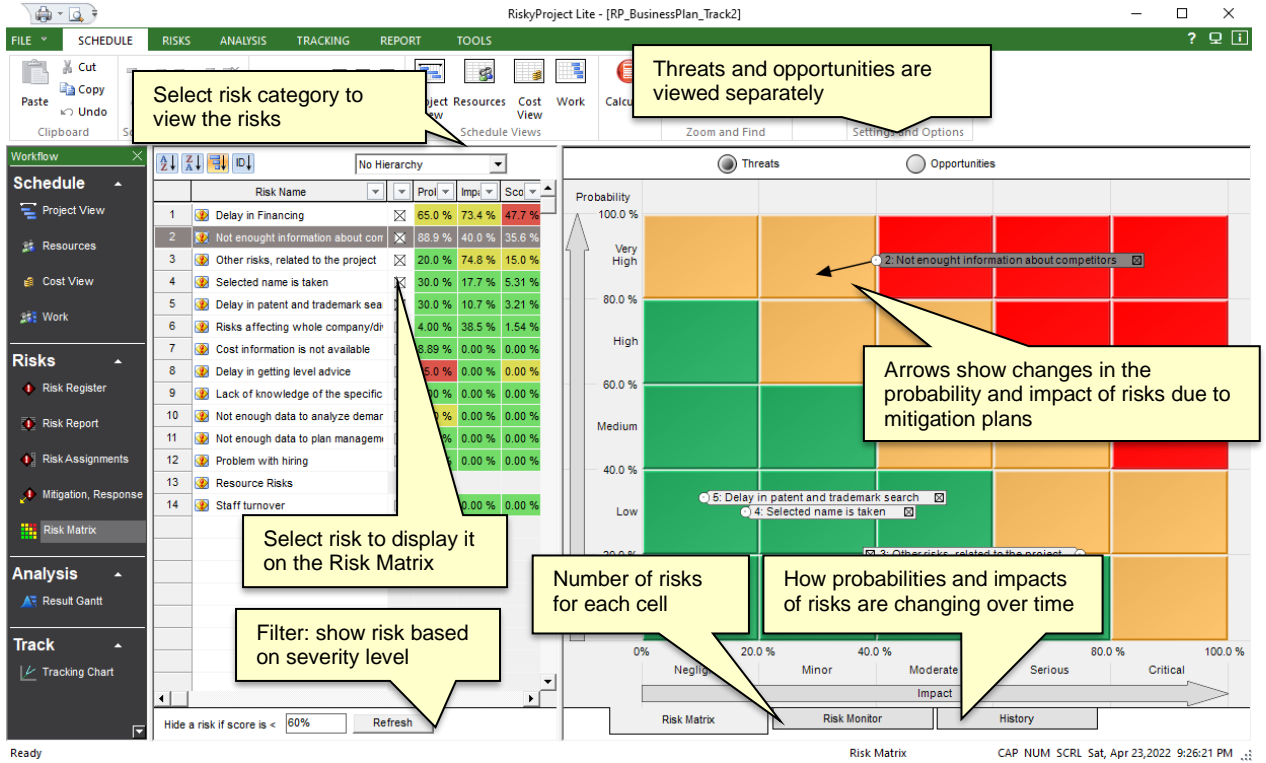
Risk Matrix and Risk Trend views allow you to determine the severity of a risk and analyze how risks are changing over time:

- The **Risk Matrix** is a tool that allows you to determine the severity of a risk. The Risk Matrix view shows this using the risk probability (y-axis) vs. calculated risk impact (x-axis) of the project risks. The Risk Matrix view is divided into two sections: a table with a list of risks with their actual calculated values for probability, impact, and score. When you select these risks, they are shown visually on a matrix, which provides a visual comparison of this data put as well as putting each risk into the context of your organization's risk tolerance. Changes in probability and impact due to mitigation plans added to a risk's mitigation waterfall chart will automatically be displayed in the Risk Matrix.
- The **Risk History** shows how the probability and impact of an individual risk has changed over time.
- The **Risk Monitor** shows the number of risks per cell in the risk matrix.
- The **Risk Trend** shows how project risk change over time. The Risk Trend can be presented as bar chart or in table format (**Total Risks**).

Viewing the Risk Matrix

1. Click the **Risks** tab. In the **Risk Views** group, click **Risk Matrix**.
2. Select type of chart you want to view at the bottom of risk matrix.
3. Select the **Threats** or **Opportunities** option at the top of the matrix. You cannot view Threats and Opportunities at the same time
4. Risk scores can be shown on the Risk Matrix based on overall score (No Hierarchy) or a selected risk category which are shown in the **Hierarchy based on** dropdown list. Lists of all risks associated with the selection are shown in the table. Select **No Hierarchy** to view the overall risk score (sum of all risk categories) for selected risks.
5. Select the check boxes beside the risk names to view the risks on the Risk Matrix. To hide a risk, clear the check box. By default, risks with zero impact cannot be selected. Use the filter at the bottom of the list ("Hide a risk if Score is < " or "Show risks with severity level...") to show/hide risks below the entered threshold. Severity level is defined in **Risk Trend Chart Settings** dialog. Essentially in the color of risk matrix.

To format the Risk Matrix, right-click on the **matrix** and choose **Format Risk Matrix**. For more information about formatting the Risk Matrix, read, "Format the Risk Matrix and Risk Trend Chart".

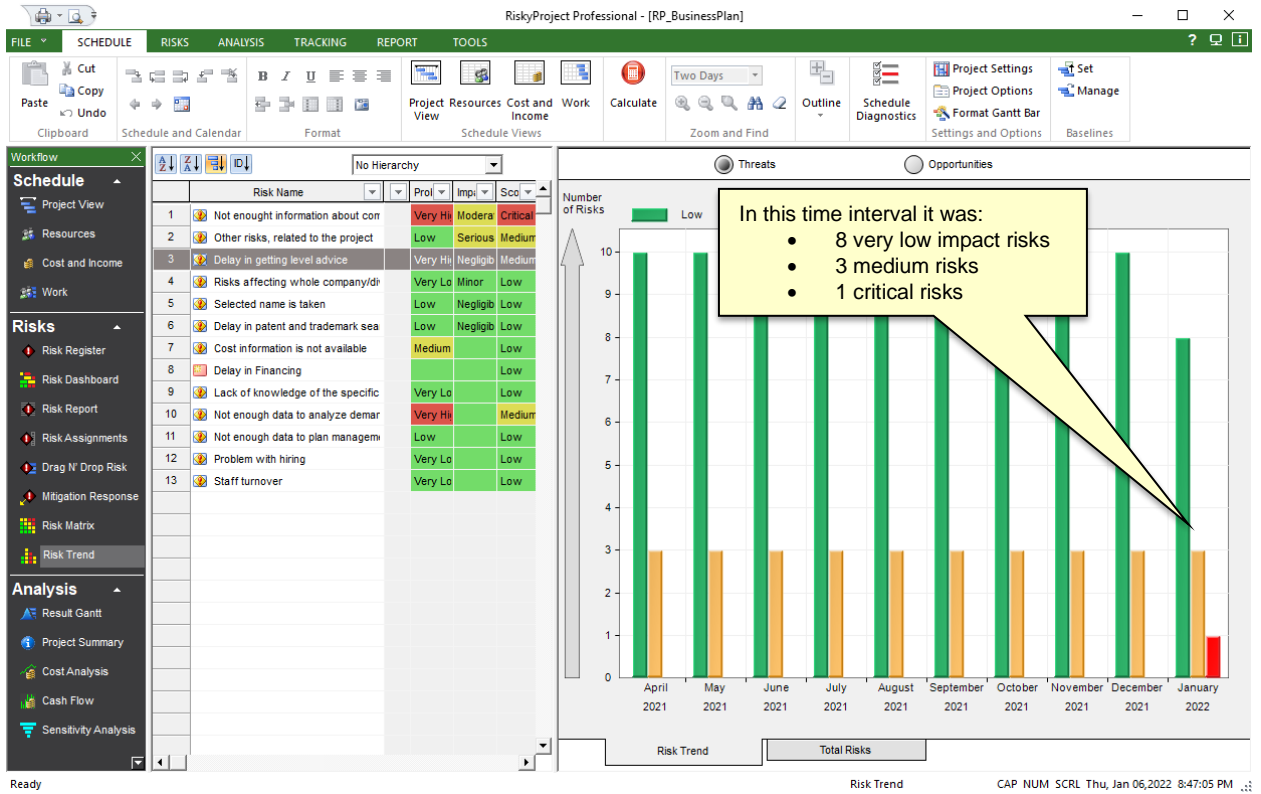


Viewing the Risk Trend Chart

Risk Trend shows how many risks belonging to different severity levels (colors) existed in a certain time period. To view Risk Trend Chart:

1. Click the **Risks** tab. In the **Risk Views** group, click **Risk Trend**.
2. Select a chart type from the tabs at the bottom of the of chart.
3. Select the **Threats** or **Opportunities** option at the top of the chart. You cannot view Threats and Opportunities at the same time
4. Select a No Hierarchy or a specific risk category from the **Hierarchy based on** dropdown list. Lists of all risks associated with the selection are shown in the table. **No Hierarchy** shows the calculated overall risk score (sum of all risk categories) for selected risks.

To format the Risk Trend chart, right-click on the chart and choose **Format Trend Chart**. For more information about formatting the Risk Trend Chart, read, “Format the Risk Matrix and Risk Trend Chart”.



Copy the risk matrix and risk trend chart to the clipboard or save as a JPEG file

1. Right-click on the **Risk Matrix** or **Risk Trend**
2. Choose **Copy to Clipboard** or **Copy Chart to File (JPEG, PNG, GIF...)**.
3. If you chose to create a file, you will be prompted to select file format and save it to a directory.

Risk Report

The Risk Report is a view that includes the selected attributes of selected risks. The report for one risk may contain one or many pages. The total number of pages per report equals the number of selected risks multiplied by the number of pages per risk. The Risk Report includes seven sections:

1. General Properties
2. Pre- and post- mitigation probabilities, impact and score
3. Cost of Risk
4. Custom Properties
5. Waterfall Chart
6. Mitigation Plans
7. Risk Reviews

Each page of the risk report contains a header and footer. The header and footer may include up to three lines of text and a logo located on the left or right side.

Customize the Risk Report

You can customize the Risk Report in the following ways:

- Select the order and turn on and off any section of the report
- Customize any particular section by enabling or disabling any attribute and customizing labels of the attribute. For example, by default the label for risk detailed description is called “Description”. Instead, you may use “Information about risk”.
- Customize headers and footers. Specifically, you can select a logo (company) that can be placed in the header and/or footer.
- Modify attribute values or labels.

To customize the risk report

1. On the **Risks** tab, click **Risk Report**.
2. At the bottom of the view, click **Customize Risk Report**.
3. Enable/disable attributes, customize attribute’s label, make label or value of the attribute bold
4. In the **Order of Data Tables**, select the data tables you want to include in the report and use the **Move Up** and **Move Down** buttons to change the order of the sections
5. For “Pre- and post- mitigation probabilities, impact and score” of the report enable or disable pre and post mitigation matrixes.
6. Click **OK**. The report will be regenerated to reflect the changes.

Company: XYZ Software Products
Division/Group: Software Development Division
Project Name: Small business web site design and development

Risk: Difficulties to obtain comprehensive information

Risk ID: R0000108

Description:

Risk status (Open or Closed): Open

Objectives:

Assumptions:

Risk Owner: John Lemman
Manager: John Lemman

Cause:

Trigger:

Residual Risk:

Response Plan Name:

Pre-mitigation		Post-mitigation	
Probability (Pre-Mit.)	30.0%	Probability (Post-Mit.)	25.0%
Impact (Pre-Mit.)	3.0%	Impact (Pre-Mit.)	4.7
Score (Pre-Mit.)	0.9%	Score (Pre-Mit.)	11
Threat Strategy	Mitigate		
Opportunity Strategy	Enhance	Review Frequency	M

Risk Cost

Cost Before Mitigation (Potential Loss):	\$2,000
Probability (Pre-Mit.):	30.0%
Pre-mitigation Expected Loss (Pre-mitigation Probability * Potential Loss):	\$600.0
Cost of Mitigation (from Waterfall Diagram):	\$500.0
Cost of Residual Risk:	\$1,000
Cost of Response Plan (from Mitigation and Response View):	\$0.00
Probability (Post-Mit.):	25.0%
Post-mitigation Expected Loss (Post-mitigation Probability * Residual Risk):	\$250.0
Cost After Mitigation (Cost of Mitigation + Post-Mitigation Expected Loss):	\$750.0
Saving from Mitigation/Enhancement (Cost After Mitigation - Pre-mitigation):	\$-150.0

Format Risk Report

Property	Report	Label	Bold Label	Bold Value
1 Report Table: General Properties	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
2 Description	<input checked="" type="checkbox"/>	Description	<input type="checkbox"/>	<input type="checkbox"/>
3 Risk status (Open or Closed)	<input checked="" type="checkbox"/>	Risk status (Open or Closed)	<input type="checkbox"/>	<input type="checkbox"/>
4 Report Table: Probabilities, Impacts, and Scores	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
5 Probability (Pre-Mit.)	<input checked="" type="checkbox"/>	Probability (Pre-Mit.)	<input type="checkbox"/>	<input type="checkbox"/>

Report Header

Draw Logo on the Right
 Draw Logo on the Left
 Logo bitmap file path: C:\Program Files (x86)\Intaver\RiskyProject 4.2\samples\intaverLogo.bmp

Line 1: *** Company Name *** Bold
 Line 2: *** Division/Group *** Bold
 Line 3: *** Project Name *** Bold

Pre-Mitigation Probabilities, Impact, and Score
 Show Pre-Mitigation Data Show Matrix

Post-Mitigation Probabilities, Impact, and Score
 Show Post-Mitigation Data Show Matrix

Labels:
 Pre-mitigation: [Matrix] Label: [Matrix]
 Post-mitigation: [Matrix] Label: [Matrix]

Labels for risks, issues, and lessons learned

Risks: Risk Bold
 Issues: Issue Bold
 Lessons Learned: Lesson Learned Bold

Title for Data Tables

Risk Assignments: Risk Assignments Bold
 Cost of the Risk: Risk Cost Bold
 Custom Properties: Custom Properties Bold
 Risk Reviews: Risk Reviews Bold

Report Footer

Draw Logo on the Right
 Draw Logo on the Left
 Logo bitmap file path: C:\Program Files (x86)\Intaver\RiskyProject 4.2\samples\intaverLogo.bmp

Line 1: *** Project Manager *** Bold
 Line 2: *** Project Created *** Bold
 Line 3: *** Project Modified *** Bold

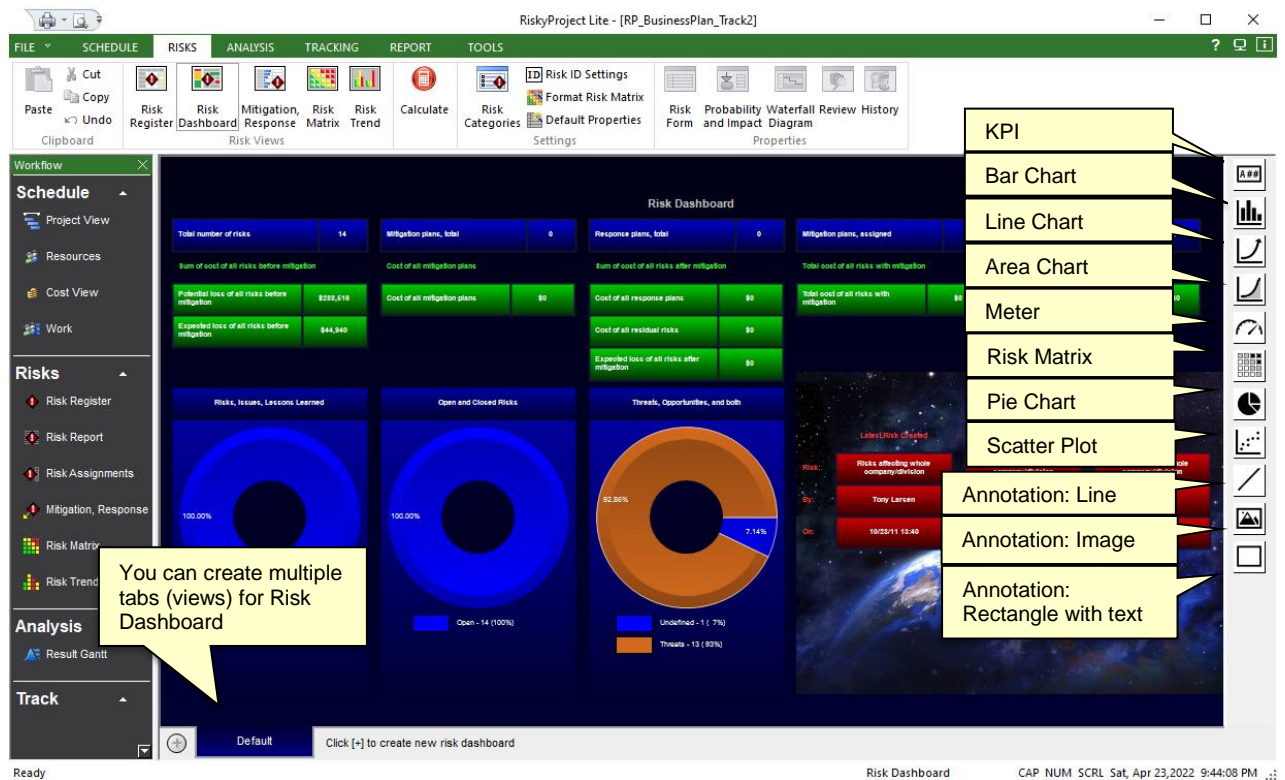
Callouts:

- Customize Header
- Enable/disable attribute, customize attribute's label, make label or value of the attribute bold
- Select section of the risk report and change the order of the sections
- Customize Pre- and post- mitigation section
- Customize Footer
- Select logo as a bitmap

Risk Dashboard

The fully customizable Risk Dashboard allows you to present hundreds of different KPIs and charts related to your risks. You can create any number of dashboards with different information, which are shown as different tabs within Risk Dashboard View. You can select from 7 types of charts: line, area, pie, scatter, bar (including frequency histogram), different types of meters, and risk matrixes. You can place them in different areas on the dashboard, adjust their size, colors, and other properties. You can also annotate your dashboard with text, lines, and images.

When you modify your risk data, the charts and KPIs are automatically updated. This date includes risk properties, mitigation and response plans, and project schedules. Annotation is not updated when we update risk data.



To add a chart, KPI, or annotation to the Risk Dashboard:

1. Select the type of chart or KPI from the toolbar on the right side.
2. Click on the dashboard and drag the line or rectangle to select the position of the chart, KPI, or Properties annotation.
3. Right click on chart, KPI, or annotation.
4. Select **Properties** from shortcut menu; **Properties** dialog opens.
5. Enter properties of the chart, KPI, or annotation; it includes type of chart or what type of data this chart, KPI or annotation will represent as well as graphic properties.
6. Click **Close** to close the Properties dialog box.

To modify a chart, KPI, or annotation

1. Click on the chart, KPI, or annotation; chart, KPI, or annotation you want to modify.
2. Move or expand the area to adjust size or position of the chart, KPI, or annotation
3. Right click on chart, KPI, or annotation and click **Properties** from shortcut menu; **Properties** dialog opens.
4. Modify properties of the chart, KPI, or annotation; it includes type of chart or what type of data this chart, KPI or annotation will represent as well as graphic properties.
5. Click **Close** to close the Properties dialog box.
6. To enter text or update font and alignment, right click on KPI and Annotation rectangle and select **Edit or Format Text** within a shortcut menu.

To export dashboard

1. Right click in any place of dashboard, and from the shortcut menu click **Copy Dashboard to Clipboard** or **Copy Dashboard to File**.
2. In you export dashboard to file, you can select file format: JPEG, PNG, GIF, BMP, or TIFF



- Many KPIs and charts are based on results of Monte Carlo simulations. Therefore you need to perform calculation to see results of analysis on the dashboard.
 - RiskyProject comes with default dashboard. To Generate default dashboard right click in any place of dashboard and select *Create Standard Dashboard* from shortcut menu.
 - To completely clear dashboard click in any place and select *Clear Dashboard* from shortcut menu
 - You can save dashboard in system registry for all new project. To do then click in any place and select *Save Dashboard as Default* from shortcut menu
 - You can modify background color of dashboard by clicking in any place and selecting *Dashboard Setting* from shortcut menu
 - You can copy and paste selected chart, KPI, or annotation. To do that right click on any selected chart, KPI or annotation, and select *Copy* from shortcut menu. Then right click on any area of dashboard where you want to paste it and select *Paste* from shortcut menu.
 - Risk Dashboard can be printed. To Print dashboard click on *File > Print*
-

Setting up Defaults for Qualitative Risk Analysis

Risk ID Settings

You can generate Risk IDs automatically. Alternatively, you can enter the Risk IDs manually, in the same manner as you enter any other risk property. If a Risk ID is generated automatically, you can overwrite it manually. Risk IDs will be incremented each time you enter new risk.

Risk IDs may include four components

1. **Prefix** – any symbols (optional)
2. **Number** – from 4 to 16 digits (optional)
3. **Suffix** – any symbols (optional)
4. **Date** – date format can be defined (optional)

Risk ID can be unique for all projects on your computer or unique only for a particular schedule. For example, if Risk ID is unique for all projects on your computer:

- Project A will have risks R0001, R0002, R0003, R0004
- Project B will have risks R0005, R0006, R0007

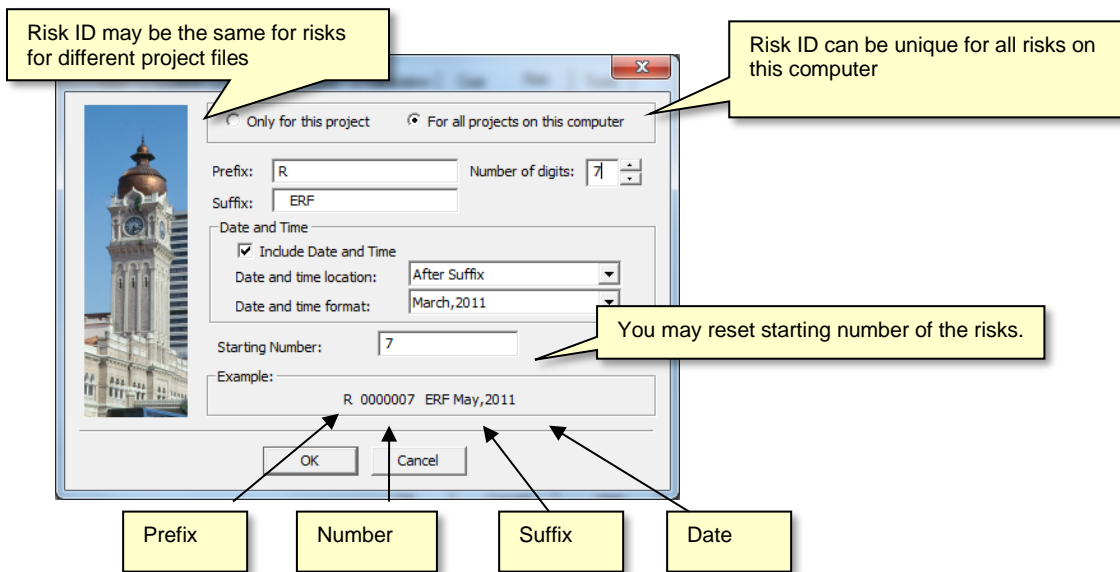
If Risk ID unique only for the particular schedule:

- Project A will have risks R0001, R0002, R0003, R0004
- Project B will have risks R0001, R0002, R0003

You can always reset the starting number. The starting number only affects new risks and does not affect risks, which had been previously entered. However, if you update the starting number the Risk ID may not be unique. In addition, the Risk ID may be not unique if you manually overwrite automatically generated risk ID.

To enable automatic generation of Risk ID and define format of Risk ID:

1. Click the **Schedule** tab. In the Settings group, click **Options**.
2. Click the **Risk** tab.
3. Select the **Generate Risk ID automatically** check box.
4. Click on **Risk ID Format** to define rule of Risk ID automatic generation; **Risk ID Format** dialog box opens.
5. In the **Risk ID Format** dialog, select how Risk ID will be generated: for particular project or for all projects on your computer.
6. Define the Risk ID prefix and suffix.
7. Define the number of digits for Risk ID generation.
8. Enable / disable date as part of the Risk ID format.
9. If date is enabled, define the date format and position.
10. Define the starting number for generating Risk IDs.



