PEAT'S ENTERPRISE RISK MANAGEMENT & RISK REGISTERS:

Key Features and Functions

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PEAT's Enterprise Risk Management: Risk Register

- Risk KRI. Global Settings of Risk Indicator Categories (1-5 or 1-10) with Customizable Color Coding of KRI (Key Risk Indicators) via a Risk Matrix
- Risk Division. Creation of multiple Divisions within the Company, such that the company can manage multiple risk profiles for each division
- Risk Taxonomy (G.O.P.A.D.). Creation and assignment of G.O.P.A.D. categories (geographic, operations, products, activity or process, and department) such that analysts can slide-and-dice the company's risk profile from multiple points of view, select from and create queries of specific G.O.P.A.D. to analyze, etc.
- Risk Categories. Creation of customized Risk Categories or use our library of predefined risk categories
- Risk Managers. Creation of persons in charge of certain risks, complete with contact information
- Risk Mapping. Creation and Linking of Risk Categories to one or more G.O.P.A.D.s and on to one or more Divisions. This allows the analyst the ability to view how a certain risk permeates through the organization as well as how a specific risk element may touch multiple departments, divisions, processes, and so forth.

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PEAT's Enterprise Risk Management: Risk Register

- Risk Registers. Creation of *multiple* Risk Registers where each Risk Register has *multiple* Risk Elements consisting of Causes of Risk, Consequences of Risk, Risk Mitigation Response, Risk Manager Assignments, Risk Category, Risk Status, Likelihood, Impact, Key Risk Indicators (KRI), Risk Dates (Creation, Edit, and Due Dates), Total $ Risk Levels, Residual $ Risk Levels, Mitigation Cost, and so forth.
- Risk Dashboards. Creation of the following customized Risk Dashboard views complete with reports, data grids, charts, and visuals, where analysts can select from a specific G.O.P.A.D., Division, Risk Category, or Risk Dates:
  - Risk Elements (viewing KRIs and Pareto charts)
  - Risk Maps (risk heat maps of KRI counts)
  - Risk Groups (risk accumulation by G.O.P.A.D.)
  - Risk Exposure (risk dials and dashboards of the selected category versus the entire Company)
  - Risk Taxonomy (top-down view to drill-down and see the structure of the corporation and its risk associations, versus a bottom-up view of how a specific risk permeates throughout the corporation)
  - Risk Inventory (running SQL queries to obtain the customized risk profiles and risk reports by Division, G.O.P.A.D., Risk Category, Risk Dates, and so forth)
  - Risk Probability (computing PDF and CDF of the probability of a discrete risk event occurring or continuous risk amounts based on historical experience)

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PEAT's Enterprise Risk Management: Risk Register

- Risk Engagements. Creation of *multiple* Risk Engagement projects where each of the following subsections has *multiple* Risk Elements:
  - Pre-Engagement Risks
  - Engagement Risks
  - Lessons Learned (Post-Engagement)
- Risk Diagrams. Custom creation of your own Risk Diagrams with ready-made templates on Bowtie Hazard Diagrams, Cause and Effect Ishikawa Fishbone Diagrams, Drill Down Diagrams, Influence Diagrams, Mind Maps, and Node Diagrams. Users can create multiple custom risk diagrams using this tool.
- Risk Controls. Determine if a specific risk event is in-control or out-of-control… For instance, if the number of risk events such as a plant accident spikes within a certain time period, was that set of events considered expected under statistically normal circumstances or an outlier requiring more detailed analysis?
- Risk Forecasts. Using historical risk data, analysts can now apply predictive modeling to forecast future states of risk, as well as Risk Tracking, Time Series Risk Forecasts, PDF/CDF Likelihood of Occurrence, Snapshots per period and over time
- Risk Mitigation. Determine if a specific risk mitigation strategy or technique is working, at least statistically speaking… Collect data from before and after a risk mitigation strategy is implemented and determine if there is a statistically significant difference between the two…

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PEAT's Enterprise Risk Management: Risk Register

- Risk Sensitivity. Tornado Analysis helps identify the critical success factors or which risk element contributes the most to the bottom line risk profile of the company (or risk segment) by statically perturbing each of the risk element's financial risk levels
- Risk Scenarios. Scenario Analysis helps create multiple risk scenarios of your current or total risk amounts of individual risk elements to determine the impact on the corporate risk profile and create scenario heat maps
- Risk Simulation.
  - Simulation Assumptions. Run Monte Carlo Risk Simulations on your risk elements thousands to hundreds of thousands of times to generate probabilistic distributions and quantitative risk profiles
  - Simulation Results. Results from the Monte Carlo Risk Simulation run thousands to hundreds of thousands of times are presented as probability distributions and statistical moments, percentiles, and confidence intervals
  - Overlay Results. Overlay multiple risk profiles side by side to determine their respective impacts and uncertainty effects on the corporate risk profile
  - Analysis of Alternatives. Compare the simulated results of various risk profiles
  - Dynamic Sensitivity. Identify the contribution to variance and uncertainty of each risk element to the corporate, division or G.O.P.A.D. total as well as rank and identify the critical success factors or which risk element contributes the most to the bottom line risk profile when simulated in a dynamic setting
- Risk Reports. Auto generating Reports and extraction to Excel capabilities, as well as Pareto Charts, Risk Inventory, Risk Profiles by Division and G.O.P.A.D.

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PEAT's Enterprise Risk Management: Risk Register

- Risk Training. Knowledge Center slides, training materials, and videos are all fully customizable, including the following sections:
  - Step-by-Step Procedures
  - Basic Project Economics Lessons
  - Getting Started Videos
- Risk Security. Data Encryption and Foreign System Support. The software comes with a 256-bit encryption protocols to encrypt your Risk Database and supports foreign decimal settings (e.g., USA settings for one thousand dollars and fifty cents is $1,000.50 versus a Latin American peso of P1.000,50 with interchangeable decimal and thousand separators)
- User Manuals, Quick Getting Started Guides, and White Papers. The Help menu provides multiple Visual Guides, Whitepapers, and User Manuals to quickly get you started using the software.
- Additional Advanced Modules and Foreign Language Support. Multiple advanced analytical and decision analysis models accompany the PEAT software and complements the existing ERM module, including the Corporate Investment module, Project Management (Cost and Schedule Risk), and other relevant applications. The software also comes with multiple foreign language user interface.

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