Managing Risk Categories and Outcome Types

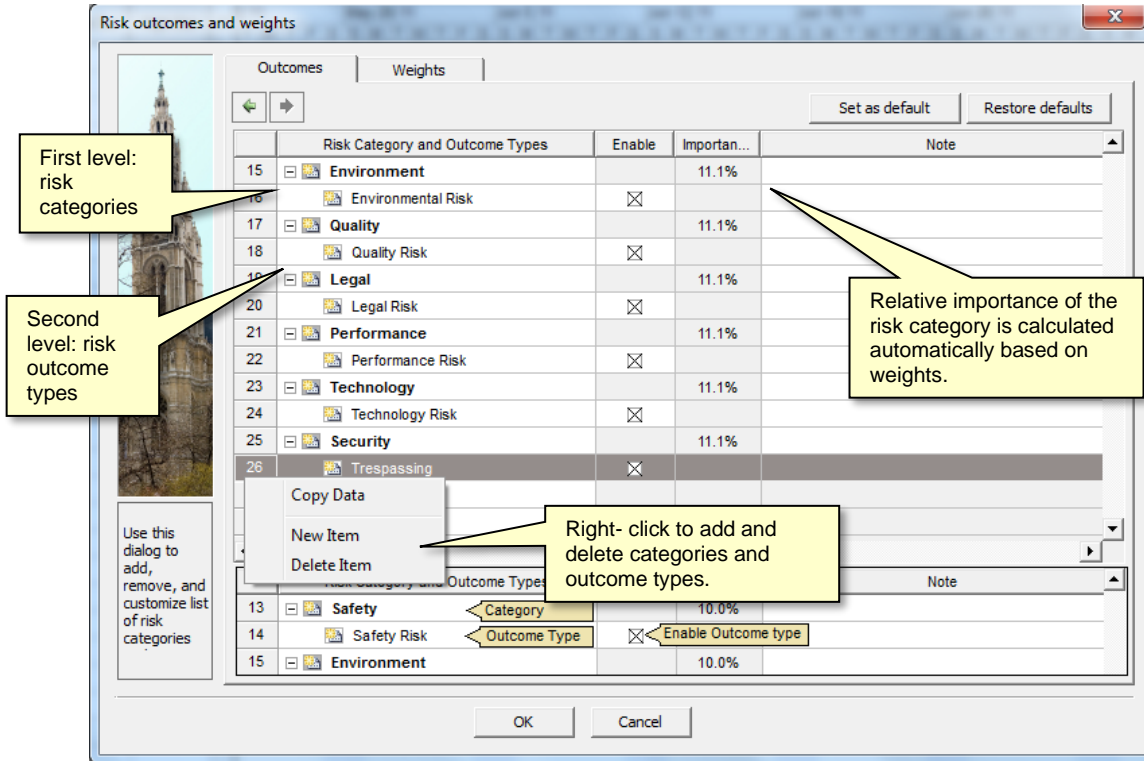
RiskyProject has a default list of risk categories and outcome types. You may customize risk categories and outcome types: add new outcomes or delete existing categories or outcome types.

For example, you add the category Security, which is not in the list of predefined categories:

Category:	Security
Outcome Type 1:	Trespassing
Outcome Type 2:	Information Security Failure

Categories are shown at the top of Risk Register, Risk Matrix, and Risk Report views. You are able to filter risks based on category. Outcome types are filtered based on the risk probabilities and outcomes. For example, you enter the risk “Failure of security procedure.” It will have probability 60%, outcome type “Information Security Failure” and outcome “Low.”

Risk categories related to project duration are referred to as “Schedule and Scope.” This category is shown Risk Register as the “Duration” category. Risk categories related to project cost are referred to as “Cost and income” and are shown in the risk register as the “Cost” category. Under both these categories, you will find a number of outcome types. Most of these outcome types are reserved for quantitative risk analysis (read “Quantitative Risk Analysis” for more information). For qualitative risk analysis only two outcome types are available: “Relative Delay” for “Schedule and Scope” and “Relative Cost Increase” for “Cost and income category.”



- One risk may have different outcomes type and categories. For example, “Low quality supplies” can affect quality and safety. RiskyProject will calculate the impact of this risk on safety and quality separately, and the combined impact on all risk categories.
- You can enable/disable risk outcomes. Once disabled, risk outcomes will no longer be available on the **Probabilities and Outcome** tab of **Risk Information** dialog box.
- You may save a customized set of risk categories and outcome types to the system registry for all future projects on your computer by clicking the **Set as Default** button. This new default set of risk categories and outcome types will not affect existing projects. You may also restore a pre-defined set of categories and outcome types by clicking the **Restore Defaults** button.
- You may copy the risk category and outcome type data to the clipboard. To do this, select a row under which you want to add a copy risk outcome, right-click on the row number and choose **Copy Data**

Adding risk categories

1. Click the **Risks** tab. In the **Settings** group, click **Categories and Outcomes**.
2. Click the **Outcomes** tab.
3. Select a row above where you want to add a new risk category.
4. Right-click on the row number and choose **New Item**.
5. Provide a name.

- Click the **Outdent** arrow. By default, all new rows are considered risk outcomes, by moving the outcome to the left the outcome is converted into a risk category. This is indicated when the name is bolded, and the Task and Resource check boxes disappear.

Risk Weighting

Risk Weighting is a method of assigning the relative importance of a particular risk category to an organization and is important when dealing with multi-criteria decision-making. RiskyProject uses a form of the Analytical Hierarchy Process (AHP) to weigh the relative importance of one risk category over another. By default, weights for all risk categories are equal.

AHP is a two-step process:

- Develop a list of your risk categories and criteria.
- Perform a pair-wise comparison to establish consistent ranking or priorities for each risk category.

For example, after determining your organization’s risk preferences, you determine that Safety risk is twice as important as Environment; you would enter a 2 into the cell where the Environment category row intersects the Safety column.

Outcomes		Weights							
Risk Category and Outcome		Importan...	Sched...	Cost a...	Safety	Enviro...	Quality	Legal	Pe
13	Safety	13.8%	1.00	1.00	1.00	2.00	1.00	1.00	1.1
15	Environment	11.6%	1.00	1.00	0.50	1.00	1.00	1.00	1.1
17	Quality	12.4%	1.00	1.00	1.00	1.00	1.00	1.00	1.1
19	Legal	12.4%	1.00	1.00	1.00	1.00	1.00	1.00	1.1
21	Performance	12.4%	1.00	1.00	1.00	1.00	1.00	1.00	1.1
23	Technology	12.4%	1.00	1.00	1.00	1.00	1.00	1.00	1.1

Notice that the relative importance of the Safety Category has increased to 13.8 while the rest of the categories have decreased.

These weights will be used in the calculation of the risk impact on all categories.

Weighting risk categories

Before you can add risk weights, you should perform a risk weighting analysis to determine the relative importance of each risk category to your organization.

- Click **Risks** tab. In the **Settings** group, click **Categories and Outcomes**.
- Click the **Weights** tab.
- Select the risk category to which you want to add the weighting factors.
- Enter the risk-weighting factor for each risk category (column).
- Repeat Steps 3 and 4 for each risk category.

Managing Default Risk Properties

Risk Properties


Each risk may have risk properties. These properties are useful for storing any information about the risk. You can use risk properties to search and filter the Risk Register. Risk properties can be different types:

- String – text information
- Integer number
- Real number
- Resource – can be taken from list of resources
- Date
- Picklist: dropdown list with values
- Mitigation Action: used to import data from Excel, see “Importing Risk Register from Microsoft Excel”
- Threats or Opportunities: used to import data from Excel, see “Importing Risk Register from Microsoft Excel”
- Response Plan: by using this property type you can define multiple response plans
- Yes/No

Integer numbers and real numbers have maximum and minimum values.

The list of risk properties is hierarchical; the risk properties are subdivided into separate groups.

Editing the default risk properties

1. Click the **Risks** tab. In the **Settings** group, click **Default Properties**.
2. Select a row under which you want to add a new risk outcome.
3. Right-click on the row number and choose **New Property Item**
4. Type in the name.
5. Select type, maximum and minimum values for the new property.
6. Use the **Indent** and **Outdent** arrows  to create groups of risk properties.
7. If you have Picklist type risk property double-click on risk property ID; Picklist dialog box will open where you can enter the list of values.

Default risk properties are automatically saved in the system registry and can be used for all projects. You may use the **Restore Default** button to overwrite changes in default risk properties you made with standard set of risk properties.

Format the Risk Matrix and Risk Trend Chart

You can modify the Risk Matrix to define the risk matrix’s number of row and columns, define labels and the risk tolerance display. These settings will be used in Risk Matrix view.

Risk Tolerance

The level of risk tolerance is displayed using color-coding (for threats: green: low risk, yellow: medium risk, red: high risk). A high number of green cells on the chart indicates a high-risk

tolerance. A high number of red cells on the chart indicates a low risk tolerance. Color-coding for opportunities is the opposite.

Number of Rows and Columns, Labels for Probabilities and Impacts

In the Format Risk Matrix dialog box, the number of rows in the Probability table corresponds with number of rows of the risk matrix, and the number of rows in the Impact table corresponds with the number of columns in the risk matrix. Therefore, to add or remove a row or column in the risk matrix, simply add or remove the label in the probability or impact table.

You may define probability and impact for different labels for each risk category. In addition, you may define different labels for threats and opportunities.

For example, if, in the Duration category, the impact label for “Threats” is “Low: 1 month delay”, the impact label for the opportunity in the same category is “Low: 1 month acceleration”. If you do not define labels for a risk category, the default set of labels will be used. You may modify the default set of labels by selecting “Default” from the dropdown list and then editing as required.

Probability labels are used only in the Risk Matrix; impact labels used appear in the Risk Matrix as well as to define outcomes of each risk in the **Probabilities and outcomes** tab of the **Risk Information** dialog box.

For example, an impact label “Low: 1 month delay” will be shown on the horizontal axis of the Risk Matrix. In addition, when you define the impact of a risk, which has an outcome type “Relative delay”, you will be able to select the outcome “Low: 1 month delay”.

Enter probability labels and ranges for threats and opportunities

Select risk category from the dropdown list

Click on number to assign custom risk score

Probability labels are shown here

Enter impact labels and ranges for threats and opportunities

You may add symbol or number before probability and impact label

Risk Probability and Outcome can be expressed different ways

Impact labels are shown here and here

Number of rows equal number of rows in probability table

Number of columns equals number of rows in impact table

Use slider to define risk tolerance

When entering risk probabilities and outcomes in Risk Register and other views:

- Show label only: e.g "Low Impact"
- Show percent together with impact label: e.g. "Low Impact - 15%"
- Show percent only: e.g "15%"
- Index of the label (1,2,3,4...) in drop down list
- Index and label: e.g. 2: "Low Impact" in drop down list

Probability Labels (Threats)	%	Probability Labels (Opportunities)	%
1 Very Low	20.00%	Very Low	20.00%
2 Low	20.00%	Low	20.00%
3 Medium	20.00%	Medium	20.00%
4 High	20.00%	High	20.00%
5 Very High	20.00%	Very High	20.00%

Impact Labels (Threats)	%	Impact Labels (Opportunities)	%
1 Negligible: < 1 month delay	20.00%	Negligible: < 1 month accelerator	20.00%
Minor: 1-3 months delay	20.00%	Minor: 1-3 months accelerator	20.00%
Moderate: 3-6 months delay	20.00%	Moderate: 3-6 months accelerator	20.00%
Serious: 6-12 months delay	20.00%	Significant: 6-12 months accelerator	20.00%
Critical: > 1 year delay	20.00%	Large: > 1 year accelerator	20.00%

Probability	0%	20.0 %	40.0 %	60.0 %	80.0 %	100.0 %
Very High	5	15	15	20	27	
High				16	20	
Medium						5
Low	2	7	6	7	11	
Very Low	1	2	3	4	5	

In Risk Information dialog box:

Risk Information

Risk Form: Probabilities and outcomes | Custom Properties | Mitigation | Risk Review | History

Risk name: 1 | Risk ID: R00001865

Alternatives	Threat/Opportu	Chance	Outcome Type	Outcome
1	Threat	Low	Relative Delay	Minor: 1-3 months delay
2	Threat	Very Low	Relative Delay	Negligible: < 1 month delay
3	Threat	Medium	Relative Delay	Minor: 1-3 months delay

Define Custom risk scores

Risk scores are usually calculated as Probability * Outcome. However, if you have risk probabilities and outcomes expressed as index (1,2,3,4,...) index and label (2: "Low Impact") in the drop down list you may define custom nonlinear scores. These scores are shown in Risk Matrix in **Format Risk Matrix** dialog as number from 1 to 99 on each cell. For example,

- index of low probability is 2 - second row from the bottom of risk matrix
- index of critical outcome is 5 - last columns of risk matrix
- score based on these indexes equal 2*5 = 10
- it is possible to assign a number to this cell different than 10. To do just click on number and enter different number, for example 11.

Nonlinear intervals for probability and impact

In standard risk impact and probability matrixes, intervals can be non-linear. For example, in some 5x5 risk matrixes, Very High probability often indicates a probability of 10 - 70%, High 70 -50%, Moderate 50-30 %, Low 30-20% and Very Low is >10%. The risk matrix can be setup so that the matrix “intervals” can be modified so that each interval can represent a different scale for both probability and impact. The sum of all intervals must be equal to 100%. When you are modifying the ranges, if the sum is not equal to 100%, the background color will be pink. Once the sum equals 100%, the color changes to green.

Very Low	10%
Low	20%
Medium	20%
High	20%
Very High	30%

The same process can be used to customize your impact matrix

Negligible	1%
Minor	4%
Moderate	5%
Serious	10%
Critical	80%

Format risk matrix

Risk Category: Cost

Threat Opportunity

Double click on cell to define a custom color

Click on cell to edit score

Formula to Calculate Combined Impact

Risk Trend Chart Settings

	Probability Labels (Threats)	%	Probability Labels (Opportunities)	%	Probability				
1	Very Low	10.00%	Very Low						
2	Low	20.00%	Low						
3	Medium	20.00%	Medium						
4	High	20.00%	High						
5	Very High	30.00%	Very High						

	Impact Labels (Threats)	%	Impact Labels (Opportunities)	%	Probability				
1	Negligible: < 1% of budget	1.00%	Negligible: < 1% of budget	20.00%					
2	Minor: 1-5% of budget	4.00%	Minor: 1-5% of budget	20.00%					
3	Moderate: 5-10% of budget	5.00%	Moderate: 5-10% of budget	20.00%					
4	Serious: 10-20% of budget	20.00%	Significant: 10-20% of bud;	20.00%					
5	Critical: >20% of budget	70.00%	Large: >20% of budget	20.00%					

When entering risk probabilities and outcomes in Risk Register and other views:

- Show label only: e.g "Low Impact"
- Show percent together with impact label: e.g. "Low Impact - 15%"
- Show percent only: e.g "15%"
- Index of the label (1,2,3,4...) in drop down list
- Index and label: e.g. 2: "Low Impact" in drop down list

Risk Tolerance: _____

Restore Defaults OK Cancel

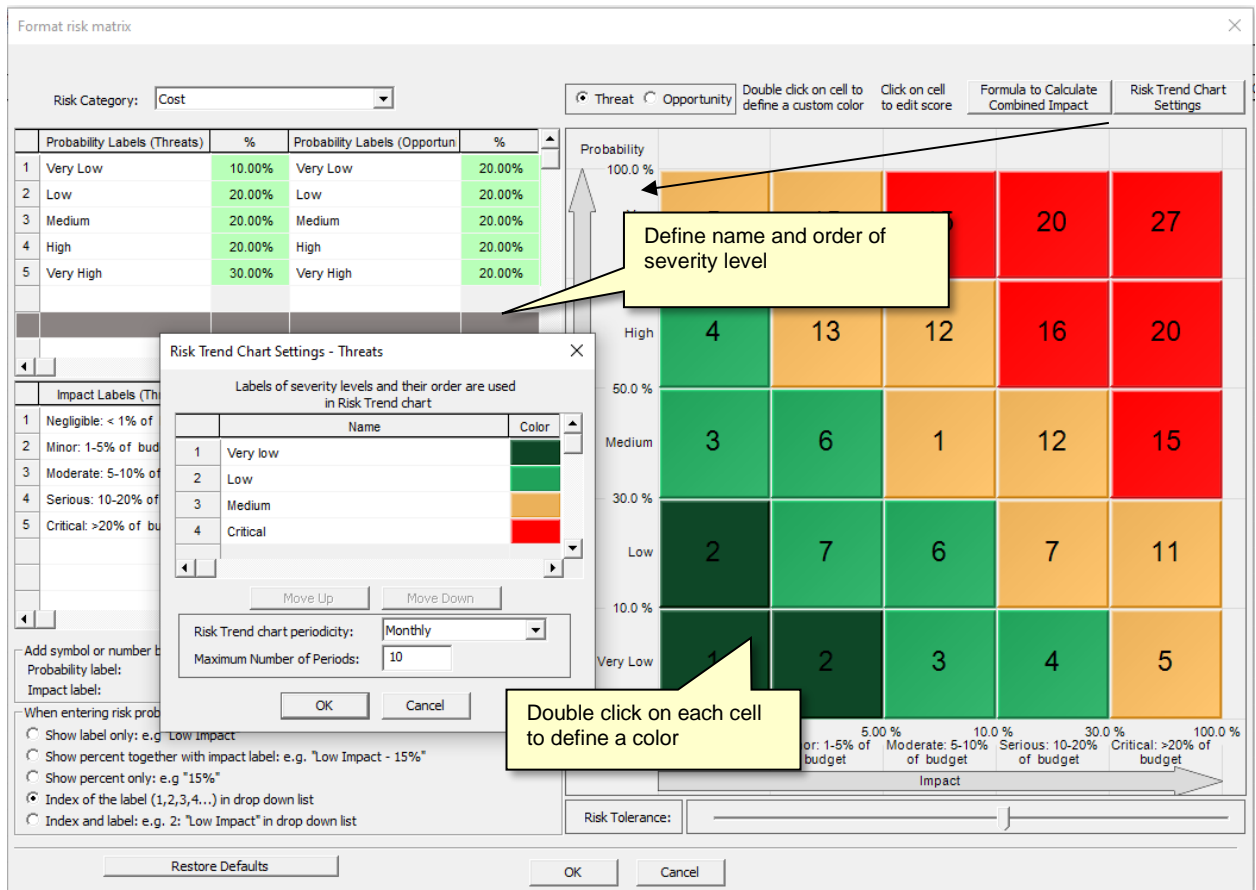
Annotations:

- Intervals for each risk category can be different
- Nonlinear intervals for Probability
- Nonlinear intervals for Impact
- Nonlinear intervals for threats
- Nonlinear intervals for opportunities

The example below shows how this would appear in the Format Risk Matrix dialog box.

Risk Severity Levels

Each color on risk matrix represents a particular risk severity level. By default, there are only three ranges: “**Low**” – green, “**Medium**” – yellow and “**Critical**” red. Each severity level can be associated with certain risk mitigation and response actions. For example, risks that appear on green cells are low risk and can be accepted.



You may change color of each cell by double-clicking on the cell. You may also define a name of each range, and order how different ranges are shown in the Risk Trend Chart, as well as the periodicity of the risk trend chart.

Steps to Format Risk Matrix

To format the Risk Matrix:

1. Click the **Risks** tab. In the **Settings** group, click **Format Risk**.
2. Select a risk category from dropdown list. “Default” category is used if you did not explicitly define labels for specific risk category.
3. Modify the **Intervals** for **Impact** and **Probability** for the selected risk category.
4. Modify the **Impact** and **Probability** labels as required for the selected risk category.
5. Drag the **Risk Tolerance** slider to the left to set a low risk tolerance or to the right to set a high-risk tolerance.
6. Toggle between **Threat** and **Opportunity** to view how the risk matrix will look like for threats and opportunities.
7. Define how risk outcomes in Risk Information dialog box or Risk Register will be shown:
 - As label only (e.g., “Low Impact”)
 - As percent together with label (e.g., “Low Impact – 15%”)

- As percent only (e.g., 15%)
 - As index of the label (1,2,3,4...) in dropdown list
 - As index and the label: e.g. 2: Low Impact in dropdown list
8. Add symbol or number before probability or impact label. For example, instead of “Very Low” label you may use “A: Very Low”.
 9. The define properties of the severity level by clicking on “**Risk Trend Chart Settings**”
 10. **Formula to Calculate Combined Impact** allows you define algorithm for impact calculation.



Your settings will be saved to the system registry for all new projects on your computer. These new defaults will not affect any previous projects. You can also restore the pre-defined set of categories and outcome types by clicking on the **Restore Defaults** button.

Risk Trend Chart Settings

Using Risk Trend Chart settings dialog box, you can define:

1. Order of bar on Risk trend chart associated with particular risk **severity level**. For example, for each time period **Low** risks (Green color) will first, **Medium** risk (Yellow color) will be second and **High** risks (Red color) will be third. You can use Move Up and Move down buttons to define the order.
2. Name of each range.
3. Risk trend chart periodicity (Monthly, Quarterly, Yearly, etc.)
4. Maximum number periods in in Risk Trend Chart. For example, Risk trend will show 10 month back starting from the current month.

Risk Trend chart settings can be invoked from Format Risk Matrix dialog or by right click on Risk Trend Chart.

Order of Severity Levels is defined in Risk Trend Chart Settings.

1. Very Low – Dark Green
2. Low – Green
3. Medium – Yellow
4. Critical - Red

Define Risk Trend Chart Periodicity

Name	Color
1 Low	Dark Green
2 Medium	Green
3 Critical	Red

Risk Trend chart periodicity: Monthly
Maximum Number of Periods: 10

Algorithm for Impact Calculation

You may define algorithm for impact calculation using **Formula to Calculate Combined Impact** button. There are two algorithms:

- Combined impact = maximum impact of all categories; for example, Cost Impact is 30%, Schedule Impact is 40%, and Safety Impact is 10%. Total impact is 40%
- Combined impact = sum of impacts in each category and then normalize. For example, Total impact will be 70%. However, if total impact for at least one risk in risk register with exceed 100%, all impacts for all risk register will be proportionally reduced to ensure that on impact is greater than 100%.

To define algorithm for impact calculation:

1. Click the **Risks** tab and then click on Format Risk Matrix
2. Click on **Formula to Calculate Combined Impact**
3. Select **Calculation of combined risk impact for all categories:** maximum impact or normalized sum of impacts.

Chapter 3: Managing Project Schedules

RiskyProject for Microsoft Project and Oracle Primavera

RiskyProject as a Standalone Application

You can launch RiskyProject directly from the Windows Program menu. When you open RiskyProject, the main Project view appears in which you can enter schedule and risk, perform the analysis, track project performance and report the results.

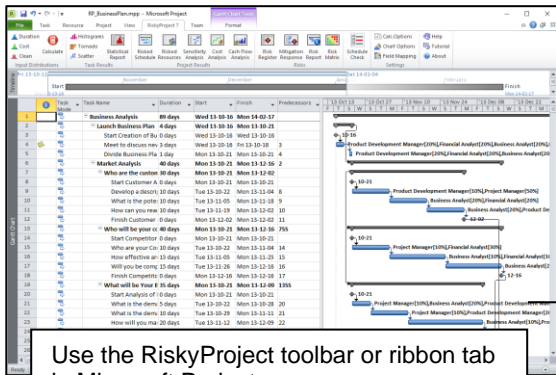
RiskyProject for Microsoft Project

RiskyProject seamlessly integrates with all versions of Microsoft Project from 2010 and later. When you install RiskyProject, it checks if Microsoft Project is installed on the computer. If Microsoft Project 2010 or later is, installed RiskyProject installs ribbon tab and Add-In to Microsoft Project.

Here is how the integration works:

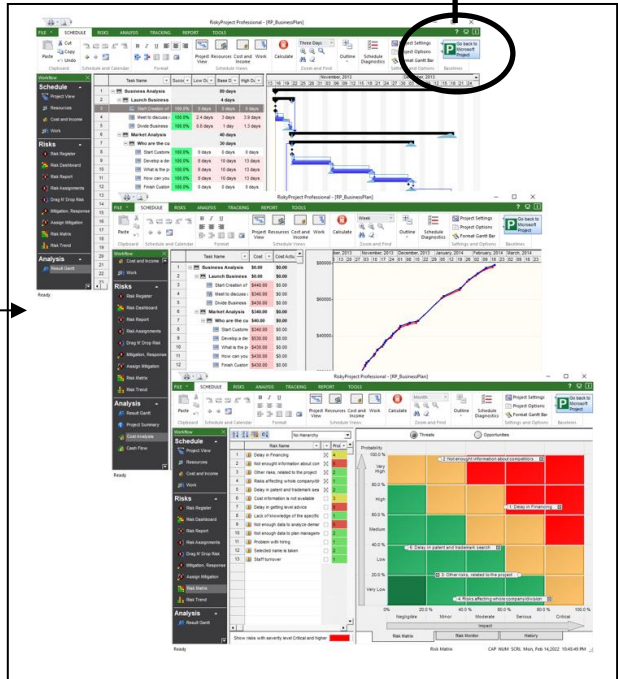
1. The first time you open Microsoft Project after installing RiskyProject for Project, check to see that the RiskyProject ribbon tab is visible. You can enable/disable ribbon tab by clicking on **Options** in the **File** menu. Project Options dialog will open where you can select **Customize Ribbon**. You can also check the installed RiskyProject add-in by selecting **Add-Ins**.
2. Create a schedule in Microsoft Project.
3. Define uncertainties, perform calculation, and analyze results:
 - Define statistical distributions for cost and duration for selected tasks inside Microsoft Project; all statistical distributions are saved in a RiskyProject file.
 - Add risk-related information in the RiskyProject views if necessary: risk events, probabilistic and conditional branching, probabilistic calendars, etc.
 - Perform Monte Carlo simulations
 - View results of analysis and reports in Microsoft Project
4. At any moment, you can go back to Microsoft Project and make changes to your schedule. All changes will be reflected in RiskyProject. However, if you make changes to the deterministic project schedule in RiskyProject, these changes may be overwritten by the Microsoft Project schedule.

Click the **Go Back to Microsoft Project** button in RiskyProject to view original schedule and resources



Use the RiskyProject toolbar or ribbon tab in Microsoft Project:

1. Define statistical distributions for selected task or group of tasks
2. Run Monte Carlo Simulations
3. View results of selected task or group of tasks
4. Open the selected risk view or report RiskyProject.



Microsoft Project

RiskyProject Add-In

- You must save the schedule in Microsoft Project to use the integration between Microsoft Project and RiskyProject.
- Always use the RiskyProject toolbar or ribbon tab in Microsoft Project and Go back to Microsoft Project button in RiskyProject to move back and forth between RiskyProject and Microsoft Project.
- Once you have added risks and uncertainties to your schedule in RiskyProject, they will be always associated with Microsoft Project schedule.
- Once you open a risk view from within Microsoft Project, your Microsoft Project file will be associated with the RiskyProject data file that contains risks and uncertainties for the schedule created in Microsoft Project.
- Links between the Microsoft Project schedule and the RiskyProject file (alm extension) are saved in the registry. If you move the RiskyProject file into a different directory, you will be prompted to browse to find the RiskyProject file associated with the Microsoft Project file.

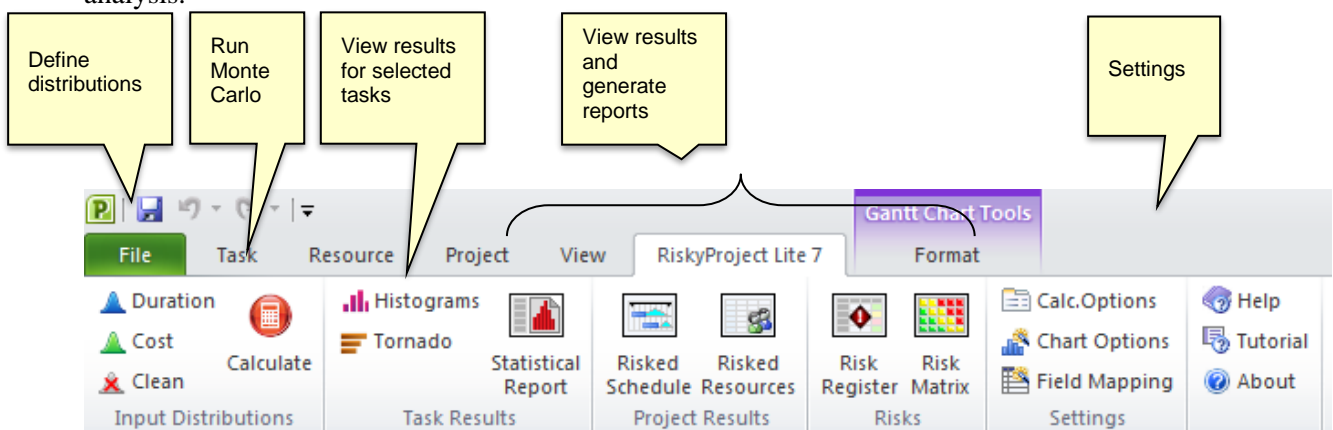


- If you move the Microsoft Project file, the link between Microsoft Project file and RiskyProject will also be broken. In this case, use the command **File > Import > Risks from Another Project** to find the RiskyProject file.

- If you make any changes in Microsoft Project and open RiskyProject using the toolbar or ribbon tab, RiskyProject will reflect the change; however, the risks and uncertainties will be adjusted proportionately. For example, your schedule in Microsoft Project has a task "Project Inception" with a Base duration of 5 days and in RiskyProject you define Low duration as 2 days and High duration as 6 days. If you go back to Microsoft Project and change the Base duration to 10 days, when you return to RiskyProject, the Base duration will be 10 days (the same as in Microsoft Project); however, your Low and High durations will be adjusted proportionately (4 days and 12 days respectively). The same logic is used if you adjust the original fixed costs, work, income, lag, and start times.
- Low, most likely, and high duration and costs are stored in Microsoft Project: duration1, duration2, duration3... Statistical distributions are stored in text fields in Microsoft Project. You must map the duration, cost, and text fields in Microsoft Project to low, most likely, and high duration or cost in RiskyProject using **Field Mapping** settings.
- Some features of Microsoft Project are not supported in RiskyProject. For more information, see [Frequently Asked Questions](#).
- You can make changes to the schedule in RiskyProject. However, RiskyProject does not write these changes, such as task duration or task name, back to the Microsoft Project schedule. Therefore, we recommend that you do not to make any changes to original schedule in RiskyProject. Use RiskyProject to add risks, uncertainties and other risk related information.
- If you want to transfer the original schedule updated in RiskyProject or results of probabilistic analysis to Microsoft Project, use **File > Launch > Microsoft Project**. Please note that RiskyProject is using Microsoft Project XML format. Some scheduling data may not be transferred due to limitations of the XML format.

Using Microsoft Project Add-In

Using the RiskyProject Add-In, you can quickly add Low and High estimates for Cost and Schedule directly to your Microsoft Project file, run the simulation, and view the results of the analysis.



Setting up the Add-In options

You can set up your Monte Carlo calculation, chart, and field mapping options using the Add-In.

- Calculation options include the maximum number of iterations and convergence monitoring and more. To read more about calculation options, read [Setting up calculation options](#).
- Field mappings allow you to modify the default fields where the distributions for duration and cost are saved. To read more about the mapping, read [Mapping custom fields in Microsoft Project to low/most likely/high duration/cost/income/distribution fields in RiskyProject](#)

Adding Low, Most Likely, and High Duration or Cost in Microsoft Project

1. Select one or more activities.
2. Click the **RiskyProject Lite** tab. On the **Input Distributions** group, click **Duration** or **Cost**. The **Statistical Distribution** dialog box opens.
3. Enter in the Low and High estimates using coefficients or fixed values (single activity).
4. Select a distribution and modify any parameters required by the distribution. The “Most likely” estimate is available for Triangular and BetaPert.
5. Click **OK**.

To clean edits made to distributions:

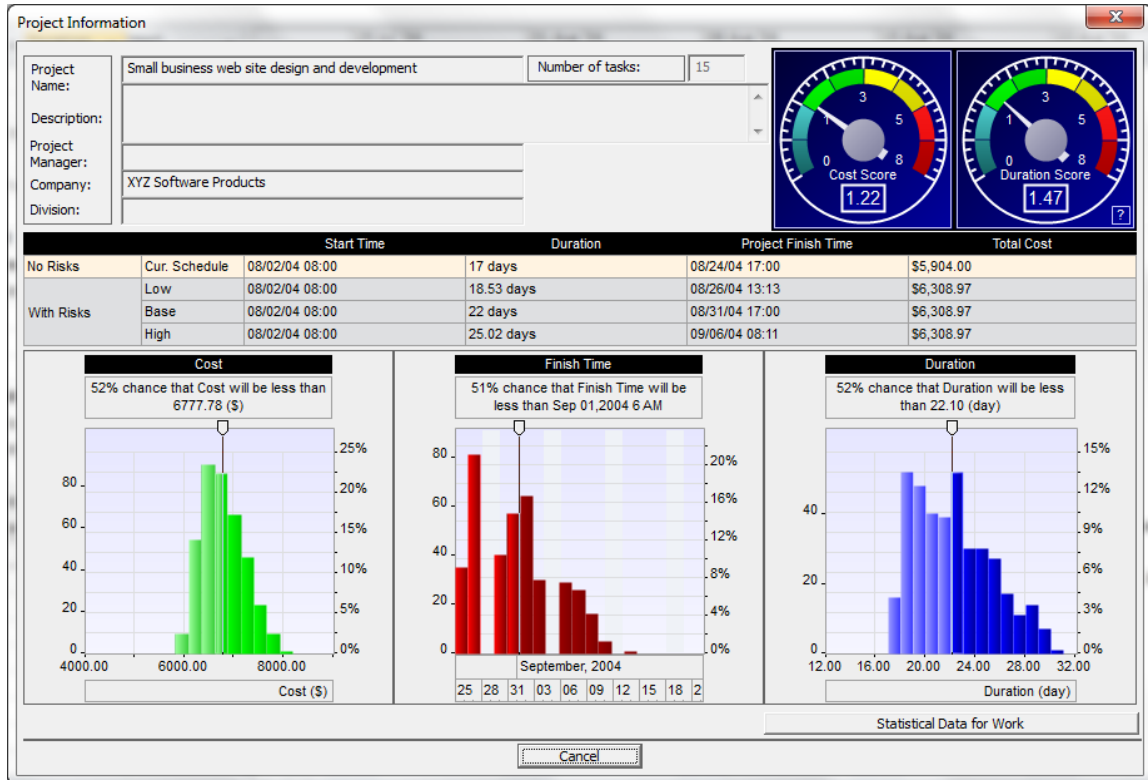
1. Select the task or tasks in which you want to remove the distributions.
2. Click the **RiskyProject Lite** tab.
3. On the **Input Distributions** group, click **Clean**.

Run a Monte Carlo simulation using the Microsoft Project Add-In

Once you have defined the low, most likely, and high estimates and distributions to your activities, you can run a simulation.

To run a Monte Carlo simulation:

1. Click the **RiskyProject Lite** tab.
2. On the **Input Distributions** group, click **Calculate**. A progress bar will open and indicating the number of iterations that have been completed.
3. When the simulations are completed the **Project Information** report opens, which contains a project summary of the results of the simulation.



View the results of the simulation for a task

You can quickly view either histograms or tornado charts for a task. Only one task can be selected.

To view a histogram or tornado chart for a single task:

1. Click the **RiskyProject** tab. On the **Task Results** group, click **Histograms** or **Tornado**. The Task Simulation Results report opens. To read more about these reports, see **Error! Reference source not found.**
2. Double-click on any of the reports to open a detailed view of the results.

Create a statistics report

You can automatically generate a report that includes a histogram, cumulative probability, and sensitivity analysis for one or multiple activities using the Statistics Report. To read more about the Statistics Report, see Statistics Report for Quantitative Analysis.

To create report:

1. Run a simulation.
2. On the **Task Results** group, click **Statistics Reports**. The **Statistics Report** view opens.
3. Select the activities that you want to include in the report.
4. From the **File** menu, click **Print** to open the **Print Options** dialog box.

Running Diagnostics of Microsoft Project Schedule

Diagnostics of Microsoft Project Schedule checks the schedule for logical errors as well as to uncover possible corruptions. Corrupted project schedules often cannot be imported to RiskyProject. To run project schedule diagnostics, click on **Check Schedule** button.



Diagnostics in Microsoft Project is a subset of schedule diagnostics in RiskyProject. It only identifies a few most important errors and does not execute DCMA 14 point schedule inspection

About installing the RiskyProject/Microsoft Project integrated solution

During installation, RiskyProject checks if you have Microsoft Project 2010 or later installed. RiskyProject is not integrated with earlier versions of Microsoft Project using the toolbar. For early versions of Microsoft Project, you must use one of the formats generated by Microsoft Project (XML, or MPX).

Before you install the toolbar or ribbon, close all instances of Microsoft Project. RiskyProject adds the toolbar/macro or ribbon to the last installed version of Microsoft Project.

Information about RiskyProject's ribbon is saved in the system registry. RiskyProject will update these registry settings each time it is launched.

You may also install the integration after RiskyProject is open. Click the **Tools** tab. In the RiskyProject Configuration group, click **Install Integration with Microsoft Project** to install RiskyProject toolbar/macro or ribbon in Microsoft Project.



- You must be an administrator to perform the installation.
 - Your system must have Microsoft .NET framework 2.0 or later installed in order to install RiskyProject for Project. If Microsoft .NET framework 2.0 is not installed, the RiskyProject installer will prompt you to download it from the Microsoft web site and install it on your system.
-

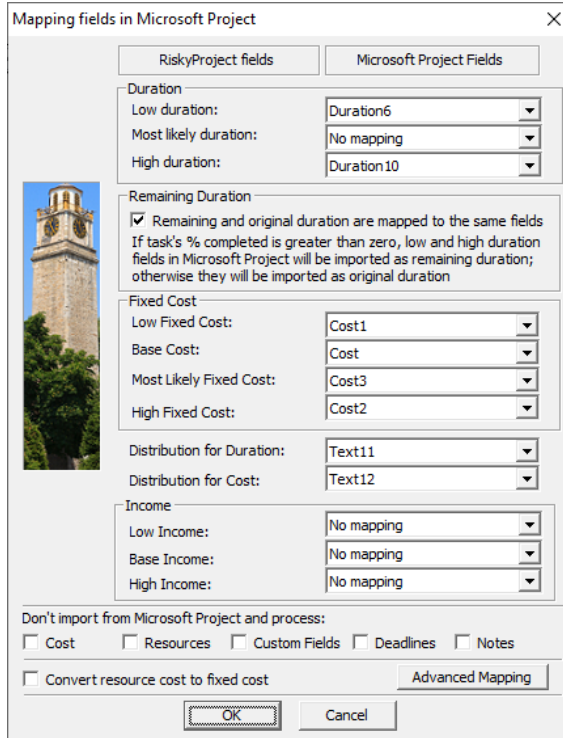
Mapping custom fields in Microsoft Project to low/most likely/high duration/cost/income/distribution fields in RiskyProject

You can use duration or cost fields in Microsoft Project or in any other software that uses Microsoft Project XML schema: duration1, duration2, duration3 ... to define low and high duration in RiskyProject. You can also use duration1, duration2, duration3... fields in Microsoft Project to define low and high **remaining** duration for partially completed tasks.

You can use cost1, cost2, cost3, ... fields in Microsoft Project to define low, base, and high cost and income. Text fields are used to save statistical distribution.

If you previously used Risk+, you may map these fields duration and cost fields the same way as it was done in Risk+. This way you will be able to migrate data related to uncertainties in Microsoft Project from Risk+ to RiskyProject.

To use these fields, you must map them to the corresponding fields in before you import the schedule into RiskyProject. This includes if you are using the RiskyProject toolbar or ribbon in Microsoft Project. The default settings are shown below:



To map Microsoft Project fields:

1. On the RiskyProject Microsoft Project add-in click **Field Mapping** or in RiskyProject, click **File** and then choose **Import > Map Microsoft Project Fields....**
2. Select the Microsoft Project field associated with low/most likely/high duration, cost, and income in RiskyProject.
3. Select if you wish to map remaining duration fields as original duration fields. If remaining duration fields are mapped to the same fields as original duration fields and percent complete > 0, low and high duration fields in Microsoft Project are used for low and high remaining duration in RiskyProject. For example, both original duration and remaining duration are mapped to the same fields:

Microsoft Project XML	RiskyProject
Mapping:	
Duration1 -> Low Duration = Low Remaining Duration	
Duration3 -> High Duration = High Remaining Duration	
Scenario 1: % complete = 0%	
Duration1 = 3 days	Duration Low = 3 days, Low Remaining Duration = 0
Duration = 5 days	Duration = 5 days, Remaining Duration = 0

Duration2 = 7 days	Duration High = 3 days, High Remaining Duration = 0
Scenario 2: % complete = 50%	
Duration1 = 2 days	Duration Low = 5 days, Low Remaining Duration = 2
Duration = 5 days	Duration = 5 days, Remaining Duration = 2.5 days
Duration2 = 4 days	Duration High = 5 days, High Remaining Duration = 4

For remaining duration, you cannot define Most Likely value, only base value will be used for analysis.

4. If you do not want to import from Microsoft Project cost data, resources, cost fields, deadlines, and notes, select appropriate check boxes. It accelerates calculation.
5. If you have cost resources, you may wish to convert cost associated with these resources to the fixed cost during import. You can apply statistical distributions to the fixed cost but cannot do it with cost resources. If you select check box **Convert cost from cost resources** to fixed cost, in RiskyProject cost resource will remain the same as in Microsoft Project, but cost defined in resource assignments will be equal zero.
6. Click **OK**.

Once you define mappings, it will stay in the system registry for all projects transferred from Microsoft Project to RiskyProject.



- These mappings can be used for other scheduling applications that use Microsoft Project's XML format, including Oracle's Primavera. Please note: base fixed cost in Primavera may be saved as Cost1 in XML file. RiskyProject also supports XER file import for Oracle's Primavera.
- If remaining duration fields are mapped to the same as original duration fields and you **changed % complete in Microsoft Project, you must redefine statistical distribution for duration** or update values in duration fields for Microsoft Project.

Advanced Mapping Options

Using advanced mapping options, you may “relax” some constraints in your Microsoft Project schedule while it is imported into RiskyProject. You can also define the location of the temporary file used to import results to RiskyProject.

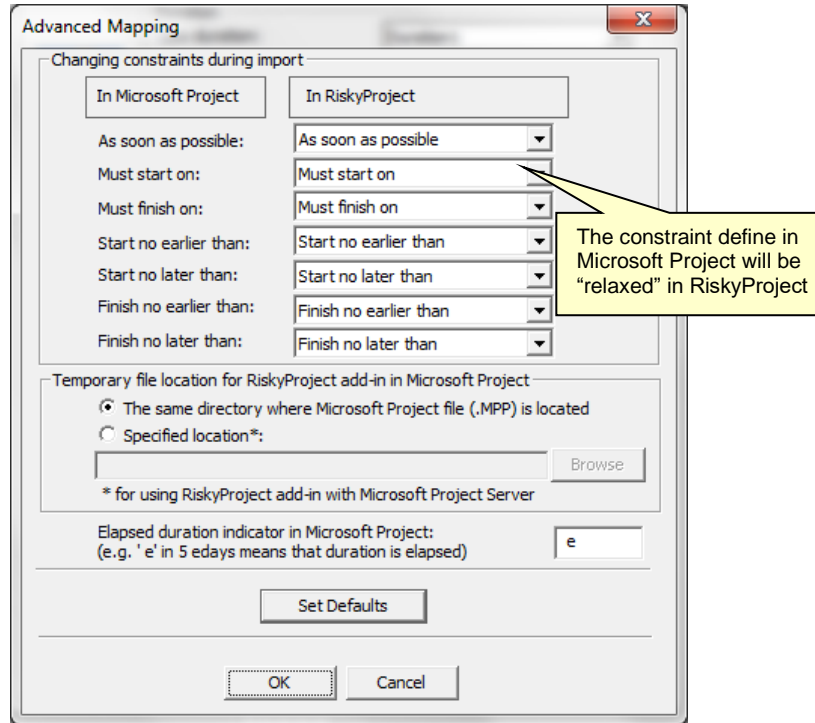


You must define a temporary file location if the original project schedule has been read directly into Microsoft Project from Microsoft Project Server.

To define advanced settings:

1. Open the **Mapping Fields in Microsoft Project** and click **Advanced Mapping**. The Advance Mapping dialog box opens.
2. Select the constraints in the original project schedule you want to modify during import.

3. If your Microsoft Project schedule has elapsed duration, define the prefix for elapsed duration. In the English version, the prefix is 'e' (with space), e.g. '5 edays'. However, in other languages, this prefix may be different.
4. Select the temporary file location for the RiskyProject Add-in in Microsoft Project.
5. Click **OK**.



XER File Import Settings

Mapping user defined fields in XER files to RiskyProject fields

If you are importing an Oracle Primavera *.xer file, you can use user defined fields to import low, most likely, and high estimates for duration and cost by mapping these fields to corresponding fields in RiskyProject. To map user defined fields, you would need to choose an XER file to use as a mapping template.

To map user defined fields in XER:

1. In RiskyProject, click **File** and then choose **Import > XER File Import Settings...**
2. Click **Browse** to select a XER file to be used as a template. RiskyProject reads user defined fields in the file.
3. Select the user defined field associated with low, most likely, and high duration and/or cost.
4. Select units for the duration fields
5. Click **OK**. Once you define mappings, the mappings are saved in the system registry. If you import a file that uses different fields for duration and/or cost, you must update the XER mappings.



You must use number (not text) user defined fields in Oracle Primavera to enter low, most likely duration and cost.

XER File Encoding

XER files do not include any information about what is being used to encode the files. If the file you are importing does not use standard encoding (for example, it uses Russian instead of English), then the characters may not display correctly when you import the file. You need to define encoding before you import XER file.

To define encoding:

1. In RiskyProject, click **File** and then choose **Import > XER File Import Settings**
2. Select XER file encoding: ANSI, UTF-8, or UTF-16LE
3. Click **OK**. Encoding will be saved in the system registry.

Setting up your projects

Setting up your project defaults

Project defaults are global project settings. There are two types of defaults:

- **Project Options** – These options are applicable to a particular project and are saved in the project file. You define project options on the **Schedule** tab, Settings group, Options.
- **Global Options** - These project defaults are applied to all new projects and are saved in the system registry. Global options include default risk properties, default risk outcomes, and default values of project options. You save global options clicking on **Set as default** in the tabs that support defaults in the Options, Risk Outcome, and Risk Properties dialog boxes.

The Options dialog box includes six tabs. Use the:

- **View** tab to setup general project parameters and the appearance of the RiskyProject desktop
- **Duration** tab to define the calculation of task durations
- **Calendar** tab is responsible for the calculation of the project schedule
- **Units** tab defines how time units are displayed or input
- **Calculation** tab to set up default calculation parameters
- **Cost** tab is responsible for default cost parameters and calculation

Setting up viewing defaults

Use the **View** tab to set up general project parameters and modify the appearance of the RiskyProject workspace.

1. Click the **Schedule** tab. In the **Settings** group, click **Options**.
2. Click the **View** tab.
3. Enter the default project information (i.e., **Project Manager**) in the text boxes. You can view them in the Project Results view and Main Project Settings dialog box next time you create new project. The Project Manager box is also used as a default value for risk properties: recorder, owner, and contact.
4. Select the project view that will appear whenever RiskyProject is opened from the Default View list. “***LAST VIEW***” will automatically load the most recently open RiskyProject session.
5. Select or clear the **Show or hide startup view** check boxes to enable or disable the workflow bar, legends, and splash screens.
6. Use **Restore Default Column Layout** and **Set Default Column Layout** to restore and save column sequences and widths for all views.



All viewing defaults are global, so they are applied to all new projects created on this computer.

Setting up duration defaults

Use the **Duration** tab to define the calculation of task durations.

1. Click the **Schedule** tab. In the **Settings** group, click **Options**.
2. Click the **Duration** tab.
3. Select the time units that you will use to enter Duration and Work. Duration and Work can be entered in minutes, hours, days, weeks, and months.
4. Define default value for effort driven flag for new tasks.
5. Select how low and high durations will be calculated:
 - Absolute values can be added (subtracted) to the Base Duration.
 - High and low durations are calculated by multiplying the Base duration with a coefficient. You must enter the coefficients.
 - Internally all calculations in RiskyProject are in hours. The units you select are only for data entry and display.
 - By default, Low, Base, and High durations are the same. This is important as RiskyProject recommends that you use Risks to calculate task durations rather than a range of uncertainty.
 - Low and High can represent a different uncertainty range depending upon the distribution that you apply. For **uniform** and **triangular** distributions, **Low** and **High** represent the minimum and maximum duration. For **normal** and **lognormal** distributions, the range can be P1/P99, P5/P95, or P10/P90, which you define in the **Distribution** tab of the **Task Information** dialog for each particular task.

Setting up calendar defaults

In the Calendar tab, you set up the default calculations for project schedules. Actual project calendars are set up in the Working Time dialog box. The specific calendars and type (Deterministic or Probabilistic) are set up in the Main Project Settings.

1. Click the **Schedule** tab. In the **Settings** group, click **Options**.
2. Click the **Calendar** tab.
3. Enter in the daily, weekly, and monthly translation values in the fields provided.
4. Select the date format in the **Output Date Format** box.
5. Enter a default start date for tasks in the **New Task** box. New tasks can be started on current date or default start date. Default start date is defined in **Schedule** tab > **Project Settings** > **Project Start Time**. If new task supposes to start on current date and different date is defined in Project Start Time of Main Project Settings dialog, new task will be constrained **Start not early than**.
6. Use the **Show Deadlines** and **Show Resources** on the Gantt chart check boxes to modify what you want to view on the Gantt chart.



Input date format is always MM/DD/YY. For example, if task start time or finish time is December 31, 2010, you should enter it as 12/31/10

Setting up project units

You define how time units are entered and displayed in the **Units** tab.

1. Click the **Schedule** tab. In the **Settings** group, click **Options**.
2. Click the **Units** tab.
3. Select the labels that you want to use for each time unit. These labels will be used for entering rates or for results. However, they are not used for entering duration. Duration units are defined in the **Duration** tab
4. Select the **Add space before label** check box to add a space between the data and label. For example: **5 days** vs. **5days**
5. Click the Set as Default button to set these as the default project settings

Setting up calculation options

Setting up calculation defaults

You define default calculation parameters in the **Calculation** tab.

1. Click the **Schedule** tab. In the **Settings** group, click **Options**.
2. Click the **Units** tab.
3. Select the default calculation option from the **Default Calculation for Projects**.
4. Enter the maximum number of simulations that will be run in the **Maximum number of simulations** box.
5. Enter the convergence parameters in the boxes provided. Simulations can be stopped when the convergence criteria are met.
6. Select the meaning of low and high results. For example, if you check P10 and P90 it will mean that low start time result of the simulations is actually in the 10th percentile of the distribution. You can choose a specific percentile for Low and High results. For example, P30 will be associated with low results and P70 will be associated with High results.
7. Select **Critical Path Calculation** to view critical path and analyze critical path metrics, such as Late Start and Late Finish, Free Slack, Total Slack, and Criticality Index. Enabling Critical Path Calculation will slow down Monte Carlo simulations.
8. Define minimum sensitivity coefficient for sensitivity view. If a sensitivity coefficient is less than the defined value, it will appear as zero in the sensitivity view. For example, minimum sensitivity coefficient is 0.16. A sensitivity coefficient for a particular task's duration and project duration equals 0.1. Sensitivity coefficient for this task will be set to zero and this task will not be ranked in the sensitivity view.

Defining the maximum number of simulations

Based on our experience with real project schedules, the results converge normally between 400 and 700 simulations. However, in projects where there are risks with a very small change of occurrence, the number of simulations should be increased. For example, if there is risk with

chance of occurrence of 0.1%, the number of simulations should be at least 1200. The maximum number of simulations is 30000.



- The number of tasks and number of simulations define small projects. RiskyProject automatically adjusts the definition of a small project based on your computer's performance.
- If Monte Carlo simulations are not performed automatically, you can perform them at any time by clicking the **Calculate** button on the ribbon.

Setting up cost defaults

You define fixed cost defaults in the **Cost** tab. When you create tasks, RiskyProject uses these parameters for tasks (fixed costs) and resources (variable costs).

1. Click the **Schedule** tab. In the **Settings** group, click **Options**.
2. Click the **Cost** tab.
3. Enter in the scalar factors used to calculate default low and high fixed costs
4. Enter in the default rate for variable costs in the **Variable Cost** box. This is used when new work or material resources are created
5. If you want RiskyProject to calculate actual cost and income based on percent for work done (tracking information), click the **Actual costs are always calculated by RiskyProject** check box. Otherwise, you can manually enter actual data in Cost and Income view.
6. Select the **Currency symbol** and **format** for any field with currency.
7. Enter default **type of cost and income accrual**. Cost and income accrual can be at the start of the task, or at the end of the task and prorated.
8. Enter **Default Discount** rate for NPV calculation. This discount rate is used in Cash Flow view.



- If you define a distribution for cost using low, base, and high values and assign a risk for cost to the same task, this may cause a double count of the same risk factors.
- You can use any currency symbols, except for numbers, commas, and periods.
- You must define the particular unit for the default rate e.g. "hr" in the **Units** tab of the **Options** dialog box. By default, this unit is hours.

Setting up Calendars

About Calendars in RiskyProject

There are four types of calendars in RiskyProject: base calendars, project calendars, resource calendars, and task calendars. They are used to determine resource availability, resource scheduling, and task scheduling. Project calendars and task calendars are used to schedule tasks, and if resources are assigned to tasks, resource calendars are used as well.

You can modify these calendars to define the working days and hours for the whole project, for groups of resources, for individual resources, and for tasks. These calendars are distinct from the Calendar view, which shows the project schedule in a calendar format.

Base calendars

A base calendar is used as a template that the project calendar, resource calendars, or task calendars are based on. It defines the standard working and nonworking times for the project. It specifies the work hours for each workday, the workdays for each week, and any exceptions, such as holidays. You can select a base calendar to use as the project calendar or as the basis for a resource calendar. You can also apply a base calendar to specific tasks.

RiskyProject has five default base calendars:

- **Standard:** The Standard base calendar reflects a traditional work schedule: Monday through Friday, 8:00 A.M. to 5:00 P.M., with an hour off for break.
- **24 Hours:** The 24 Hours base calendar reflects a schedule with no nonworking time. The 24 Hours calendar can be used to schedule resources and tasks for different shifts around the clock, or to schedule equipment resources continuously.
- **Night Shift:** The Night Shift base calendar reflects a graveyard shift schedule of Monday night through Saturday morning, 11:00 P.M. to 8:00 A.M., with an hour off for break.
- **Morning Off:** The Morning Off base calendar reflects a schedule Monday through Friday, 1:00 P.M. to 5:00 P.M., without breaks.
- **Afternoon Off:** The Afternoon Off base calendar reflects a schedule Monday through Friday, 8:00 A.M. to 12:00 P.M., without breaks.

You can also create your own base calendar, which is useful if you have alternative schedules for multiple resources. For example, you might have resources working part-time, 12-hour shifts, or on weekends.

Creating or modifying a base calendar

Base calendars can be created or modified in the **Working Time** dialog (ribbon's **Schedule** tab, schedule and calendar pane):

1. Click the **Schedule** tab. In the **Schedule and Calendars** group, click **Working Time**.
2. Click the **New** button to create a new base calendar, the **Delete** button to remove base calendar, or the **Rename** button to rename base calendar
3. Use the Working Time calendar options to modify the selected base calendar. Choose **Working Time** from **Schedule** tab.

Project calendars

The project calendar defines the working and nonworking days and times for tasks. This calendar usually represents your organization's traditional working hours. RiskyProject uses this calendar

to schedule tasks that do not have resources assigned. By default, the Standard base calendar is used as the project calendar, but you can reflect alternative schedules by using other base calendars.

The working days and hours in the project calendar reflect the working days and hours for your whole project. You can specify special days off, such as company holidays.

Project calendar can be deterministic and probabilistic. Probabilistic calendars are useful for modeling uncertain scheduling conditions such as weather. Both deterministic and probabilistic project calendars can be selected from the list of available calendars in the Project Settings dialog (Schedule tab).

Resource calendars

Resource calendars make sure that work resources (people and equipment) are scheduled only when they are available for work. They affect a specific resource or category of resources. By default, the working time settings in the resource calendar match the project calendar. However, you can customize the resource calendar to show individual schedule information, such as vacations, leaves of absence, or equipment maintenance time.

When you create a resource, the default resource calendar will be created. You can view this resource calendar in the **Working Time** dialog box. By choosing **Working Time** from the **Schedule** tab, you can edit resource calendars to indicate nonworking time. You can also create or assign different base calendars for individual resources to indicate specific working hours. For example, you can assign a resource to a calendar that you created for carpenters who may be working during a time that is different from other workers. You can edit Base calendars for each resource in the **Working Time** dialog box.

When RiskyProject schedules the project, it uses the resource calendar to schedule the tasks that have resources assigned. For example, if a resource has a week of vacation specified on his or her resource calendar, RiskyProject will not schedule the task for that week.



If you have resources that work alternative schedules, such as part-time or the night shift, we recommend that you set up and apply a separate base calendar for each shift. You should use resource calendars to accommodate exceptions to an individual resource's working times.

Task calendars

Task calendars make it possible to schedule tasks during nonworking time, as defined by the project calendar or resource calendar. For example, you can set up a task calendar if you have a task that needs to be worked on overnight or through the weekend.

You create a task calendar in the **Working Time** dialog box as a new base calendar. You can then apply the base calendar to a task by using the Advanced tab in the Task Information dialog box.

If you have applied a task calendar to a task that already has assigned resources, by default, the task is scheduled for the working times of resource calendars. If you want to schedule the task by using only the task calendar, select the **Ignore Resource Calendars** check box on the Advanced tab in the Task Information dialog box.

Defining working time

RiskyProject allows you to define multiple calendars. All calculations are done internally in hours and minutes.

1. Click the **Schedule** tab. In the **Schedule and Calendars** group, click **Working Time**.
2. Select a calendar from the **Calendar** list. There are five calendars provided:
 - **Standard**
 - **Morning Off**
 - **Afternoon Off**
 - **24 hours**
 - **Night Shift**
3. If you need to modify the selected calendar, click on a day in the calendar. The working and nonworking time is displayed in the schedule on the right. You can define working for specific weekday. To do it just click on weekday and modify working times for the weekday. You may also specify working time for the specific day. To do it just click on specific day and modify working times.
4. Click on an hourly period to set it as working or nonworking time. **White** is working, **pink** is nonworking.
5. Once you have completed the calendar, click **OK** to save the changes.

Creating a new calendar

You can create a new calendar and save it under a new name.

1. Click the **Schedule** tab. In the **Schedule and Calendars** group, click **Working Time**.
2. Click the **New** button. The **New Calendar** dialog box opens.
3. Provide a name for the calendar and description.
4. Select the base calendar from the **Based on** drop-down list.
5. Click **OK**.
6. Modify the new calendar as needed.
7. Click **OK** to save the new calendar.

Renaming a calendar

You can rename calendars that you have created.

1. Click the **Schedule** tab. In the **Schedule and Calendars** group, click **Working Time**.
2. Select the calendar that you want to rename from the **Calendar** drop-down list.
3. Click the **Rename** button. The **Rename Calendar** dialog box opens.
4. Type in a new calendar name.
5. Type in a note for this calendar (optional)
6. Click **OK**.



When you use any calendar other than the **Standard**, ensure that you properly translate the duration through the project. To define **hours per day**, **hours per week**, and **days per month** go to **Tools > Options** and select **Calendar** tab.

Deleting a calendar

You can delete calendars that you have created.

1. Click the **Schedule** tab. In the **Schedule and Calendars** group, click **Working Time**.
 2. Select the calendar that you want to delete from the **Calendar** drop-down list.
 3. Click the **Delete** button.
-



- You cannot delete the **Standard**, **Morning Off**, **Afternoon Off**, and **24 hours, Night Shift** calendars. All other base calendars can be deleted as long as they are not used for resource, task, and project calendars.
 - Resource calendar will be deleted automatically, when you delete the resource and this calendar is not used for other resources.
-

Creating Projects

Creating a new project

The original view for a new document is defined in the **Options, View** tab. The default view can be the last view in the previous RiskyProject session.

1. Click **File** and then **New**. The new project file opens.
2. To save the project click the **Save** button and type in a project name.



In addition to project files created in RiskyProject, you can also open files that have been saved as a Microsoft Project XML and Oracle Primavera XER format. Microsoft Project XML is the industry standard for project management software and is supported by Microsoft Project, Oracle Primavera, and many other project management software applications.

Importing existing project schedules

You can import existing project schedules from Microsoft Project, Primavera and other project management tools using a variety of file formats.

Importing Microsoft Project files

You can import MS Project files using XML format.

1. Click **File** and then **Open**. The **Open File** dialog box opens.
2. Select the format that the project file is in from the **Files of type** drop-down list.
3. Select the MS Project file format that you just saved.
4. Click **OK**.



You can use the RiskyProject toolbar or ribbon in Microsoft Project to transfer your schedule from Microsoft Project to RiskyProject. When you use the RiskyProject toolbar or ribbon, your schedule in Microsoft Project will be associated with risks and uncertainties defined in RiskyProject. Please read "RiskyProject for Microsoft Project" for more information.

Importing data from other project management software

RiskyProject can import data from other project management software in Microsoft Project XML and Oracle Primavera XER file formats.

1. Click **File** and then **Open**.
2. Select the XML or XER project schedule.



Due to the specific features of each application and the probabilistic nature of RiskyProject data, in very rare cases there may be discrepancies between the original project schedule and the imported

schedule in RiskyProject.

Importing data from other project management software and retaining risk assignments

Sometimes you may want to import a project schedule from Microsoft Project or other software and retain existing risk assignments. It can be useful when you have imported a project schedule from Microsoft Project or other software, assigned risks in RiskyProject, and then updated the project schedule in Microsoft Project.

1. Click **File** and then **Import**.
 2. Select the format type of your project data (XML or XER).
 3. Select whether or not you want to import the risks already assigned to the project.
-



RiskyProject will associate assigned risks with new tasks based on unique task IDs. Unique IDs do not change when you insert or delete tasks. You can rename the task in Microsoft Project, but risks will be assigned to the proper task and resource based on this unique ID.

Importing risks and uncertainties from different RiskyProject file

You can import risks and uncertainties from a different RiskyProject file and assign them to tasks and resources in the current schedule.

1. Click **File** and then **Risks from Another Project**.
 2. Select the RiskyProject file (alm extension) with risks and uncertainties.
-



If the schedule originated in Microsoft Project, the risks will be assigned to the correct task and resource using the unique ID. Unique IDs do not change when you insert or delete tasks. If you created the schedule in the RiskyProject the risk will be assigned based to the tasks or resources based on ID shown in the task or resource data sheets. Such ID changes when you insert or delete tasks.

Project Settings

The Project Settings are where you enter general project information, project deadlines, and set the project calendars. Project settings can be defined by clicking on **Main Project Settings** (**Schedule tab, Settings and Options** group).

General Project Information

General project information includes:

- Project Name
- Project Manager
- Project Description
- Company
- Group/Division

This information will be shown on the Project Summary view as well as on reports. The Project Manager name will be used as a default value for risk properties: recorder, contact, and owner. Default values for these parameters are defined in **Tools >Options** view tab.

Project Start Time

Project start time is entered or edited in the **Main Project Settings** dialog box. Project start time is always deterministic. You change project start date and all project schedules will shift.

Project Status Date

Project status date is entered or edited in the **Main Project Settings** dialog box. Status date is used to report project's progress on this day you set. In RiskyProject project status dates is used for project diagnostics, particularly for the DCMA 9A, DCMA 9B, DCMA 11, DCMA 13, and DCMA 14 tests.

Project Calendar

Project calendar is used for scheduling tasks if task or resource calendars are not defined. Default project calendar is Standard.

Maximum project duration is working time (not calendar time). For example, one-month maximum project duration is 20 working days. It is done to make maximum project duration consistent to duration of any task.

- Earliest Project Deadline: Jan 1,2008
- Latest Project Deadline: Jan 1,2011

In this example, the projected the probabilistic calculation will not proceed.

Project Tasks

When you first start RiskyProject, the Project view opens. Start the scheduling process by adding tasks. Each task should have a name and a base duration. You can enter this information directly onto the datasheet or using the Task Information dialog box.

Opening the Task Information dialog box

The **Task information** dialog box can be used to enter task parameters (duration, start, finish times, assign resources to tasks, assign risks, etc.). You can open the task information dialog using one of the following ways:

- Double-click on Task ID
- Right-click on task ID and Select Task Information
- Select Task and Click on **Project > Task Information**

Entering task name and duration

When you create a task, the first step is to enter a name and a base duration.

1. Click on the **Task Name** field in the **Project** view.
2. Provide a name for the task.
3. Enter a base duration in the **Base Duration** field. You can enter elapsed duration. Elapsed task duration is calculated using a 24-month calendar. To define elapsed duration, enter ‘e’ before units, for example, “10 edays”.



The default Start Time for tasks is defined in the Calendar tab of the Options dialog box. The start time can be either the current date or a project start date, defined in Project > Main Project Settings. You can always change start time using constraints (see Start, Finish Times and Constraints). You can also change other default parameters in the Options dialog box.

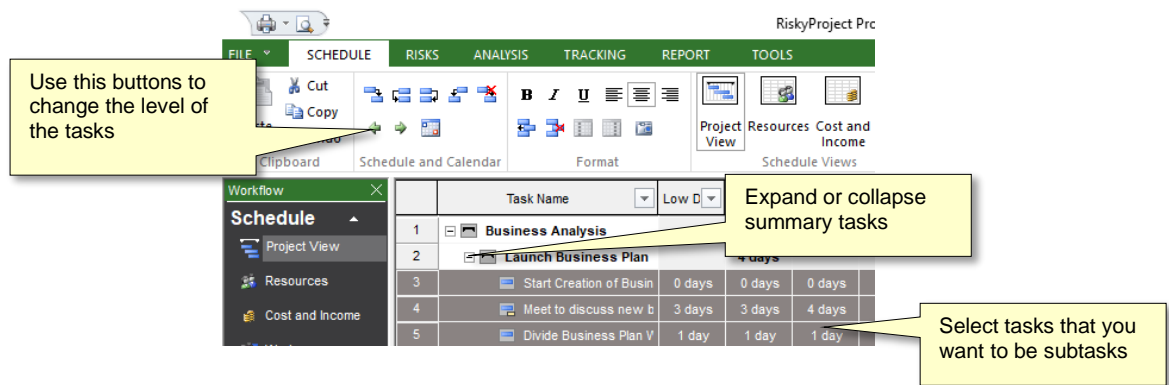


Define task durations using the **Base Duration** column. Once you have added all of the tasks, you can add uncertainties by assigning low and high durations. See **Define Distributions for Start Time, Cost, and Duration** for more information.

Defining summary tasks and subtasks

Summary tasks represent groups of tasks (subtasks) that can be logically grouped together under a larger task. In large projects with many tasks, this is a useful method of organizing your tasks.

1. Create a task directly above the tasks that you want to group under it. This will become the **Summary Task**.
2. Select the tasks that you want to be the subtasks of the summary task you created in step 1.
3. Click the **Indent** button located on the **Format** toolbar to indent the tasks. The indented tasks are automatically recognized as subtasks of the summary task. If you want to move a task out from under the summary task, select the task and click the Outdent buttons. After you click on an **Indent** or **Outdent** button, RiskyProject automatically recalculates the project.



Outline Selected Level

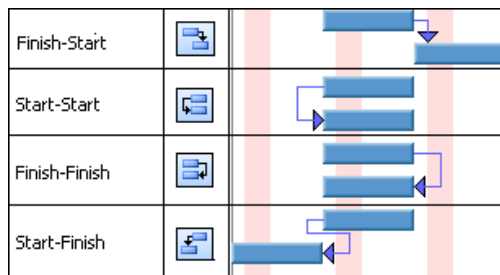
You may view summary tasks associated with a particular level of the hierarchy using the Outline button (Schedule tab).

Task Links

All projects require that the WBS tasks be performed in a certain order. These relationships are defined in RiskyProject using the four linking buttons located on the standard toolbar.

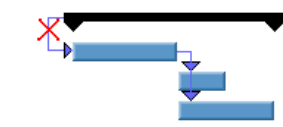
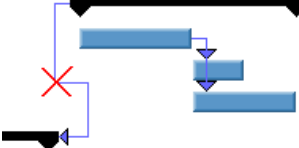



The four types of task dependencies are show in the following figure:



If you want a next task to be a predecessor of a previous task, for example task 5 to be a predecessor of task 3, you will have to use Predecessors tab in Task Information dialog box. You can also use the Predecessors tab if you want to define lags time greater than zero.

Remember the following rules:

<p>1. You cannot link summary task to one of its subtasks</p>	
<p>2. The predecessors of a summary task must have a finish-start or start-start dependency.</p>	
<p>3. You cannot create circular relationships.</p>	

The connecting line between successors and predecessors will be red if there is a scheduling conflict:



Predecessors and Lags

You define information about predecessors and lags in the **Predecessor** tab of **Task Information** dialog box.

You can use the **Standard** toolbar button to link tasks; however, this method of creating task dependencies has limitations:

- You cannot link a task (from example Task #5) to a previous task (for example Task #3).
- You cannot input lag, which is time delay between predecessor and successor.
RiskyProject allows you to setup probabilistic lag with statistical distribution defined by low, base, high number.



Sometimes it is convenient to use predecessor tab instead of link toolbar buttons when task has multiple predecessor or if there is a big difference in task Ids between current task and predecessor. For example, it is not convenient to link task number 5 to task number 74 using toolbar buttons.

You can use Predecessor column within Project view to define or modify predecessors. Text: "1, 2+2 days" would mean than current task has two predecessors (Task 1 and Task 2 with lag 2 days).

Adding a predecessor to a task

1. Select the task to which you want to add a predecessor.
2. Open the **Task Information** dialog box.

3. Click the **Predecessor** tab.
4. On the first row of the grid, click in the **Task Name** cell. A drop-down list appears containing a list of all available tasks or type
5. Select the predecessor from the drop-down list. By default, the predecessor type is **Finish-Start (FS)**.
6. If required, enter a **lag** time. Use the **Lag low** and **Lag high** cells to enter a range of time. Lag can be positive or negative
7. If you are entering a base, high and low lag, you can change the default distribution using the drop-down list in the distribution cell.
 - If the low and high lags are different, the default distribution is triangular.
 - If low, base, and high lag are the same the distribution is undefined.
8. If required, edit the **Seed** number. **Seed** is the starting parameter used for the random number generation that is used to calculate lag. If you have two predecessors, and they have strong positive correlations between their lags, you can make their seeds the same. For example, a low lag for one predecessor will coincide with a low lag for another predecessor.
9. Click **OK**.



-
- You cannot make a task be a predecessor to itself
 - You cannot create a schedule that it will lead to a circular relationship between tasks
 - You cannot link a summary task to one of its subtasks
 - You cannot link two tasks twice.
 - You can have two predecessors (SS and FF) to the same task.
-

Constraints

Constraints are limitations that you set on tasks. For example, you can specify that a task must start on a particular date or finish no later than a particular date. In RiskyProject, you can assign one of seven constraints to a task:

- As soon as possible (default)
- Start no earlier than
- Must start on
- Must finish on
- Start no later than
- Finish no earlier than
- Finish no later than

Summary tasks have only “As soon as possible” and “Start no earlier than”.

Use the **General** tab of **Task Information** dialog box to add or modify constraints. If you set a constraint to Start no Earlier Than, an additional edit box opens in which you set the date for this constraint.

If you assign a constraint other than **As Soon As Possible**, the background color for low, base, and high Start Times or low, base and high Finish Times changes to orange to indicate that the constraint is other than **As Soon As Possible**.

A red dot indicates that the constraint is not set to As Soon As Possible, Must start on and Must finish on

Shading constrained time (rather than As Soon As Possible)

	Task Name	Base Dur	Start	Finish
1	Development	5 days	12/21/16 08:00	12/27/16 17:00

Use constraints to ensure that the task starts or finishes on the specific dates. Use caution when you link tasks with a constrained start or finish time with predecessors because of the potential for scheduling conflicts. In this situation, to avoid scheduling conflicts, set the constraint to **As Soon As Possible**.

Constraints affect both probabilistic and deterministic calculations. If you change the Low or High Start times, the constraint is set to Must Start On, similar to when you change the Base Start time.



- When a task has a constraint other than As Soon as Possible, it may not shift due to the nature of Monte Carlo calculations, even if predecessors have risks and uncertainties. Therefore, use caution when planning to perform probabilistic calculations with constraints.
- When you enter the actual start date of the task as part of tracking input, task would become constrained for the probabilistic calculation only. Start time will not change regardless of risks and uncertainties for predecessors.

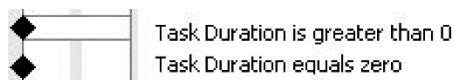
Adding constraints

Before you add a constraint, you should define the task name and duration.

1. Double-click the task to which you want to add a constraint.
2. Click the **General** tab.
3. From the **Constraints** drop-down list, select a constraint that you want to add to the task.

Milestones

You can flag a task as a milestone. If you turn on a milestone, the task bar within a Gantt chart is displayed as:



Any task with zero duration is automatically displayed as a milestone in the Gantt chart; however, any task can be marked as a milestone. The milestone flag is for display only and does not affect the project calculations.

If a task has no duration entered, it is automatically displayed as a milestone, and you do not have to complete the following steps. If you want to flag a task that has duration, complete the following steps.

Creating a milestone

1. Select the task that you want to flag as a milestone.
2. Open the **Task Information** dialog box.
3. Click the **Advanced** tab.
4. Select the **This task is a milestone** check box.
5. Click **OK**.

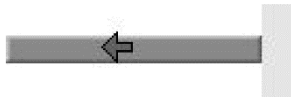
Task Deadlines

You define task deadlines in the **Deadline** Tab of **Task Information** dialog box.

The Actual task deadline is defined by two factors: the maximum task duration and the task deadline. The Actual task deadline is a minimum of two numbers: task start time + maximum task duration and task deadline.

Three different actions can occur when a task deadline hits its deadline:

- **No Actions:** A red deadline arrow is displayed on the Gantt chart for all views, but it will not affect the calculation.



- **End task:** The task duration is reduced, but the task is not canceled.
- **Cancel task:** The task duration is reduced, and the task is canceled.

-
- Deadlines do not affect the results of the deterministic calculation (for the current schedule); however, a red deadline arrow is shown on all views that include a Gantt chart. You can turn display of the deadline arrows on and off in RiskyProject Options (Calendar tab).
 - If the actual deadline occurs on a non-working time, it is moved to the nearest previous working time.
 - When a task reaches the deadline when it is assigned the **Cancel Task** option, the task is canceled. However, task duration, start and finish times are different on different iterations due to the risks and uncertainties. Therefore, the task can reach the deadline in one iteration and not another. RiskyProject calculates task success rate based number of iterations where the task has been successfully completed. Deadlines are one of the examples of Event Chains where events on one task (e.g., restart or delay) may cause another event (cancellation because deadline has been reached).
 - Example: Task deadline is October 17, 2009. At the finish of the Monte Carlo simulations, the finish time of the task was less than October 17, 2009, 100 times and greater than October 17, 2009 150 times. A “Cancel task” result was set for the task deadline. Task success rate will be 40%.
-

Adding a deadline to a task




1. Select the task to which you want to add a deadline.
2. Open the **Task Information** dialog box. Click the **Deadline** tab.
3. Enter in the Maximum duration in the **Maximum task duration** boxes.
4. Select the time unit from the drop-down list.
5. Click on the **Task Deadline** box. A calendar opens.
6. Select a date from the calendar.
7. Select an action that will occur if the task reaches the deadline from the **Action for Probabilistic Calculation** option box.
8. Click **OK**.

Subprojects

You can insert a subproject to the project as a single task with uncertainties. It can be useful when you have a large integrated project, which include subprojects with risks and uncertainties. You can calculate each subproject separately and insert these subprojects with results of Monte Carlo simulations to the master project. Statistical distribution of project cost and duration will become custom input distribution for the task that represents subproject. This approach can significantly simplify schedule and accelerate Monte Carlo simulations on very large programs.

To insert subproject to the master schedule:

1. Open the subproject, run the simulation, and save. The subproject simulation results are saved to the file.
2. Open the file that will be the master schedule.
3. Select the row in the schedule where you want to insert the subproject.
4. Right click on task ID and from the shortcut menu choose Insert Subproject...

3	 Task2	5 days	5 days	5 days
4	 Subproject1	4.1 days	6.52 days	10.83 days
5	 Task3	5 days	5 days	5 days

Right click on task ID to insert subproject above selected task

5. In the **Open** dialog box, navigate to the project you want to insert and click **Open**. The subproject will be inserted as a single task to the schedule.

- Custom statistical distributions for task fixed cost and duration will be defined if subproject has results of Monte Carlo simulation. You can verify them in Distribution tab of task information dialog. Low, base, and high fixed cost and duration of this subproject task will be also defined based on results of simulations.



- Start time of new task will be set based on start time of the subproject. The constraint will be set to "Must Start On". You may remove this constraint and define predecessors and successors of this subproject.



- You can insert any number of subprojects. The subproject may contain nested subprojects.
- You can assign risk events to the subproject task. However ensure that these risks are not assigned in the subproject schedule. Otherwise this will cause a double count of the same risks.
- Subprojects start and finish must be linked to tasks in master project schedule. If internal tasks of a subproject are linked to master schedule tasks, you may need to split one subproject into one or more smaller subprojects.

Refreshing Subprojects

If you run a new simulation on a subproject, it can be updated in the master schedule. You can update manually, or it can be updated automatically when you open the master schedule. You can define the refresh mode in Advanced tab of the **Task Information** dialog box. Manual mode is the default setting.

- **Manual refresh:** click the **Refresh** button Low, Base, High fixed cost and duration, as well as statistical distributions of fixed cost and duration of the subproject task will be updated.
- **Automatic refresh:** select this to automatically update when you open the master project. Automatic mode will increase the time it takes to open master projects.



If your subprojects contain other subprojects, only subprojects at the next lower level will be refreshed. To refresh nested subprojects, open each individually and refresh them.

For more information about refreshing subproject please see **Advanced Task Management**.

Advanced Task Management

Use the Advanced tab on the Task Information dialog box to enter, review, or change supplemental task information. You can:

Specify the task type: A characterization of a task based on which aspect of the task is fixed and which aspects are variable. There are three task types: Fixed Units, Fixed Work, and Fixed Duration. The default task type in the Project is Fixed Units. See Task Types on page 93.

Specify the task calendar: The base calendar that you can apply to individual tasks to control their scheduling, usually independent of the project calendar or any assigned resources' calendars. By default, all tasks use the project calendar. You can select to ignore the resource calendar. Use the Working Time dialog box to modify calendars.

Mark the task as effort-driven: In effort driven scheduling the duration of a task shortens or lengthens as resources are added or removed from a task, while the amount of effort necessary to complete a task remains unchanged.

Change link to subproject, refresh link and define refresh mode: You can change a path to the subproject, which will also allow you to replace the linked subproject. You can also define the refresh mode: **manual** or **automatic** See **Subprojects** for more information.

Task Types

The three task types used in Project are:

- **Fixed units:** Fixed unit is a fixed value and any changes to the amount of work or the task’s duration do not affect the task’s units. It is a default task type.
- **Fixed work:** Fixed-work task is a task in which the amount of work is a fixed value and any changes to the task’s duration or the number of assigned units [or resources] do not affect the task’s work.
- **Fixed duration:** Fixed duration task is a task in which the duration is a fixed value and any changes to the work or the assigned units are not affected.

Each of the task types affects scheduling when you edit one of the three elements as follows.

Task type	Change Units	Change Duration	Change Work
Fixed units task	Duration is recalculated.	Work is recalculated.	Duration is recalculated.
Fixed work task	Duration is recalculated.	Units are recalculated.	Duration is recalculated.
Fixed duration task	Work is recalculated.	Work is recalculated.	Units are recalculated.

Formatting Gantt Bars

You can adjust the shape and color of Gantt for specific tasks or for specific types of tasks: standard tasks, summary tasks, critical tasks, milestones, etc.

Formatting Gantt Bars for All Tasks

- Click the Schedule tab. In the **Settings and Options** group, click Format Gantt Bar.

Formatting Gantt Bars for Selected Tasks

1. Select task or a group of tasks
2. Right-click on Task ID and choose **Format Bar...**

Managing Resources and Work

Resources are the people and equipment that are assigned or the material that is used to complete a task.

Adding resources

1. Click the **Schedule** tab. In the **Schedule Views** group, click **Resources**.
2. Click on a row.
3. Provide a **Name** (mandatory), **Initials** (optional), and **Rate** (mandatory).
 - You can group resources to define reams using the indent and outdent buttons.
 - Initials and notes are for information only and do not affect the calculations.
 - Rates affect the cost the task to which the resource is assigned. Rates for work resources can be per year, month, week, day, hour and minute. Rates for material resources are per unit (e.g., 10 tons).
4. Select the resource type: **Material**, **Cost** or **Work**.
 - Material label indicates type of material resources (e.g., tons)
5. Maximum units are used to calculate Overallocation of work resources. It is not used for the material or cost resources.



- Use the **Resource Information** dialog box to assign resources risks.
- You can add risks to a resource using the **Risk tab** of Resource Information dialog box. If you have only a few risks assigned to a few resources, this is the preferred method to define resource risks. If you have many resources, we recommend that you add the risks in the Risk Register of Risk workflow tab and then assign them to the resources from one of the risk views.
- Default rate for resource type Work is defined in **Tools > Options Cost** tab.

Assigning resources to tasks

1. On the **Schedule** tab, in the **Schedule Views** group, click **Project View**.
2. Select the task to which you want to assign the resource.
3. Click in the **Resource** field associated with the task.
4. Select a resource from the drop-down list. If you type in a new resource name, it will be added to the list of resources in the resource view. When you add a new resource in this manner, it will be assigned at 100% effort for work resource.
5. Enter **Cost** for cost resources



-
- Multiple resources can be assigned to a particular task.
 - Tasks do not have to have resources assigned to them.
-

Assigning a calendar to a resource

1. By default, RiskyProject assigns the Standard calendar to resources.
2. On the **Resource** view, double-click on a resource ID.
3. Select a resource calendar from the **Base Calendar** drop-down list.
4. Click the **Working Time** button (**Schedule** tab) to modify the resource calendar.

Defining work

You can enter tasks as work rather than duration. The Work view shows the total work of all resources assigned to a task.

1. On the **Schedule** tab, in the **Schedule Views** group, click **Work**.
2. Select the **Task type: fixed units, fixed duration, or fixed work**. The same information can be defined using **Advanced** tab of Task Information dialog box
3. Check the **Effort driven** flag if the task is effort driven (default value). Effort driven task can be defined in the **Advanced** tab of Task Information dialog box.
4. Enter low, base, and high work for the selected task. Units for work are defined in the **Tools > Options > Duration** tab. Duration and units for the task will be calculated based on task type.



- For probabilistic calculations, work is always correlated with duration. Seed and distribution of the duration are used for work as well. Therefore, seed and distribution for work are not entered.
 - You may view work assigned to the particular resource in the Resources tab of Task Information dialog box.
-

Cost Rate Tables

Cost rate tables allow you to define rates and cost per use that change over time. For example, on January 1, 2011, cost was \$10/hr. On February 1, 2011, cost became \$12/hr. For rate you may enter a value or a percentage of increase or decrease from the previous rate. For instance, if a resource's cost per use is reduced by 20% type -20%.

To define cost tables:

1. On the **Schedule** tab, in the **Schedule Views** group, click **Resources**.
2. Double-click on Resource ID. Resource information dialog opens
3. Go to **Costs** tab
4. Enter effective date, rate and cost per use for this effective date

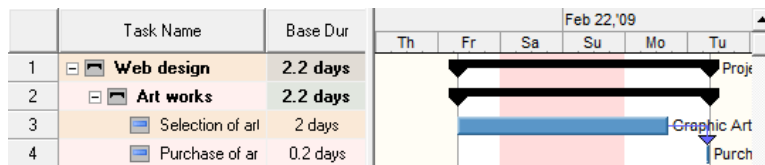
Managing Costs

Cost, Income, and Profit Calculations in RiskyProject

You can define cost and income associated for tasks with risks and uncertainties. You can use income to perform an analysis of the full life cycle of a project. Profit is calculated as the difference between income and cost. This will affect the way that RiskyProject presents data in the Cost and Cash Flow views. If the project has income, all cost and cash flow, data is now shown as Profit where costs are a negative value. In these cases, it is possible that a project will have negative profit.

The example below illustrates how fixed, and variable (resource) costs are calculated with respect to tasks and subtasks:

	Task Name	Cost Low	Cost	Cost Hi...	Accrual	Res.Cost	Tot.Cost	Income A...
1	Web design	\$0.00	\$0.00	\$0.00	Start	\$1004.8	\$1604.8	\$0.00
2	Art works	\$0.00	\$0.00	\$0.00	Start	\$864.00	\$1464.0	\$0.00
3	Selection of art	\$200.00	\$200.00	\$200.00	Start	\$800.00	\$1000.00	\$0.00
4	Purchase of ar	\$400.00	\$400.00	\$400.00	Start	\$64.00	\$464.00	\$0.00



The project schedule includes the summary task “Web Site Design”, the summary task “Art Works”, and subtasks “Selection of artwork” (2 days duration) and “Purchase of art work” (0.2 days duration). “Selection of artwork...” has base fixed cost \$200 and is assigned to the Graphic Artist with rate \$50.00/hour. “Purchase of artwork” has a base fixed cost of \$400 and is performed by Purchaser with a rate of \$40.00/hour. The work is supervised by project manager with rate \$80.00/hour, but only 10% his time is assigned to this project. It is assumed that a day has eight (8) working hours.

	Resource name	Chart	Type	Initials	Rate	Max.Units	Base Cale...
1	Graphic Artist	<input type="checkbox"/>	Work	G	50.00/hr	100.00%	Standard
2	Purchaser	<input type="checkbox"/>	Work	P	40.00/hr	100.00%	Standard
3	Project Manager	<input type="checkbox"/>	Work	P	80.00/hr	100.00%	Standard

The Fixed cost for the summary task is calculated as the sum cost of all subtasks, which do not have subtasks under them. Resource costs for summary tasks are calculated as cost of all resources assigned to summary task plus resource cost of all subtasks.

A. Calculation of base fixed cost for summary task “Web Site Design”:

Base fixed cost for “Selection of artwork...” (Task 3) = \$200.00

Base fixed cost for “Purchase of artwork” (Task 4) = \$400.00

Total = \$600.00

B. Calculation of variable (resource) cost for summary task “Web Site Design”:

Resource cost for project manager = 17.6 hours * \$80/hr / 10 = \$140.80

Resource cost for Selection of artwork (Task 3) 16 hours * \$50/hr = \$800.00

Resource cost for Purchase of artwork (Task 4) = 1.6 hours * 40/hr = \$64.00

Total = \$1004.80

Income is calculated similarly to cost calculation. Income cannot be assigned to the resources.

Variable and Fixed Costs and Income

There are two types of costs in RiskyProject:

- **Fixed costs**, which are associated with tasks; and,
- **Variable costs**, which are associated with resources.

Costs associated with resources are calculated based on rate, units assigned, and work of the particular resource.

Income is always fixed. You define it in the same manner as fixed costs. Both fixed cost and income can be accrued at the beginning of the task, at end of the task or be prorated.

You define and verify costs and income in the **Cost and Income** tab (Schedule tab if the workflow bar) and report results within **Profit Report** view (Report tab).

Cost Per Use

Per-use costs are one-time fees for the use of a resource, such as equipment. Per-use costs never depend on the amount of work done. Instead, they are one-time costs that are incurred every time that the resource is used. Although a per-use cost for a work resource depends on the number of assignment units used, a per-use cost for a material resource is applied only one time. For example, if a bricklayer has a per-use cost of \$100 (instead of an hourly rate) and it takes three brick layers to complete a task, the cost is \$300. However, a per-use delivery cost of \$100 for a material resource like cement is applied only once per delivery, whether 10 tons of cement are delivered or 100 tons.

Adding fixed costs and income to tasks

The Cost and Income view also shows the calculated results for fixed costs and resource costs.

1. On the **Schedule** tab, click the **Cost and Income** view.
1. Select the task in which you want to include fixed cost or income.
2. Enter base fixed cost in the **Cost** field. You can enter in Low and High estimated costs.
3. Select an accrual method in the **Accrual** column. Accrual methods indicate how cost or income is accrued in the task. Default accrual method if defaulted in **Tools > Options**, cost tab separately for cost and income. Accrual methods available are:
 - Start
 - Finish
 - Prorated

4. Enter Income in the same manner as above.



- You may assign fixed cost and income to the summary tasks the same way as they are assigned to the subtasks
 - You may define uncertainties in fixed cost and income using low, base and high values of cost and income, as well as seed and statistical distribution.
 - Uncertainty in variable cost is originated in task work since variable cost = resource work * number of units * rate.
-

Chapter 4: Quantitative Risk Analysis

Assigning Risks to Tasks and Resources

Risk Assignments

Risks must be assigned to calculate their impact. If a risk is not assigned to any tasks or resources it will remain in the risk register, but probability, impact, and score will not be shown.

RiskyProject has two types of risks assignments:

- **Global Risk Assignments** – Global risk assignments are those risk assignments that have a chance of affecting the project as a whole and are not limited to specific tasks or resources. For example, political or weather risks would be assigned as global.
- **Local Assignments** – Local risk assignments are those risks that have a chance of affecting only specific tasks or resources. A local risk assignment can affect more than one task or resource. For example, risks affecting the delivery of specific equipment for a certain phase of a project would be assigned local.

You can edit or view risk assignments in the following dialog boxes and views:

View	dialog box/Tab	Local or Global	Assigned to tasks or resources
Risk Assignment View		Risks can be re-assigned to different tasks or resources or become global	Both task and resources
Risk Register	Risk information dialog (double-click on Risk ID), Assignment tab	Both local and global risk	Both task and resources
Any view with task information (Project View, Result Gantt, etc.)	Task information dialog (double-click on Task ID), Risk tab	Local risks	Task
Resource View	Resource information dialog (double-click on Resource ID), Risk tab	Local risks	Resources

Converting your project from Qualitative to Quantitative Risk Analysis

If you have risks in the Risk Register, but no schedule, you can perform a qualitative risk analysis of your project. If you add even one task to the project, all your risks will convert to global risks, and will therefore be assigned to all tasks.

In quantitative risk analysis risk categories are separated into two groups:

- **Schedule related risk categories:** “Schedule and Scope” which is related to category “Duration” in qualitative analysis and “Cost and Income” which is related to category “Cost” in qualitative analysis.
- **Non-schedule categories** (Safety, Quality, Technology, etc.)

In qualitative risk analysis the “Duration” category has only one outcome type “Relative delay”; however, in quantitative analysis, the corresponding category “Schedule and Scope” has many outcome types (fixed delay, relative delay, etc.). Similarly, in qualitative analysis the “Cost” category has only one outcome type, “Relative cost increase”; whereas the “Cost and Income” category in quantitative analysis has many outcome types (fixed cost increase, relative cost increase, etc.).

If you add a schedule (i.e. activities or tasks) to your project, the following occurs:

- Risks with the outcome type “Relative Delay” will convert to a global risk with the same outcome type.
- Risks with the outcome type “Relative Cost Increase” will convert to a global risk with the same outcome type”.

At this point, you may need to reassign these risks to particular tasks or resources and modify the outcome types. For example, a risk which had a Relative Cost Increase may need to be modeled as a Fixed Cost Increase.

- The Probabilities and impacts of schedule related risks in quantitative analysis are calculated differently than in qualitative analysis.
- Schedule related risk impacts are calculated as a correlation between the duration or cost impact for each risk and project duration or cost.
- As a result, probabilities and impacts of schedule risk for quantitative and qualitative analysis will be different.

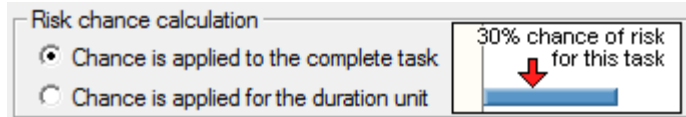
For more information about calculation of probabilities and impacts of risks for quantitative analysis read, “**How are risk probabilities, impacts, and scores calculated?**” in the Frequently Asked Questions.

- The risk register has an additional column for quantitative risk analysis: risk assignment. To view pre- and post-mitigation probabilities and impacts for quantitative risk analysis, you must calculate your project.
- When you have a project with a schedule, the Risk Assignment view is enabled. The Risk Assignment icon will be disabled in the workflow bar for qualitative analysis (no schedule).
- When you remove a schedule but do not remove risks, you will be performing qualitative risk analysis.

Risk Attributes for Quantitative Risk Analysis

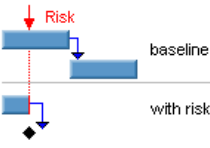
Each risk has the following information related to quantitative analysis.

- Risks can be assigned to Tasks or Resources
- Risks are defined by the **chance of occurrence** (from 0% to 100%). The chance can be defined per task (by default) or per duration unit. For example, if there is a 30% chance that task can be restarted per day. If task duration is 2 days, the chance of the risk occurring per task is 60%. This chance calculation option is defined for **all tasks and resources** for the project in the **Risk** tab of the **Options** dialog box:



- Each risk has a different **outcome type**. Outcome types can be schedule and cost related and non-schedule related, which you can customize using the Risk Outcome dialog box. Standard schedule-related risk outcomes are shown in the table.

Outcome Type	Description	
No Impact	This is for information only and has no impact on project schedule	
Relative Delay Fixed Delay	Durations will be expanded in the period, defined in the Result field regardless of, when the risk occurs. If the Result is negative, the task duration will be reduced. If task duration is elapsed, the delay will also be represented in elapsed units (edays, ehour, etc.)	
Relative Cost Increase Fixed Cost Increase	Task related fixed costs are increased by the amount, defined in the field Result regardless of when the risk occurs. If the Result is negative, costs are reduced. These risks do not affect cost per use.	
Relative Income Increase Fixed Income Increase	Works in a similar manner to fixed cost increase and relative cost increase but applied to the income.	
Restart Task	Tasks are restarted from the moment the risk occurs. As a result, the task duration is increased.	
End Task	Tasks are successfully completed when the risk occurs. As a result, the task duration is reduced.	
Cancel Task	Tasks are canceled when the risk occurs. As a result, the task duration is reduced, and the task is marked as canceled.	

Cancel Task + all successors	Tasks and all its successors are canceled when the risk occurs. As a result, the task duration is reduced, and the task and all its successors are marked as canceled.	
Rate Increase	This risk can only be used on resources. If this risk occurs, the rate will be increase or reduce. For example, if the rate is \$20/hour and risk outcome is 50%, the rate will be \$30/hour if the risk occurs. This outcome affects project cost.	
Execute Response Plan	Result field for this risk contains a dropdown list with mitigation plans. They come from Risk Mitigation or Response view. If task has multiple local and global risks, which require execution of the particular mitigation or response plan, this plan will be executed only once.	

- The **Outcome** is related to the outcomes “**Fixed cost increase**”, “**Relative cost increase**”, “**Fixed delay**”, “**Relative delay**”, and “**Rate Increase**”. It defines how much the duration or cost will be increased or reduced.
- RiskyProject calculates the **Risk Impact** for duration and cost using sensitivity analysis and displays this in the Risk Register, Risk Assignment views and Risk Tabs for Tasks and Resources. Colors are used to indicate the level of correlation between the risk and project duration and cost.
- Red indicates a strong correlation
- Yellow a medium correlation
- Green a weak or no correlation

Colors for threats are the opposite. Particular colors for the risk impact value depend on the risk tolerance defined in Format Risk Matrix dialog box.

Assigning local and global risks

Once you have added your risks you can start assigning your local risks to tasks and resources. You cannot assign the same local risk to both a task and a resource. RiskyProject offers a number of ways to assign risks to task and resources.

Method 1: Assigning global and local risks using Risk Register

This method is useful when you edit risk assignment, for example for mitigation planning. You will be able to view all risk assignments in one place. With the risk register, you can assign both local and global risks.

1. Open the **Risk Register**.
2. Double- click on the risk to which you want to add properties.
3. Click the **Assign to tasks or resources** tab.
4. Depending upon whether you are assigning local or global risk to a task or resource click on the first empty row in either the Tasks or Resources tables.
5. Select the task or resource from the drop-down list. You may select “All Tasks” or “All Resources” for global risk assignments. If you select a specific task or resource, it will have a local risk assignment.

6. Click the row ID cell the item you just select to enable the **Selected assignment** table to the right. This is where you define the risk assignment.
7. Click in the **Chance** cell to start entering the **Chance**, **Outcome**, and **Result** of the risk.
8. Select the **Moment of risk** distribution from the drop-down list. If it is triangular, you must define the **Start**, **Most Likely**, and **Finish** parameters.
9. Click in an additional row to enter a mutually exclusive risk alternative. A risk alternative is a different outcome from the same event.

This shows how you assign risks to tasks in the Risk Register:

The screenshot shows two windows. The left window, titled 'Select task you want to assign risk to:', contains a table with columns 'ID' and 'Task Name'. It lists three tasks: Task 1, Task 2, and Task 3, plus a 'Global Risk - All Tasks' option. A callout box labeled '1' points to the 'Task 2' row, stating 'Click on the cell. Drop down list will come up. Select the task from the list'. The right window, titled 'Enter probability and outcome for task: Task 2', contains a table with columns 'A.', 'Chance', 'Outcome Type', and 'Outcome'. It lists three risk alternatives for Task 2. A callout box labeled '2' points to the first row, stating 'Enter chances and outcomes for the selected task'. Other callouts explain that steps 1 and 2 are repeated for all tasks (3) and resources (4), and that risks can be assigned to specific tasks or globally. A note also states that risks assigned to different tasks can have different chances and outcomes, with an arrow pointing to the 'Chance' column in the right window.

ID	Task Name
1	Task 1
2	Task 2
3	Task 3
	Global Risk - All Tasks

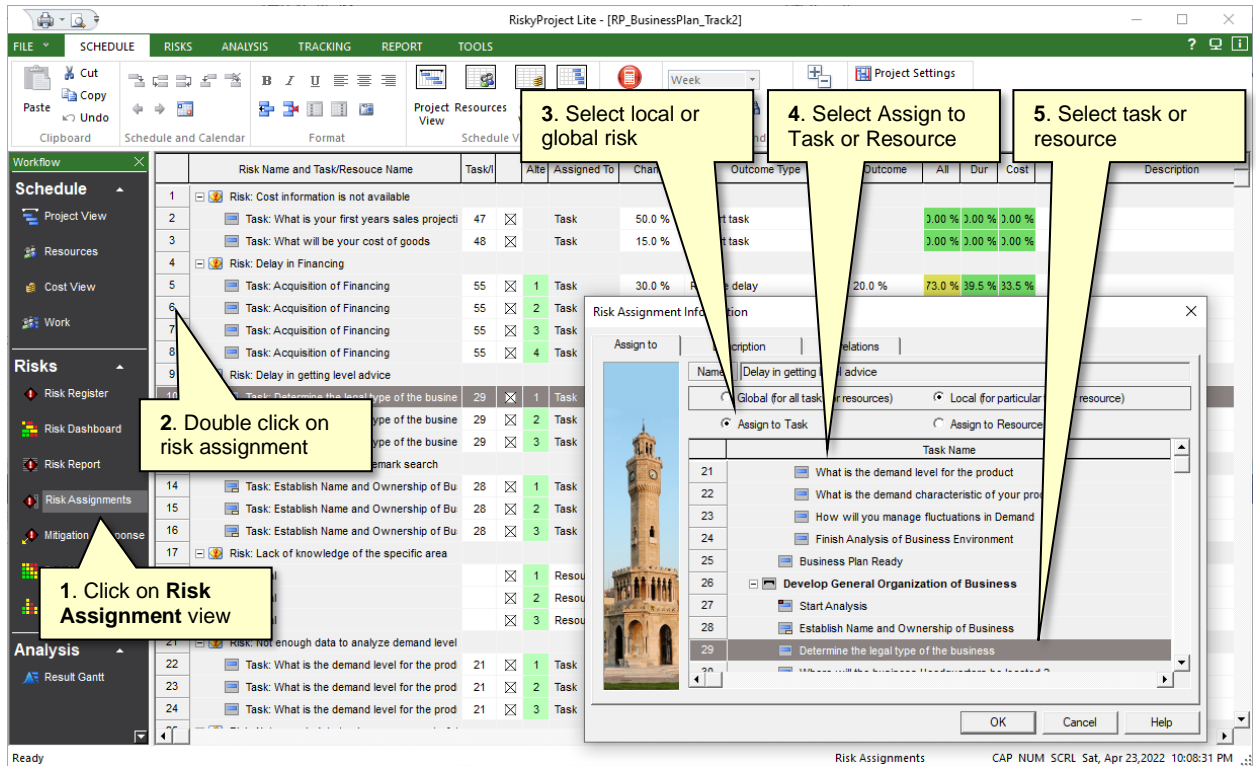
A.	Chance	Outcome Type	Outcome
1	15.0 %	Relative delay	20.0 %
2	20.0 %	Relative delay	30.0 %
3	30.0 %	Relative delay	40.0 %
5	30.0 %	Safety Risk	Minor: requires medical attention



- Use the Pie Chart for mutually exclusive risk alternatives to as a guide for how they affect the overall chance that the risk will occur.
- If you do not enter chance, outcome, results, or moment of risk assignment will not be saved even you selected task or resources.

Method 2: Re-Assigning risks using the Risk Assignment view

This is the recommended method to re-assign risks to different task and resources or make them global.



To reassign risks:

1. On the Risks tab, click the **Risk Assignment** view.
2. Double-click on a risk assignment; the **Risk Assignment Information** dialog opens
3. Select either global risk (for all tasks or resources) or local risk (for particular tasks or resources)
4. For Local risks, select Task or Resource
5. For Local risks, select tasks or resources from the list box.



- If a risk has multiple alternatives, you may need to re-assign all alternatives
- You can disable Global risks for specific tasks. To disable a global risk for a specific tasks, open the Task Information dialog box, Risks tab and clear **Apply global risks to this task** checkbox.

Method 3: Assigning Local Risks Using the Task Information dialog box and Resource Information dialog box

You can define task risks in the **Risk** Tab of **Task Information** dialog box. All risks entered here are “local risks”. It is a preferred method if you want to assign few different risks to few separate tasks and resources.

1. Open the **Task Information** or the **Resources Information** dialog box.

2. Click the **Risks** tab.
3. Double-click on **Risk Name** field and type in the name of the risk.
4. In addition to the above steps, you can:
 - Click the **Enlarge** button to expand the view and make it easier to assign risks.
 - Click the **Load Risks from Template** button to load all risks from a risk template. In this way, you can create a master list of risks in the template, load it here and enable or disable risks as required.
 - Clear the **Apply global risks to this task** check box (it is selected by default) if you do not want to include this task in global risk calculations.
 - Check **Enable statistical distribution for risk outcome** to be able to enter low and high risk outcome for this and other tasks. For more information about probabilistic risk outcome types, read “*Uncertainties in Risk Outcomes*”. You can also Enable/Disable statistical distribution for risk outcome in **Schedule > Project Options > Risk** tab.



- You cannot add risks to summary tasks.
- Ensure that you have clearly defined your risks and uncertainties. For example, if you have already accounted for risk using a range (Base, High, and Low) of durations; do not add this as a risk as it is accounted for twice in the calculations.

Task Information

General | Predecessors | Resources | Advanced | Deadline | Risks | Tracking

Name: Who are your Competitors ? 14 risks

	Risk name	Alert	Chance	Outcome Type	Outcome	All	Dur	Cost
1	Not enough information about com	<input checked="" type="checkbox"/>	1 25.0 %	Relative delay	20.0 %	39.7 %	29.1 %	10.6
2	Not enough information about com	<input checked="" type="checkbox"/>	2 20.0 %	Relative delay	40.0 %	39.7 %	29.1 %	10.6
3	Not enough information about com	<input checked="" type="checkbox"/>	3 15.0 %	Relative delay	60.0 %	39.7 %	29.1 %	10.6
4	Not enough information about com	<input checked="" type="checkbox"/>	4 10.0 %	Restart task		39.7 %	29.1 %	10.6

Uncheck this box if you don't want to apply global risks to this task

Apply global risks to this task (see Risk Assignment View)

OK Cancel Help



You can copy and paste risks between tasks. Right-click and choose *Copy Risks* to copy a risk. In the target task's risk list, right-click and choose *Paste Risk* to add the risk to the task.

Risk Assignments on the Gantt Chart

Risks and issues can be shown on the Gantt chart as arrows:




Colors represent the calculated the impact of the risk on all project parameters combined. The size of the arrow represents probability. You may click on each risk arrow within a Gantt chart to be shown with information about risks.



- Only local risks are shown as arrows.
- You cannot add or remove mutually exclusive alternatives using this dialog, but you can input chance of occurrence, outcomes, result, and moment of risk.

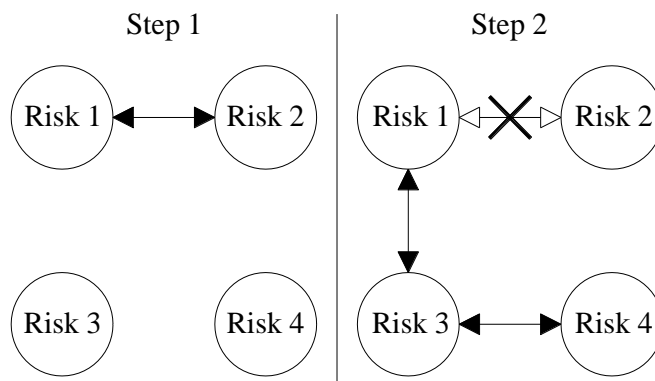
Showing or hiding risks on the Gantt chart

Click the  button on the Analysis tab toolbar to toggle the risk arrows on or off. You may also Right-click on Result Gantt chart and select Show Risks.

Risk Correlations

Different risks can be correlated to each other. For example, bad weather conditions (risk 1) can mean that the delivery of the goods can be delayed (risk 2). For each risk, you can specify correlated risks or view risks, which can occur with a particular risk. For example, the risk **Technical Difficulties with HTML editor** occurs together with the risk **Major problem with web site**.

If you define a correlation between risk 1 and risk 2, and then define a correlation between risk 1, risk 3 and risk 4, the correlation between risk 1 and risk 2 defined in the previous step will be removed. Therefore, if you want to setup correlations between many different risks, you must perform this in one-step.



- Risk correlations can be specified once for different mutually exclusive alternatives of the same risk. The Moment of risk will not be correlated: even though risks are correlated, they may occur at a different moments during the task duration.

How correlated risks are calculated

RiskyProject uses the same seed for correlated risks. If seeds for two risks are the same, then sampling will follow the same pattern and risks will be correlated with each other.

If risks are correlated with each other, it does not mean that they will always occur together as the risks may have different chances of occurrence. If Risk 1 has a chance of occurrence of 10% and Risk 2 has a chance of occurrence of 20% and both risks are correlated, Risk 1 will always occur when Risk 2 occurs, but Risk 2 may occur when Risk 1 does not occur.

Correlating risks

Risk correlations can only be defined in the risk tabs on Task Information and Risk Information dialog boxes.

1. Right-click on the risk.
2. Click the **Correlations** tab.
3. Select a risk from the list of all available risks.

4. Select the task or resource to which this risk is assigned. This is required when risks with the same name are assigned to different resources or tasks.
5. Click **OK** to save this information.

Correlation of risk assignments

The risk events may occur at the same time (risk assignments are correlated) or in different times (risk assignments are not correlated). The default rule, or how different risk assignments are correlated, is defined in project options. To change this rule:

1. Click the **Schedule** tab. In the **Settings and Options**, click **Options**. The Options dialog box opens.
2. Click the **Risk** tab.
3. If check box **Risk assignments to different tasks are correlated** is checked, all local and global assignments of the same risk will be correlated by default.

Managing Uncertainties

If you have accurate historical statistical data that is analogous to a particular element in your project, we recommend that you use this data to model uncertainty in your project as opposed to risk events. Be aware of double-counting risk and uncertainty as most of the uncertainty in a project is due to the probability of risk events occurring.

To define uncertainties:

1. Define a 3-point estimate for any of task parameters: fixed cost, income, duration, and start time. 3-point estimates for work will be calculated automatically based on uncertainty in duration. You may also define 3-point estimates for the lag.
2. You can define a **Most Likely** duration or fixed cost. By default, Most Likely duration or fixed cost equals Base duration and Fixed Cost. However, you can define separate Most Likely values. This can be used if you believe that the Base values from original project schedule is not realistic, but you want to maintain the original Base values. Most Likely values are used only with Triangular and BetaPert distributions.
3. After you define 3-point estimates, a statistical distribution will be assigned. You may change the default statistical distribution for the duration, cost, income, and start time parameters in the **gf Distributions** tab of **Task Information** dialog box.



The meaning of low, base, and high data depends on the statistical distribution defined in the Distributions tab of the Task Information dialog box.

Adding 3-point estimates for task duration and start times using Task Information Dialog

1. On the **Project** view, double-click on the task ID.
2. Click the **General** tab.
3. Define a **Base**, **Low**, and **High** dates for **Duration** and/or **Start Time**.
4. Define a **Base**, **Low**, and **High** values for **Duration**. By default, when you enter a value for duration, the default values for Low and High are calculated based on the defaults set in the Duration Options.
5. Click **OK** to save the estimates.

Adding 3-point estimates for task duration using the Project View

1. On the **Project** view, select the task to which you want to add cost and income estimates
2. Enter cost data for **Duration Low**, **Duration Base**, and **Duration High**. By default, when you enter a value for Duration Base, the default values for Low and High are calculated based on the Duration defaults set in the Duration Tab of Project Options dialog.
3. You may define a **Most Likely Duration**. The Duration Most Likely column is hidden by default, so you will need to insert the to your datasheet. To insert column right click on column header, choose “Insert Column Before...” or “Insert Column After...”, and select **Duration Most likely**.

Adding 3-point estimates for task cost and income

1. On the **Cost and Income** view, select the task to which you want to add cost and income estimates
2. Enter cost data for **Cost Low**, **Cost**, and **Cost High**. By default, when you enter a value for Cost, the default values for Low and High are calculated based on the Cost defaults set in the Cost Tab of Project Options dialog.
3. You may define a **Most Likely Duration**. The Duration Most Likely column is hidden by default, so you will need to insert the to your datasheet. To insert column right click on column header, choose “Insert Column Before...” or “Insert Column After...”, and select **Duration Most likely**.
4. Enter income data for **Inc. Low**, **Income**, and **Inc. High**.

Adding 3-point estimates for lags

1. On the **Project** view, double-click on the task ID.
2. Click the **Predecessor** tab.
3. Enter Low, Base, and High Lag. Default statistical distribution will be generated automatically. There are only two distributions for lag: Uniform Triangular.
4. Click **OK** to save the estimates.

Assigning Low, Most Likely, and High Estimates for Duration and Cost for Group of Tasks

You may assign statistical distribution for duration and cost for a selected group of tasks:

1. Open the **Project** View. Select a group of tasks.
2. Right-click on a Task ID.
3. Select **Set Low/ /High Duration** or **Low/ High Fixed Cost**.
4. Enter fixed values or use coefficients to calculate **Low, Most Likely, and High duration** or cost based on **Base duration or Cost**.
5. Select a distribution from the drop-down list.
6. Click **OK** to apply changes.





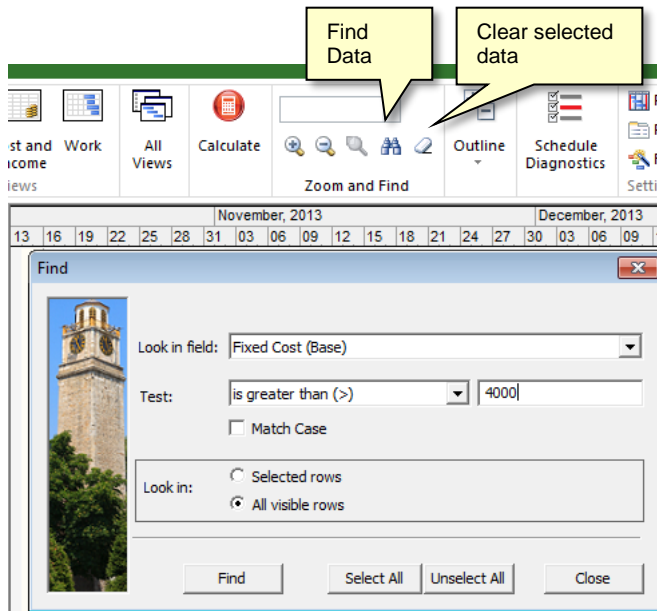
You may clear the statistical distribution for a particular group of tasks. To do so, go to the same dialog and select “Set low, most likely and high duration equal base duration” for duration or “Set low, most likely and high cost equal base cost” for cost.

Finding Text or Data


A popular method to quickly assign low and high estimate for duration and cost using coefficients is to assign them to groups that are identified by specific values in text or data fields. This is often referred to as grouping or banding.

To find specific text or data values in your project fields.

1. Click the **Schedule** tab. On the **Zoom and Find** group, click the Find  button. The Find dialog box opens.
2. From the **Look in field:** dropdown list, select the column that you want to search. This list contains only those columns available in currently open view.
3. From the **Test:** dropdown list select the logic definition that you want to use for your search. Type in the value that you want search for in the text box to the right. Selected activities are highlighted. Activities will remain selected until you clear the selections.
4. To clear your selections, click the **Unselect**  button.
For example, if you want to find/select all Tasks with that include “Design” in the task name, select Task Name in the Look in field: dropdown list. From the Test: dropdown list, select contains and type in “Design” in the text box and click Find.



To select all activities:

1. Click the **Schedule** tab. On the **Zoom and Find** group, click the Find  button. The **Find** dialog box opens.
2. Click **Select All**. All activities are selected.

Assigning Low and High Estimates for Duration and Cost to Found Tasks

Once you have selected the activities that you want to modify, you can then mass edit the low and high estimates for duration and cost to the selected activities.

To set low and high duration or cost to found activities:

1. Using the **Find** feature, search for those activities to which you want to set the low and high duration or cost.

2. In an open view, click on the Task ID of one of the found activities (highlighted in black) to select it. The highlighting will change to a lighter shade of gray to indicate that you have made a selection.
3. Right-click and from the shortcut menu, choose either Set Low/High Duration or Set Low/High Fixed Cost.
4. In the dialog box, click the **Apply to Found tasks** option.
5. Enter the rest of the required values or coefficients for Low and High estimates and select a statistical distribution.
6. Click **OK**.

Chapter 5: Analyzing Project Results

Calculations

RiskyProject has two types of calculations:

- **Deterministic calculation of current schedule** - The default calculation is automatically performed when you modify a project schedule. As this calculation occurs automatically, you do not need to press the Calculation button. This calculation uses the Base input parameters (duration, start time, lag) without calculating the effect of risk or uncertainty.
- **Probabilistic (Monte Carlo simulations)** - Use this to calculate the project schedule and costs with uncertainties and risks.
- Automatic Monte Carlo simulations for small tasks are enabled by default.

Enabling or disabling automatic Monte Carlo simulations for small projects

1. Click the **Schedule** tab. In the **Settings and Options**, click **Options**. The Options dialog box opens.
2. Click the **Calculations** tab.
3. From the **Default Calculation for Small Projects** option box, select one of the two options:
 - Current Schedule Calculation only
 - Probabilistic Calculation (Monte Carlo simulation)
4. Click **OK**. RiskyProject automatically determines which project is small based on your computer's performance and the size of the project.

Running probabilistic calculations

Click the **Calculate** button. You may cancel the probabilistic calculation at any time; however, if the number of simulations performed is less than 20, no probabilistic results will be calculated.



- By default RiskyProject performs convergence monitoring. Simulations can be stopped when they convergence equals mean and standard deviation values defined in Schedule tab > Options > Calculation.
- Minimum number of simulations is 200.
- If you cancel a calculation after more than 20 simulations and generate results, use these results with caution as the number of simulations which have been run may be too small to provide an accurate portrayal of the project's risks and uncertainties.
- If you try to perform Monte Carlo simulations without risks and uncertainties, simulations will not proceed in the same manner as when you define risk and uncertainties. Remember that uncertainties include a probabilistic calendar.

Defining the number of simulations

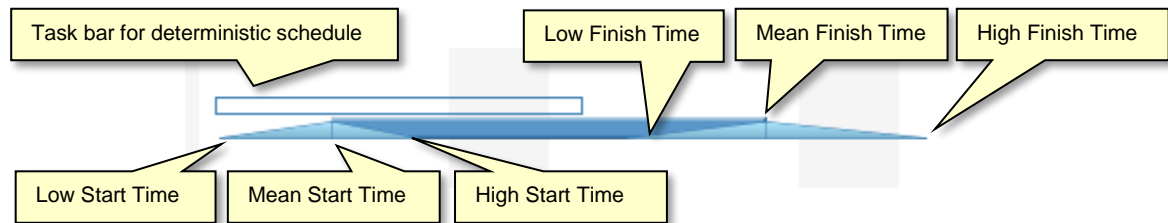
You can define the total number of simulations run during each probabilistic calculation.

1. Click the **Schedule** tab. In the **Settings and Options** group, click **Options**.
2. Click the **Calculations** tab.
3. Type in the number of simulations in the **Maximum number of simulations** box. The number of simulations that have actually been run could be less if the simulations converge.

Analyzing Results

Results Gantt Chart

RiskyProject displays the start and finish ranges of each task in the Result Gantt view. The calculated project and baseline schedules are shown in the same Gantt chart. You can use the task bar for current schedule to compare deterministic and probabilistic schedules.



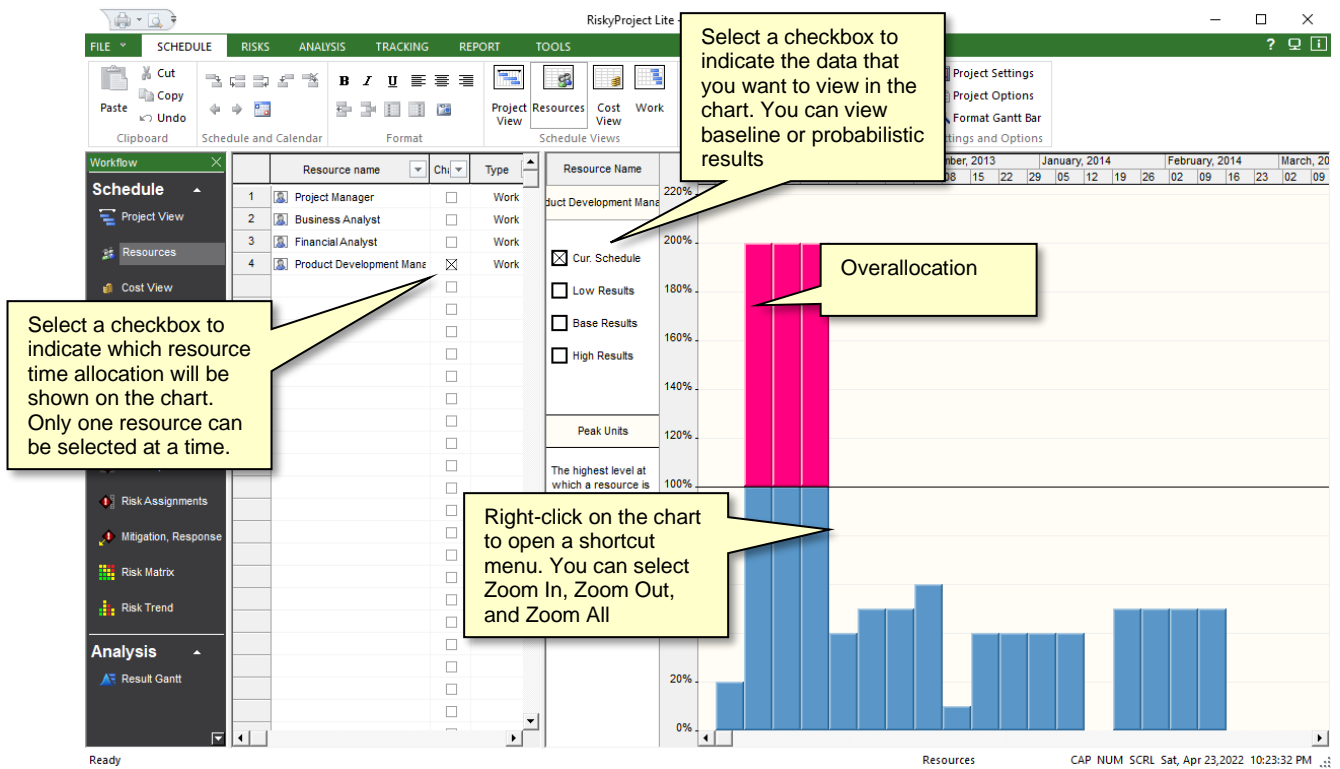
You can display Result Gantt associated only with low (optimistic) and high (pessimistic) results.

Showing or Hiding Low/High Results

1. Right-click on the chart and a shortcut menu opens.
2. From the shortcut menu, choose one of the following viewing options:
 - Show Low/High Results
 - Show Low Results
 - Show High Results
 - Show Current Schedule.

Resource Allocation

The Resource chart shows the time allocation for a selected resource.



For the resource chart to open, two conditions must be met:

- You must select the **Chart** check box for a resource in the resource sheet.
- The selected resource must be assigned to a task.

You can select four different types of resource charts:

- **Peak units:** The highest level at which a resource is scheduled for all assigned tasks during a given period.
- **Work:** The total number of hours a resource is scheduled for all assigned tasks during a given period.
- **Overallocation:** A resource is over allocated when it has more work assigned than can be done in the resource's available time. Overallocation is number of hours a resource is scheduled for all assigned tasks over resource's available time. Overallocation can be shown only for work (not material and cost) resources.
- **Percent allocation:** The percentage of a resource's capacity taken up by all of its assigned tasks during a given period. Percent allocation is only available for work (not material and cost) resources.

Selecting the resource chart type

1. Select the **Chart** check box associated with the resource.
2. Right-click on the **Resource** chart and choose one of chart types from the shortcut menu.



Overallocation for work resources is calculated based on Maximum Units, defined for the resource in the Resource view. For example, if maximum units are 150%, overallocation can be work above 150%.

Chapter 6: Project Control

Tracking Performance

Tracking is an important step in the project risk management workflow. You add tracking information in the **Tracking** tab of the **Task Information** dialog box. Tracking information is shown on the **Tracking Gantt** and **Result Gantt** views.

Tracking information is not included in the current schedule (deterministic) calculation. The progress of summary tasks is a function of its subtasks; therefore, you cannot add tracking data to summary tasks. RiskyProject will calculate tracking data for summary task and complete project automatically.

Calculating and reassessing tasks using tracking data

RiskyProject uses tracking information for probabilistic calculations. The purpose of the calculation is to reassess the task duration, start, and finish dates based on the actual progress. As the deterministic current project schedule remains unchanged, you can compare your original estimates with the forecasted schedule.

If a task has tracking information, new forecasted task duration and finish times are calculated. The results of this calculation are instantly plotted on the tracking chart as a green rectangle. The task's start time is actual start time entered in the tracking data.

The actual start time, forecasted task duration, and finish time are used for probabilistic calculations. If the percentage complete is greater than 0%, uncertainties in remaining duration are calculated using one of two methods:

1. If you enter percent completed, but did not enter remaining duration, original low and high duration will be used to calculate remaining duration. RiskyProject project will calculate deterministic projected duration based on percent completed and status date. Then on each iteration, RiskyProject will calculate duration based on original statistical distribution. Duration for task in progress on each iteration will be extrapolated based on projected deterministic duration.

Example

Originally, a task had duration of **10 days (low duration 8 days, high duration 12 days: +- 20%)**. After two days, only **10%** task is completed. Deterministic projected duration will be 20 days. As a result of the analysis, the updated duration will now be between 16 and 24 days (+- 20% of projected duration).

2. If you enter the statistical distribution for the remaining duration and percent completed, remaining duration will be taken from the statistical distribution and added to the duration of the completed portion of the task. Original statistical distribution for duration will be ignored.

Example

Originally, a task had duration of 10 days (low duration 8 days, high duration 12 days: +- 20%). After two days, only 10% task is completed. Duration of the completed portion of the task is 2 days. Remaining duration is defined using triangular statistical distribution (min 1 days, most likely 2 days, and max 3 days). As a result of the analysis, the updated duration will now be between 3 and 5 days.

If the task has risks assigned to it (global or local), the chance of the risk is recalculated based on the current time, when the risk occurred, and the task completion percentage.

- If the percentage completed equals zero, all risks are used with their original chances of occurrence.
- If the percent completed equals 100, the chance of occurrence for all risks is internally set to zero. Although the original chance of risk occurrence is not changed, it is important to note that the actual outcome of risks changes.

Tracking Results

The probabilistic calculations always encapsulate the tracking information if it has been entered for a task. RiskyProject presents results of the tracking calculations in several different ways depending upon the view you are using to examine it.

View	How Tracking information is presented
Project View	No tracking information on the baseline schedule
Results Gantt	Tracking data is represented as green, yellow, and red bars. These bars represent percent completed. It can be turned on and off when you right-click on Gantt chart and select "Show Tracking Bars".
Success Rate	Gantt chart is drawn based on current (deterministic) schedule
Crucial Task s	Gantt chart is drawn based on current (deterministic) schedule
Tracking Gantt	The Tracking Gantt behaves in the same manner as the Results Gantt, in addition, the percentage completed will be shown on the right of the bar

Entering tracking data

1. Select the task to which you want to enter the tracking data.
2. Open the **Task Information** dialog box.
3. Click the **Tracking** tab. By default, the first row should contain the actual start time with zero percent done.
4. Click the row below the previous entry.
5. Enter the status date or select it from the calendar.
6. Enter the percentage of the task completed by the specified date. All dates and percentages must be consistent. For example, you cannot have a record with 60% completed before a record with 40% completed. In addition, you cannot have historical data with the date Jan 5, 2004, before the record with Dec 14, 2003.
7. Optionally enter remaining duration parameters: low, base, and high duration, and statistical distribution for remaining duration. If you do not enter this information remaining, duration on each iteration will be calculated using extrapolation of original duration.
8. Define parameters of statistical distribution for remaining duration (see "Defining statistical distribution for remaining duration" for more information).
9. You can define Actual Work for each resource assigned to a task. It can be used to calculate tracking information. To enter Actual Work use **Resources** tab of Task **Information** dialog box.
10. Type in a comment to record actual details of work completed. You can now view the Tracking chart.

Method B. Remaining Duration is defined. Calculate task duration based on uncertainties remaining duration

Remaining duration from 2 to 5 days

Actual duration is 2 days

	Status	Date	% Done	Low Dur	Base Dur	High Dur	Note
1		01/04/17 08:00	0.0 %				Actual start time
2		01/11/17 00:00	10.0 %	2 days	10 days	15 days	

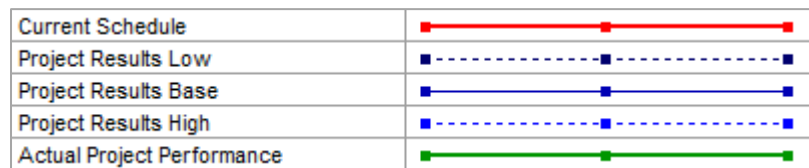
First row: actual start date of the task
 Remaining duration is optional. It affects probabilistic analysis only (if remaining dur. low < remaining dur. high). Calculate schedule to refresh the chart.
 Current Schedule Start Time: 01/04/17 08:00; Duration: 15 days



- To view any tracking information, including the percentage completed for summary tasks and the project, you must calculate the project.
- Remaining duration information is used only for probabilistic analysis.

Viewing Tracking Data

Once you have entered in the tracking information, the tracking chart is automatically updated to show the Current Schedule, Low, Base, High, Actual and Forecast tracking data.



- **Current Schedule** is always visible and represents the start and finish times of the task as entered in the task sheet.
- **Results Low, Base, and High** are calculated as part of the probabilistic calculations. **Low** is associated with minimum, P1, P5, or P10 results depending on setting defined in **Options (Calculation tab)**. **Base** is associated with the mean. **High** is associated with the maximum, P90, P95, or P99. If the low, base, and high results are the same, only one base line is drawn.
- **Actual** represents the actual progress of the task.
- **Forecast** is generated if you do not have the results of probabilistic calculations and you have entered a percentage for task completion but did not recalculate the project.



- To enlarge the chart, right-click and choose Details.

- To copy the chart to the clipboard or as a *JPEG, TIFF, GIF, PNG, or BMP* file, right-click and choose a copy command from the shortcut menu.

Viewing tracking data for a task

1. Select the task to which you want to enter tracking data.
2. Open the **Task Information** dialog box.
3. Click the **Tracking** tab. By default, the first row should contain the actual start time with zero percent done.
4. Right-click on the chart and select **Details**:
5. To copy the chart for use in presentations or reports, right-click and select one of the **Copy** commands.

Viewing the Tracking Chart

The Tracking chart view is the only way to see tracking results for the complete project

1. Click the **Tracking** tab. In the **Tracking Views** group, click **Tracking Chart**.
2. Select a checkbox beside the task name to see results for the specific task. If no check boxes are selected, the results for the entire project are shown.

Chapter 7: Reporting Project Results

Statistics Report for Quantitative Analysis

Once you have completed the Monte Carlo simulation, you can quickly generate a statistics report for selected tasks in your project schedule. The statistics report can include histograms for Start Time, Finish Time, Duration, and Cost as well as a Sensitivity to Finish Timetable with a Tornado chart. Statistics reports can be exported to PowerPoint.

To create a statistics report:

1. Run a simulation on your project.
2. Click the **Reports** tab. In the **Report Views** group, click **Statistics Report**.
3. Select the activities that you want to report on by clicking the check boxes beside the activity names.

The screenshot shows the RiskyProject Lite interface. The 'REPORT' tab is active, and 'Statistics Report' is selected in the 'Report Views' group. A callout points to the 'Export report to PowerPoint' button. The 'Task Name' list on the left has several checkboxes, with a callout indicating to 'Click the checkbox to select the activity'. The 'Customize the report' dialog is also visible. The preview window shows a report for 'Task 10: What is the potential market share?' with two histograms: 'Cost' and 'Duration'. The 'Cost' histogram shows a distribution from -1000.00 to 3000.00, and the 'Duration' histogram shows a distribution from 0.00 to 16.00 days. Both histograms include a 'For Non-Commercial Purposes Only' label.

Stat	Value	Stat	Value
Num. of samples	360	5th Percentile	\$1,486.00
Deterministic	\$1,920.00	10th Percentile	\$1,495.60
Minimum	\$941.20	15th Percentile	\$1,510.00
Mean	\$1,595.53	20th Percentile	\$1,517.20
Maximum	\$2,970.80	25th Percentile	\$1,524.40
Range	\$2,029.60	30th Percentile	\$1,532.80
P1/P99 range	\$1,783.20	35th Percentile	\$1,540.80
P5/P95 range	\$396.40	40th Percentile	\$1,547.60
P10/P90 range	\$171.20	45th Percentile	\$1,556.00
P20/P80 range	\$101.60	50th Percentile	\$1,561.20
P30/P70 range	\$60.80	55th Percentile	\$1,568.80
Variance	\$47,620	60th Percentile	\$1,577.60
Std.Deviation	\$218.22	65th Percentile	\$1,584.40
Semi Std.Dev.	\$114.76	70th Percentile	\$1,593.60
Skewness	3.514157	75th Percentile	\$1,603.60
Kurtosis	18.529849	80th Percentile	\$1,618.80
		85th Percentile	\$1,633.20
		90th Percentile	\$1,666.80
		95th Percentile	\$1,882.40

To export a statistics report to PowerPoint

1. Click the **Report** tab. Click **Statistics to PowerPoint**. Alternatively, you may click on **Click File** and then click **Export -> Microsoft PowerPoint**.
2. If Microsoft PowerPoint is installed on your computer, PowerPoint will be launched, and the report will be generated using settings defined in **Customize Report** dialog. Only frequency and cumulative probability charts and tornado (sensitivity) plots are exported to PowerPoint.



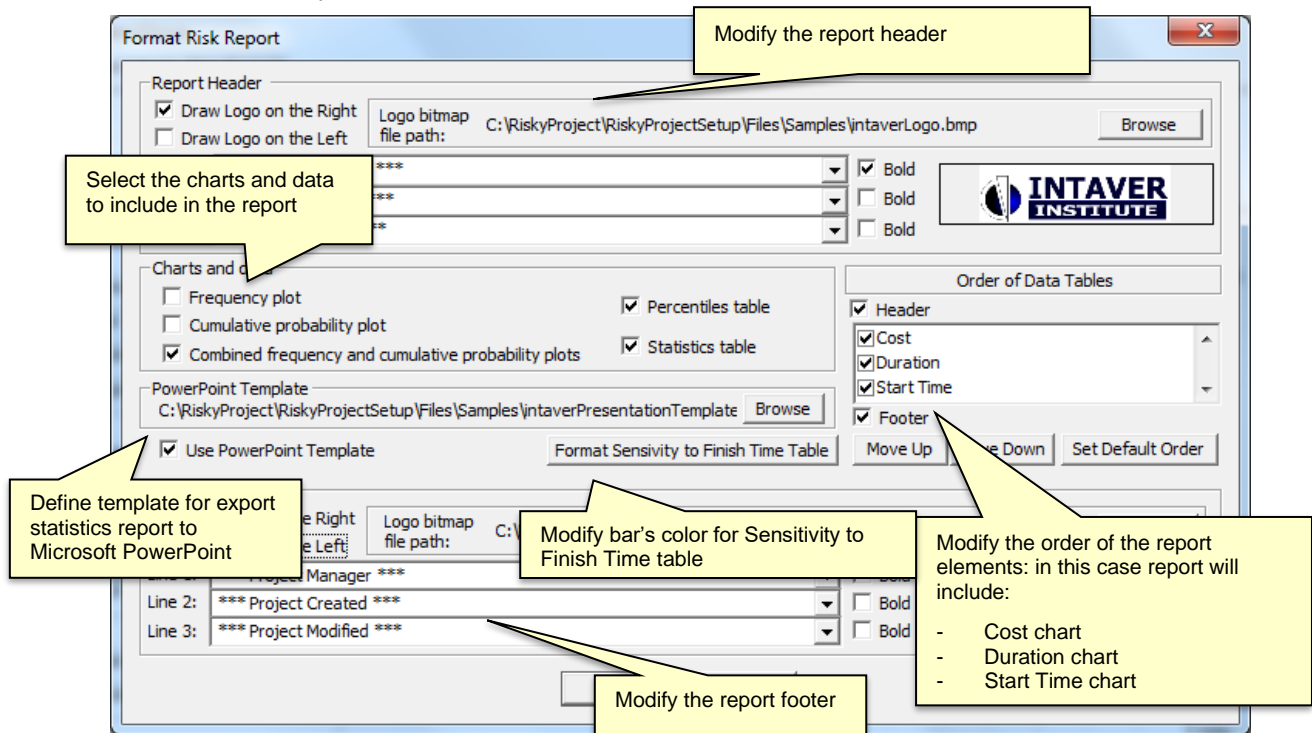
You may use your custom PowerPoint template. The template file can be defined in **Customize Report** dialog

Customizing the Statistics Report

You can modify the statistics report by adding or removing histograms, statistics, or the sensitivity chart as well as the general project information that is included.

To customize the statistics report:

1. Click the **Reports** tab. In the **Report Views** group, click **Statistics** Report.
2. Click the **Customize Report** button. The Format Risk Report dialog box opens.
3. In the **Charts and Data** group, add or remove the charts and tables that you want to include in the report.
4. Modify the order in which the report elements are shown in the **Order of Data** tables
5. Define bar's color for **Sensitivity to Finish Time** table
6. Define **PowerPoint template** for export statistics report to Microsoft PowerPoint
7. Add or modify **Header** and **Footer** information.



Setting up reports

You can set up how you want to print from all views with the exception of the **Resources**.

3. Click **File** and then click **Page Setup**. The **Page Setup** dialog box opens.
4. Enter the page margins in the **Margins** group box.
5. If you want to include a footer, select the **Draw Footer** check box.
6. Select the checkboxes associated with the information you want to include in the header.
7. If you want to include a header, select the **Draw Header** checkbox.
8. Select the checkboxes associated with the information you want to include in the footer.
9. If you only want to include headers or footers on the first page, select the **Draw on first page only** check boxes.
10. Click either the **Landscape** or the **Portrait** page orientation option. If you want a page border, select the **Draw page border** checkbox.
11. Adjust the height of each item (row) in the **Height of one item** box.

Modify the number of columns to print from a view

1. Select the view from the **columns for view** drop-down list.
2. Select the number of columns to print from the **Print** box. RiskyProject will print the number of columns in the same order they appear left to right in the selected view.
3. Click **OK**.

Printing reports

- Click **File** and then **Print**.

Previewing reports

- Click **File** and then **Print Preview**.

Copying data to the Clipboard

You can copy project data to the clipboard, for use in other applications; see “**Copy column**” and “**Copy cut and paste selected rows**” in RiskyProject Data sheets. You can also copy data, associated with charts to the clipboard: These charts are:

- Simulation Results chart
- Probability Density chart
- Tracking chart
- Tracking chart within **Tracking Tab** of the **Task information** dialog box

Images and Pictures

You can copy or save images associated with all charts and all views with the exception of the Resource and Simulation Results charts. Images can be copied to the clipboard or saved as a JPEG, BMP, TIFF, PNG or GIF file.

Copying an image from a chart

- Right-click on the image and choose a copy command. You can also copy the content of a view (e.g., Project view) to the file or clipboard

Copying the content of a view

- Click the **Schedule** tab. In the **Format** group, click **Copy Picture** . The **Copy Picture** dialog box opens.

Exporting Projects

You can export project data to a variety of 3rd party applications. You may export data to Microsoft Project XML format, or MPX format. Most project management scheduling software supports Microsoft Project XML format. While Microsoft Project no longer saves data in the MPX format, it can still read this format.

Exporting data to XML or MPX formats

1. From the **File** menu, choose **Export> XML** or **Export> MPX** and enter the file name. The Export Data dialog box opens.
2. You can export either the current project schedule or the results of the analysis. You must select the type of the schedule you want to export.



MPX files do not support all RiskyProject data including risks. Therefore, when you export data to MPX file and import it back, you can lose information.

Exporting Data to Excel

You can export data from data tables directly to Excel. A new instance of Excel will be launched every time you export the data. To export data to Excel:

1. Navigate to the table you want to export
2. From the **File** menu, choose **Export> Microsoft Excel**. The **Export Data** dialog box opens.
3. Choose if you want to export all table or only selected rows. Also, choose formatting of the header and data: fonts, background color, and border.
4. Click **OK**.

Exporting Results of Analysis to Microsoft Excel

You can export statistical data for a group of selected tasks to the comma-separated (CSV) file for use in Microsoft Excel. For the selected tasks, the csv file contains the following simulation results: duration, cost, start and finish time, and work for all iterations.

1. Open any view that contains task information, such as Project View, and select tasks you want to export
2. From the **File** menu, choose **Export> Statistics...**
3. Enter the file name for comma separated (CSV) file and click **OK**. You can now open this file Microsoft Excel.

Launching Microsoft Project

You can launch Microsoft Project directly from RiskyProject. In these cases, a temporary XML file will be created and passed as an input to the Microsoft Project. RiskyProject will try to get a location of Microsoft Project from the system registry. If RiskyProject cannot find the Microsoft Project, you can browse to find it.

Additional Information

Frequently Asked Questions

What is the difference between qualitative and quantitative risk analysis in RiskyProject?

If you do not have a schedule for your project, RiskyProject will only perform qualitative risk analysis. However, if you add a schedule by either adding activities or importing a schedule, RiskyProject automatically switches to quantitative analysis. You may switch between qualitative and quantitative analysis by adding or removing a project schedule.

How do I assign risks to tasks?

You can assign risks to task using four methods in RiskyProject.

1. **Risk Register:** if you are using the Risk Register, you can assign a risk and mutually exclusive risk alternatives to tasks by double-clicking on the risk in the risk register and assigning tasks to the risk in the **Assign to tasks or resources** tab.
2. **Risk Assignment View:** double-click on a risk ID in Risk Assignment view and use the **Risk Assignment Information** dialog to re-assign risks to task or resources or make them global.
3. **Risk Tabs on Task Information and Resource Information dialog boxes:** you can create and assign local risks to a task using this method. This is the preferred method if you want to assign a few different risks to separate tasks or resources.

How should I use the risk register?

You should use the risk register as the central place to define your project's risk breakdown structure. Once you have added the risks, from the risk register you can:

1. Add risk properties (date created, recorder, owner, etc.)
2. Assign risks to tasks and resources
3. Sort and filter risks
4. View risk status, including results of mitigation efforts. Risks can be opened and closed, risk and issues, or threats and opportunities.

When should I correlate risks and how do I do it?

Risk correlations are useful when the two risks are likely to occur together. For example, the risk "bad weather" is correlated with the risk "late delivery of materials". You can create risk correlations in the Correlations tab of the Risk Assignment Information dialog box in the Risk Assignment view, as well as risk tabs for tasks and resources.

RiskyProject uses only strong correlation between risks. If Risk 1 has chance of occurrence is 10% and Risk 2 chance of occurrence is 20% and both risks are correlated, Risk 1 will always occur when Risk 2 occurs, but Risk 2 may occur when Risk 1 does not occur.

How are risk probabilities, impacts, and scores calculated for quantitative analysis?

Risk probabilities, impacts, and scores are calculated the following way:

1. RiskyProject tracks the impact of each risk on each project parameter at each iteration of the Monte Carlo simulation. It is performed using absolute units. For example, in the first iteration Risk A caused a delay of 2 days.
2. RiskyProject also calculates duration, cost, success rate, finish time, and work on each iteration.

3. RiskyProject calculates the Spearman Rank Order correlation coefficient between duration impact for each risk and project duration. This coefficient is presented in the Sensitivity view.
4. Correlation coefficients are not yet a risk impact. They only show how the risk affects the project. If a correlation coefficient is low, and the risk is not correlated with duration, it means than some other factors affect duration other than this risk. To become an impact, the correlation coefficient must be normalized. For example, you have a schedule, which has only one risk with an outcome of an increase in duration of 2 days. The correlation coefficient will be 100% because the schedule does not have any other uncertainties. Now change the risk outcome to 100 days. The correlation coefficient again will be 100%. Risk impact takes into account absolute value of duration increase, cost increase, etc. If the duration increases 2 times when compared with the original project schedule, the normalization coefficient is 1. Otherwise, the normalization coefficient will be greater or less than 1. Impact equals correlation coefficient multiplied with the normalization coefficient.
5. Risk probability is calculated based on the chance of risk for each assignment. If a risk has only one assignment, calculated probability equals input chance. If the risk has multiple assignments which are not mutually exclusive alternatives, the probability is calculated by combining risk results of each iteration as shown in the example:

Risk Assignment	Iteration 1	Iteration 2	Iteration 3	Iteration 4	Iteration 5
Assignment to Task 1	occurred			occurred	
Assignment to Task 2		occurred		occurred	occurred

Combined probability will equal 80%

6. Risk score equals probability multiplied by impact.
7. For risks affecting All Parameters (combination of duration, cost, safety, quality, etc.) calculated impact is calculated using impact for each risk category, multiplied on relative importance of risks for this category. For schedule related risk categories risk impact on finish time and success rate will not be used to calculate risk impact. For schedule related risk categories, the risk impact on finish time and success rate will not be used to calculate risk impact. This relative importance can be seen on the Categories and Outcomes dialog (Risk tab).

How can I update a project schedule from Microsoft Project and keep my assigned risks?

You may use the RiskyProject toolbar or ribbon in Microsoft Project to transfer a schedule from Microsoft Project to RiskyProject. When you use the RiskyProject toolbar or ribbon, your schedule in Microsoft Project will be associated with risks and uncertainties defined in RiskyProject. Please read “RiskyProject for Microsoft Project” for more information.

When you import (click **Import** on the **File** menu) an updated schedule from Microsoft Project, RiskyProject gives you the option of completely overwriting the existing schedule or updating the existing schedule with new data in Microsoft Project, while retaining global and local risk assignments. This is useful if you originally exported the schedule and assigned risks to the project. RiskyProject keeps unique task IDs from Microsoft Project.

How do I rank schedule related and non-schedule risks together?

RiskyProject calculates the relative impact of both schedule-related and non-schedule risks in such a manner as to provide a valid comparison of both types of risks in regard to potential impact on the project. The basis of this comparison is the relative weight (importance) that you assign to each risk category. You can view the impact (threat or opportunity) of each risk in the Risk Matrix view and Risk Register view. In the Risk Tabs of Task Information dialog box and Resource Information dialog box you will find an impact of the risk on all parameters under “All” (Calculated impact on all project parameters) column.

How do I plan a risk response?

Risk response planning is done in the Mitigation or Response view in the Risk workflow. Risk responses are the duration and cost effects of activities that will occur if a risk occurs. These activities can be modeled in a similar manner as a risk with an outcome and result. Risk Mitigation and Response view can be useful, if you have many risks causing the same response.

You assign the risk response to a risk as a risk outcome “Execute Response Plan” and the response plan as the result.

For example, you have two risks “Problem with supplier” and “Problem with the component” that will initiate the same response “Replace Component”. If you define “Replace Component” and assign it to both risks using the risk outcome “Execute Response Plan”, the response plan will be executed only once even if both risks occur together.

How can I compare mitigation efforts using different baselines?

There are two methods to view the results of your mitigation planning against the original schedule. To compare the results, first create a baseline using the results from the original schedule. Model the planned mitigation efforts in your current schedule taking into account any additional activities and costs that the mitigation efforts will entail (these may also introduce additional risks)

In the risk register, use the Configure Pre and Post Mitigation button to select the original baseline as the pre-mitigation and the current schedule as the post-mitigation. The risk register will display the risk impact and score of each risk for the pre and post mitigation schedules.

In the Manage Baselines dialog box, you can compare major project parameters of the two schedules: Duration, Finish Time, Cost, and Success Rate.

How many iterations are required in a simulation?

The number of iterations required depends upon the risks you have assigned to the project. Normally, the minimum number of iterations is 200 and can be adequate on small, non-strategic projects. However, if you have risks that have a very low chance of occurring, but have a potentially large impact, the results will not account for this risk unless you run sufficient simulations. For example, your project has a 0.5% chance of being cancelled due to political instability. You must run at least 200 iterations, just to ensure just to ensure that the simulation runs a single occurrence of this risk. To adequately model these types of risks, we recommend a minimum of 600 simulations.

What are mutually exclusive alternatives for risks and how does RiskyProject calculate them?

Mutually exclusive alternatives are used to calculate alternate outcomes for the same risk event that cannot occur at the same time. An alternative risk is similar to using a Boolean “OR” statement. Only one risk alternative can occur at the same time. For example, if you have a fire

risk, the fire could be minor or major each with different outcomes. They are the same risk, but unlike other risk events, these alternatives cannot occur at the same time.

In this example, the risk Fire has two alternatives:

Chance	Outcome	Result
10%	Fixed delay	2 days
2%	Relative delay	45%

When the simulations are run, there is a 12% chance that the risk Fire will occur. 10% of the time the outcome of the minor fire will be calculated, while 2% of the time the outcome of a major fire is calculated, but they are never calculated during the same simulation.

How do I customize risk outcomes?

You can add or customize non-schedule risk categories and outcomes (cost and schedule outcomes are hard coded and cannot be edited). RiskyProject provides several default risk categories and outcomes (Legal, Safety, Quality, etc.). Click the Risks tab, and in the Settings group click Risk Categories and then the **Outcomes** tab. You may use the Risk to add or modify non-schedule risk categories and outcomes. You may also enable or disable certain outcomes, so they are not shown in the dropdown list when you do risk assignments.

We recommend that you modify the default risk outcomes so that they can be used across your organization. These outcomes are saved in the system registry and can be used for all projects.

I imported a schedule from Microsoft Project to RiskyProject. Are there any potential differences?

In most cases, if you import your project schedule from Project, the projects in both applications will be identical. However, there are specific cases that may cause slight differences:

1. RiskyProject currently does not support split tasks. However, RiskyProject will import work calculated using split tasks. RiskyProject does not have task usage or resource usage views. The note for the task will be generated, then the task imported to RiskyProject as a split task.
2. RiskyProject calculates task duration differently than Microsoft Project in cases where resources that have different calendars are attached to the same task. However, even in these cases, start and finish times of the tasks will be identical.
3. RiskyProject does not support overtime rates.
4. RiskyProject does not import resource groups. Each resource is imported individually.
5. RiskyProject does not support the earned value method “Percent work completed”. Instead, it uses “Percent completed”.

How can I define opportunities versus threats?

When you create a risk assignment, define a negative outcome result that translates to an opportunity. For example, fixed delay –2 days indicates that if the event occurs, the task will require 2 fewer days to complete and is an opportunity.

How can I import low, base, and high duration from Microsoft Project?

Use the following fields in Microsoft Project to represent Low, Base, and High durations:

1. Duration1 for Low Duration
2. Duration2 for Base Duration

3. Duration3 for High Duration

Please remember that $\text{Duration1} < \text{Duration2} < \text{Duration3}$

Why is the high result for duration or cost for the current schedule different from the high results?

Low and high estimates for inputs, which you define for each task, are different from low and high results because their actual meanings are different.

1. You define the definition for low and high estimates for duration, cost, income input in the **Distributions** tab of **Task Information** dialog box. This can be interpreted differently depending upon what distributions you select. By default, low distribution inputs are P10 and high is P90.
2. You define the definition of low and high results for duration, cost, and income in the **Calculation** tab of the **Options** dialog box as a percentile of statistical distribution obtained as a result of your analysis. By default, low distribution results are P10 and high are P90.

Glossary

Actual Cost	Cost that is accrued during a course of task or project. RiskyProject calculates actual cost automatically based on tracking data. Alternatively, you can enter this cost manually if you uncheck a flag in Options (cost tab).
Actual Start Date:	The start date of a task based on tracking data. Actual start dates can be input using the Tracking tab in Task Information dialog box. The Result Giant chart takes into account the actual start date. In addition, the Gantt chart shows actual start dates.
Assignment (for Resources)	Resources are assigned to particular tasks. Each assignment is defined by a resource name and the number of units allocated for the task. Assignments are defined in the Task Information dialog box.
Assignment (for Risks)	See Risk Assignment
Assignment Units	The percentage of a work resource's time assigned to a task.
Base Calendar	A calendar that can be used as a project and task calendar that specifies default working and nonworking time for a set of resources. Differs from a resource calendar, which specifies working and nonworking time for an individual resource.
Baseline Project Schedule (Baseline)	The baseline project schedule is a snapshot of the project schedule. Baselines are saved without taking into account risks, uncertainties, and tracking information. RiskyProject uses an unlimited number of project baselines. Current baseline project schedules are shown in the Project view. The current baseline name is shown in the status bar. You may create baseline, restore baseline, or delete baseline. Baselines are very useful for analysis of mitigation efforts.
Budgeted cost	Cost associated with current project schedule.
Calendar	Calendar is a set of working and non-working times and days. Calendars are defined in Working Time dialog box. RiskyProject uses project, task, and resource calendars. Any number of calendars can be created.
Chance of Risk Occurrence	Chance that the selected risk, assigned to the task or resource or particular risk alternative, would occur. In this document, the chance of risk occurrence usually refers to the input chance for a risk assignment. Risk probability refers to the calculated probabilities for this risk, which can be different.
Closed Risk or Issue	Risks or issues that previously affected the project, but were analyzed, addressed, mitigated, and no longer affect the project. You may switch between opened and closed risks in the Risk Information dialog of Risk Register .

Constraint	A restriction that is set on the start or finish date of a task. If you enter a new task by specifying parameters (task name, duration, etc.) rather than start and finish dates, RiskyProject does set a constraint and the task will start and finish as soon as possible. If you specify a start date, a constraint is set to Start No Later Than. If you specify a finish date, a constraint is set to Must Finish On. You can change or remove constraints in the General tab of the Task Information dialog box. Constraints for start or finish dates are indicated using an orange background in all views.
Cost Per Use	Per-use costs are one-time fees for the use of a resource, such as equipment. Per-use costs never depend on the amount of work done. Instead, they are one-time costs that are incurred every time that the resource is used. Although a per-use cost for a work resource depends on the number of assignment units used, a per-use cost for a material resource is applied only one time. Cost per use is defined in Resource View .
Current Schedule	The deterministic project schedule that is currently active and used for probabilistic calculations. In most cases, it is the original project schedule you created or imported from other project management software. You may also set a baseline, which you previously created. See “Baseline Project Schedule (Baseline)” for more information.
Duration	The total span of working time required to complete task or the whole project. Task duration can be input in months, weeks, days, hours, and minutes, as it is specified in Options dialog box (Duration tab). Normally, duration is calculated in hours. Duration is calculated using your current calendar.
Effort Driven Scheduling	The duration of a task shortens or lengthens as resources are added or removed from a task, while the amount of effort necessary to complete a task remains unchanged
Finish date	The date the task is scheduled to be completed. The start date is calculated based on successors, predecessors, constraints, and task durations using the current calendar.
Fixed Duration Task	A task in which the duration is fixed. Any changes to the work or the assigned units [that is, resources] will not affect the task’s duration. This is calculated as follows: Duration x Units = Work.
Frequency Chart	This chart plots the number of samples or probability versus the value of the variable. Frequency charts allow you to analyze the risk associated with a variable. All frequency charts in RiskyProject are interactive. By moving the slider, you can check the chance that the project will be completed within a given period, or what is the chance that the cost of the project will be within budget. Frequency charts can be combined with cumulative probability chart for the same variable.
Gantt Bar	A graphical element of the Gantt chart that represents start, finish times, and duration of the task.

Global Risk Assignment	A stochastic event, which affects all tasks or resources in the project. Global risks are presented in the Risk Assignment View. You may also use Risk Register to assign global risks.
Issue	Event that has already occurred. Issues could be viewed in Risk Register. Risks can be converted to issues using the Risk Information dialog from Risk Register. When risks become an issue, the chance of risk occurrence would become 100% for all risk assignments. You have to manually set the chance of risk occurrence to 100% for all mutually exclusive alternatives.
Lag	The delay between the finish of the predecessor and the start of the successor task. Lags can be probabilistic. They are defined by statistical distribution.
Legend	The Legend appears by default at the bottom of each view. It contains practical information for each view. By default, legends are turned off. They can be toggled on and off from the View menu or the Options dialog box (View tab). In addition, legends can be turned off by clicking the X in the title bar of legend.
Material Label	Material resource property: name of material units (e.g. ton).
Material Resources	The supplies or other consumable items used to complete tasks in a project. RiskyProject treats both work and material resources differently during calculation.
Maximum Units	Parameters associated with work resources. These are used in analysis of resource allocation: a resource will be over-allocated if the maximum units are exceeded.
Milestone	A reference point indicating a major event in the project. Milestones are used to monitor the project progress. Milestones in RiskyProject may or may not have zero duration. If the task has zero duration, it is automatically displayed as a milestone.
Monte Carlo	The mathematical method used on risk analysis. Monte Carlo simulations are used to approximate the distribution of potential results based on probabilistic inputs. Each simulation is generated by randomly pulling a sample value for each input variable from its defined probability distribution. These input sample values are then used to calculate the results (in RiskyProject, it is project schedule parameters: project duration, start and finish times, success date, and cost). This procedure is then repeated until the probability distributions are sufficiently well represented to achieve the desired level of accuracy. The probability distribution to be used for these inputs is dependent on the types of numbers you want to generate.
Non-schedule Risk Outcomes	Risk outcomes, which do not affect project schedule directly. Examples are safety related risk outcomes (reduce safety, accident, etc.), quality related outcomes (reduce quality), etc. See risk outcomes for more information

Opened Risk or Issue	Risk or issue that is currently active and may affect your project schedule. You may switch between opened and closed risks in the Risk Information dialog of Risk Register .
Opportunity	Risk event, which positively affects the project. In RiskyProject, opportunity is determined based on the results of risk outcomes. If a result is negative, (for example fixed delay is -2 days) it is an opportunity. Otherwise, it is a threat.
Overallocation	An over-allocated resource has more work assigned than can be done in the resource's available time. Overallocation is the number of hours a resource is scheduled for all assigned tasks over the resource's available time. Overallocation is shown within the Resource view. Use the shortcut menu (right-mouse click) to switch between the different types of charts available in the Resource view.
Peak Units	The highest level at which a resource is scheduled for all assigned tasks during a given period. Peak units are shown in the Resource view. Use the shortcut menu (right-mouse click) to switch between the different types of charts available in the Resource view.
Percent Allocation	The percentage of a resource's capacity for all assigned tasks during a given period. Percent allocation is shown within resources view. Use the shortcut menu (right-mouse click) to switch between the different types of charts available in the Resource view.
Predecessor	A task that must start or finish before another task starts or finishes.
Project Calendar	The base calendar used by the project. Project calendar is used for scheduling tasks if task or resource calendars are not defined.
Projected Duration	The task duration, which is recalculated, based on current schedule task duration and tracking data.
Resource Calendar	A calendar that specifies working and non-working time for a specific resource. A resource calendar differs from a project calendar, which specifies working and non-working time for more than one resource.
Resource Information dialog box	This dialog box contains General and Risks information about particular resources. The Resource Information can be viewed by double clicking on any not editable field associated with the resource in the resource view, for example on resource ID. The Resource Information dialog box can also be opened using shortcut menu in resource view.
Resources	People, materials, and costs used to complete tasks.
Risk	A stochastic event that can be applied to tasks or resources and affects project schedules. Risks are defined by name. When risks are assigned to tasks or resources, you need to define their chance of occurrence, outcome, and time of occurrence.

Risk Assignment	Risk can be assigned to all tasks or resources (global) or particular task or resource (local). When you perform risk assignment, you need to define chance of risk occurrence, risk outcome, result, and moment of risk. If risk is not assigned to any tasks and resources, it will remain in the Risk Register but will not be used for risk ranking and will not affect your project schedule.
Risk Category	Group of risk outcomes. RiskyProject calculates risk impacts and scores for each category. For example, one of the default risk categories is safety. It has a number of outcomes: reduce safety, injury accidents, etc. Risks within these outcomes will be ranked together.
Risk Impact	RiskyProject calculates risk impact for duration, cost, and combined for all parameters as a result of sensitivity analysis, normalizes it, and presents it within different views, including Risk Register, and Risk Matrix. Red for threat-type risk impact means there is a strong correlation between the risk and project duration/cost. Yellow means that there is a medium correlation between the risk and the project duration/cost. Green means there is a weak or no correlation between the risk and project duration/cost. Colors for opportunity type risk impacts are the opposite. If a risk has threats and opportunities, its color is not defined.
Risk Matrix	The view presenting risk probability versus risk impact within matrix. Risk matrix uses different colors (red, green, and yellow) to represent severity of the risk. In RiskyProject, risk matrix can be viewed separately for risks and opportunities.
Risk Outcome Type	A result if a risk occurs. In quantitative analysis risk outcome types can be schedule-related and non-schedule. Multiple risk outcome types can be combined in risk category. You can customize non-schedule risk outcome types, as well as enable/disable schedule risk outcome types using the Categories and Outcomes dialog. If a risk is assigned to a task, the outcome type can be Increase cost, Delay Restart End task, Cancel task Cancel task + all successors, Cancel Project, and others. If a risk is assigned to a resource, the outcome type can be Increase cost, Delay, Restart, End task, and others. If an outcome is set to No impact, the risk is ignored.
Risk Probability	Calculated chance that event would occur. Risk Probability is shown in Risk Matrix, Risk Register, and other views and dialog boxes, where risks information can be viewed. In this document, chance of risk occurrence usually refers to input chance for risk assignment. Risk probability refers to the calculated probabilities for this risk, which can be different.
Risk Properties	Attributes, associated with the risks. Examples of these risk properties include when risk is created or modified, name of record, name of contact, and other information. Default sets of risk properties are defined in Default Risk Properties dialog. Actual values of these risk properties are entered in the Risk Information dialog of Risk Register .

Risk Register	The set of all risks. Includes input parameters: opened or closed, risk or issue, and properties. Also, includes calculated parameters: threat or opportunity, pre- and post-mitigation probability, impact, and score. Risks from Risk Register should be assigned to tasks or resources. Risk Register is shown in Risk Register view.
Risk Score	Calculated risk impact multiplied by risk probability. Risk score can be viewed in Risk Register view and Risk Matrix view. You may sort all risks based on risk score in Risk Register .
Schedule	The timing and sequence of tasks within a project. A schedule contains tasks with dependencies, as well as other project information.
Schedule Related Risk Outcome types	In quantitative risk analysis, Risk outcome types that directly affect project schedule. Examples are restart task, fixed delay, and fixed cost increase. Schedule related risk outcome types are hard coded, but you can enable or disable them. See Risk Outcome Types for more information
Start date	The date when task is scheduled to begin. The start date is calculated based on successors, predecessors, constraints, task durations using current calendar.
Statistical Distribution	An arrangement of values or variables showing their observed or theoretical frequency of occurrence.
Subtask	A subtask is a task that is part of a summary task. The subtask information such as cost and duration is consolidated into the summary task. Summary task and subtasks can be outlined using the Indent and Outdent buttons located on the Formatting toolbar, as well as the Indent and Outdent menu items.
Success Rate	The chance that a task or project will be completed. A task success rate of 56% means that there is a 56% chance that this task will be completed and 44% percent chance that it will be canceled. A task can be canceled when either it reaches a task or project deadline, or if a risk with a Cancel task , Cancel Task + all successors or Cancel Project outcome type occurs. A project can be canceled either when it reaches the project deadline or if a task, risk with a Cancel Project outcome occurs. The task success rate is shown on the Success Rate view, but it can be requested within any view. The Project success rate is shown in the Project Information view.
Successor	A task that cannot start or finish until another task starts or finishes.
Summary Task	A task that encompasses and summarizes the duration and costs of all tasks in a group. Summary task and subtasks can be outlined using the Indent and Outdent buttons located on the Formatting toolbar, as well as the Indent and Outdent menu items.

Task Deadline	<p>A target date for the completion of a task. Task deadlines are defined in the Deadlines tab of Task Information dialog box. You can assign different actions for when a deadline occurs: the deadline can be ignored in the scheduling process and the task can be canceled with or without affecting the success rate. Deadlines are displayed as a red arrow in Gantt charts. Deadline arrows can be turned off and on in the Project Options (Calendar) tab).</p>
Task Dependencies	<p>The type of link between different tasks. There are four types of task dependencies:</p> <ol style="list-style-type: none">3. Finish-To-Start: Task 2 (successor) cannot start until task 1 (predecessor) finishes4. Start-To-Start: Task 2 (successor) cannot start until task 1 (predecessor) starts5. Finish-To-Finish: Task 2 (successor) cannot finish until task 1 (predecessor) finishes6. Start-To-Finish: Task 2 (successor) cannot finish until task 1 (predecessor) starts <p>Task dependencies can be defined in the Task Information dialog box (predecessor tab). They can also be defined using the toolbar buttons.</p>
Task Information dialog box	<p>Information regarding a specific task is organized using a series of tabs (General, Predecessors, Resources, Deadline, Risks, Distributions, Tracking, and others). The dialog box can be opened by double-clicking on any non-editable field associated with a task in the task view. A task ID is an example of a non-editable field. You can also open the Task Information dialog box using the shortcut menu in the task view, or choosing Project> Task Information from the menu.</p>
Task	<p>An activity or job that has a start date and time, an end date and time, duration, and other properties. A Project is comprised of tasks.</p>
Task Calendar	<p>The base calendar that you can apply to individual tasks to control their scheduling, usually independent of the project calendar or any assigned resources' calendars. By default, all tasks use the project calendar.</p>
Threat	<p>Risk events that negatively affect the project. In RiskyProject, a threat is determined based on the result of a risk outcome. If the result is positive (for example, fixed delay is 2 days) it is threat. Otherwise, it is an opportunity.</p>
Time scale	<p>The time period indicator that appears at the top of the various Gantt charts, the Resource charts, frequency and cumulative probability plots, and tracking plot. Time scale always has two tiers. Information in timescales is automatically adjusted based on the resolution of the particular chart.</p>

View	A graphic user interface component, which may combine charts and worksheets. RiskyProject has 12 views. You can navigate between views using the ribbon or the Workflow bar. The order of the views in the workflow bar reflects the recommended project risk management workflow.
Work	For tasks, the total labor required to complete a task. For assignments, the amount of work to which a resource is assigned. For resources, the total amount of work to which a resource is assigned for all tasks. Work is different from task duration.
Work in Resource Chart	Total number of hours a resource is scheduled for all assigned tasks during a given period. Work is shown within Resource view. Use the shortcut menu (right-mouse click) to switch between the different types of charts available in the Resource view.
Workflow bar	Located on the left of the RiskyProject workspace, the Workflow bar allows you to quickly select and open Views. The order of the views in the workflow bar reflects the recommended project risk management workflow. The Workflow bar can be turned on and off from within the Options dialog box (view tab) or the View menu. In addition, the Workflow bar can be turned off by clicking the X in the title bar (top of workflow bar).

Index

2

24 hours calendar, 78, 80

3

3-point estimates
adding, 111
adding cost and income, 110, 111
adding for duration and cost, 110
adding lags, 111
managing uncertainties, 110
most likely values, 110

A

actual
cost, 77, 139
income, 77
start date, 139
tracking, 122
Addin
adding estimates to Microsoft Project, 67, 69
setting up, 66
adding
3-point estimates, 111
constraints, 89
deadlines, 91
estimates to Microsoft Project, 67, 69
fixed costs to tasks, 97
fixed income to tasks, 97
predecessors, 87
resources, 94
risk categories, 53
risks, 22
advanced task management, 92
afternoon off calendar, 80
AHP, 54
analytical hierarchy proces, 54
assigning
calendars to resources, 95
estimates to found tasks, 112
global risks, 100
local risks, 100
mitigation plans, 41
resources to tasks, 94
Risk Assignment View, 104
risk response plans, 41
risks in risk register, 103
risks in the task information dialog box, 105
task to mitigation or response plan, 32
uncertainty to costs and income, 98

B

baselines
calculations, 116

project schedule, 139
BMP, 46, 125, 131
budgeted cost, 139

C

calculations
cost, income, and profit, 96
defaults, 76
deterministic, 116
probabilistic, 116
calendars, 139
assigning to resources, 95
base, 78
creating calendars, 80
project calendars, 78
renaming, 80, 81
resource calendars, 79
setting calendar defaults, 75
setting up, 78
standard calendar, 80
task calendars, 79, 92
chance, 25, 27
risk occurrence, 139
charts
Frequency, 140
Resource, 118
Result Gantt, 117
Risk Matrix, 44
Risk Trend, 44, 61
showing or hiding risks, 107
Tracking, 122
clipboard, 17, 46, 130
columns, 16, 22, 40, 54, 56, 85, 87, 97, 101, 130, 136
constraints, 85, 140
adding, 89
affect on probabilistic and deterministic calculations, 89
convergence, 76, 116
converting
qualitative to quantitative risk analysis, 101
copying
pictures, 131
project data, 130
rows, 17
correlation coefficient, 135
cost of risk, 38
cost rate tables, 95
costs, 74, 85, 102
calculations, 96
fixed, 97
per use, 94, 97, 140
setting up fixed cost defaults, 77
setting up variable cost defaults, 77
variable, 97
creating
base calendars.
calendars, 80
milestones, 90

- mitigation and response plans, 31
- projects, 82
- summary tasks, 86
- tasks, 85
- criticality index, 76
- cumulative probability, 145
- currency, 77
- current schedule, 116, 117, 124, 140
- customize
 - risk outcome types, 25
 - risk properties, 40
- cutting
 - rows, 17

D

- Dashboard
 - risk, 49
- data sheets, 16, 21
- deadline
 - adding, 91
 - task, 90
- defaults
 - duration, 75
 - editing default risk properties, 55
 - setting calendar defaults, 75
 - setting project defaults, 74
 - setting up calculation defaults, 76
- defining
 - maximum simulations, 76, 116
 - work, 95
 - working time, 80
- deleting
 - calendars, 81
 - items, 17
 - risks, 22
- dependencies
 - linking tasks, 86
- due date, 40
- duration, 74, 85, 140
 - fixed, 93
 - setting defaults, 75

E

- effort driven scheduling, 92, 140
- event chain methodology, 10
- Excel
 - export, 24
 - integration, 132
- exporting
 - projects, 132

F

- filtering
 - risk register, 23
- finding
 - text or data, 111
- fixed
 - duration, 93
 - units, 93

- work, 93
- fixed costs, 97
 - adding to tasks, 97
 - setting up defaults, 77
- fixed duration task, 93, 140
- fixed income, 97, 102
- formatting
 - Gantt Bars, 93
 - Risk Matrix, 55
- formula to calculate combined impact, 61, 62
- free slack, 76
- frequency chart, 140

G

- Gantt bars, 140
 - formatting, 93
- GIF, 46, 125, 131
- global options, 74
- Global risks, 100, 101, 103, 106, 141

I

- images
 - copying and saving, 131
- importing
 - existing schedules, 82
 - keep assigned risks, 135
 - xml, 82
- income
 - calculations, 96
- indent, 31, 55, 86, 94, 144
- inserting
 - items, 17
- interface, 12, 146
- issues, 30, 33, 107, 134, 139, 141

J

- JPEG, 46, 125, 131

L

- lags, 87, 141
 - uncertainties, 111
- late finish, 76
- late start, 76
- legends, 74, 141
- linking
 - tasks, 86
- Local risks, 100, 106
- lognormal distribution, 75

M

- mapping
 - Microsoft Project fields, 66, 67, 69
 - XER file fields, 72
- material label, 94, 141
- material resources, 94, 141
- maximum
 - number of iterations, 67, 76
 - number of periods, 61

number of rows, 17
 property value, 55
 mean, 116, 124
 Microsoft Project, 64, 82, 83, 132, 135, 137
 using actuals, 122
 Milestones, 89, 90, 141
 creating, 90
 mitigation, 21, 31, 103
 assigning mitigation plans, 41
 assigning task to plan, 32
 subplans, 31
 summary plans, 31
 moment of risk, 104
 Monte Carlo
 enabling simulations, 109, 116
 simulations, 116, 141
 morning off calendar, 80
 most likely cost, 111
 most likely duration, 111
 mutually exclusive alternatives, 26

N

night shift calendar, 80
 non-schedule
 risk outcomes, 141
 risks, 136
 normal distribution, 75
 NPV (Net Present Value), 77

O

opportunities, 27, 44, 45, 142
 outcome, 27
 outcome types, 25, 27, 52
 overallocation, 118, 142

P

peak units, 118, 142
 percent allocation, 118, 142
 performance monitoring, 122
 PNG, 46, 125, 131
 predecessors, 87, 140, 142, 144
 printing
 reports, 130
 results, 130
 probabilistic
 calculations, 75, 84, 89, 116
 calendars, 79, 116
 profit
 calculations, 96
 Project Summary view, 16, 84
 projected duration, 122, 142
 projects
 calendars, 78, 142
 creating, 82
 exporting, 132
 settings, 84
 start time, 84
 viewing summary, 16
 properties
 editing default, 55

risk, 30, 55

Q

qualitative risk analysis, 10, 14, 25, 26, 52
 settings, 51
 quantitative risk analysis, 10, 14, 25, 31, 33, 34, 52

R

ranking risks, 20, 135
 renaming
 calendars, 80, 81
 risks, 24
 tasks in Microsoft Project, 83
 views of Risk Register, 24
 reports
 risks, 47
 resource calendars, 79, 142
 resources
 assigning calendars, 95
 assigning to tasks, 94
 chart, 118
 cost rate tables, 95
 response plans, 21, 31, 103, 136
 Result Gantt, 16, 117, 122
 result of outcome, 103
 results
 printing, 130
 showing low and high, 117
 tracking, 123
 risk, 75, 142, 145
 adding, 22
 assigning local and global risks, 103
 assignments, 107
 attributes, 33
 chance, 25
 closed, 21
 cost calculations, 38
 current probabilities, impacts, scores, 29
 definition, 142
 deleting, 22
 editing default risk properties, 55
 filtering and sorting, 23
 form, 36
 history, 43
 impact, 28, 103, 135, 143
 issue, 21
 lesson learned, 21
 mitigation, 31
 open, 21
 original probabilities, impacts, scores, 28
 outcomes, 143
 post-mitigation probabilities, impacts, scores, 30
 probabilities, 25, 143
 properties, 30, 55, 143
 ranking, 20, 54
 report, 47
 response, 31
 scores, 20, 23, 28, 42, 44, 100, 135, 136, 144

- scores non-linear, 57
- severity, 44, 45, 59, 61
- tolerance, 44, 55, 103
- weighting, 54
- risk assignments, 100, 101, 102, 143
- risk categories, 143
 - about, 24
 - adding, 53
 - managing, 52
- risk correlations, 108
- Risk Form, 36
 - Editing Mode, 36
 - Published Mode, 36
- risk ID, 23, 33, 51
- Risk Matrix, 44, 46, 103, 136, 143, 144
 - formatting, 55
 - setting non-linear intervals, 57, 58
- risk outcome types, 25
- risk outcomes, 25
 - weighting, 54
- Risk Register, 20, 21, 33, 55, 100, 103, 134, 136, 144
 - filtering, 23
 - sorting, 23
- risk reviews, 40
 - entering, 41
 - frequency, 40
 - view, 41
- Risk+, 70

S

- saving
 - pictures, 131
- schedule related risk outcomes, 144
- searching
 - text or data, 111
- seed, 88, 95
- setting up
 - addin options, 66
 - calendars, 78
 - cost defaults, 77
 - project units, 76
- showing
 - low/high results, 117
 - risks on Gantt chart, 107
- simulations, 76, 77, 116, 141
 - defining maximum simulations, 76, 116
 - running using Microsoft Project addin, 67
- sorting risk register, 23
- start date, 144
- statistical distribution, 110, 144
 - moment of risk, 104
- subprojects, 91
- subtask, 86, 144
- success rates, 23, 90, 123, 134, 135, 144, 145
- successors, 86, 144
- summary tasks, 144
 - cost calculation, 96
 - creating, 86
 - formatting, 93
 - tracking, 122
- sunrise and sunset, 33

T

- Tasks, 145
 - assigning resources, 94
 - calendars, 79, 92, 145
 - creating, 85
 - deadlines, 90, 145
 - dependencies, 86, 145
 - linking, 86
 - management, 92
 - tracking data, 125
 - types, 92, 93
- threats, 27, 44, 45, 145
- TIFF, 46, 125, 131
- time scale, 145
- total slack, 76
- tracking, 122, 123, 124, 125, 130, 139, 145
 - Tracking Gantt, 122, 123

U

- Uncertainties
 - assigning to costs and income, 98, 110, 111
 - assigning to duration, 110
 - assigning to lags, 111
 - managing, 110
- Units
 - fixed, 93
 - setting up project units, 76

V

- variable costs, 97
 - setting up defaults, 77
- viewing
 - menu, 141, 146
 - project summary, 16
 - Risk Matrix, 44, 45
 - risk review, 41
 - risks, 20
 - tracking data, 124
 - waterfall diagram, 42
- views, 146

W

- waterfall diagram, 31, 41
 - view, 42
- weighting
 - risk outcomes, 54
 - risks, 54
- Work, 146
 - default rate, 94
 - defining, 95
 - fixed, 93
 - in resource chart, 146
 - task types, 95
- workflow bar, 146
- workflows, 12, 122, 146
- working time, 79, 95, 139
 - defining, 80

X

XER, 72, 82, 83

XML, 66, 69, 70, 71, 82, 83, 132

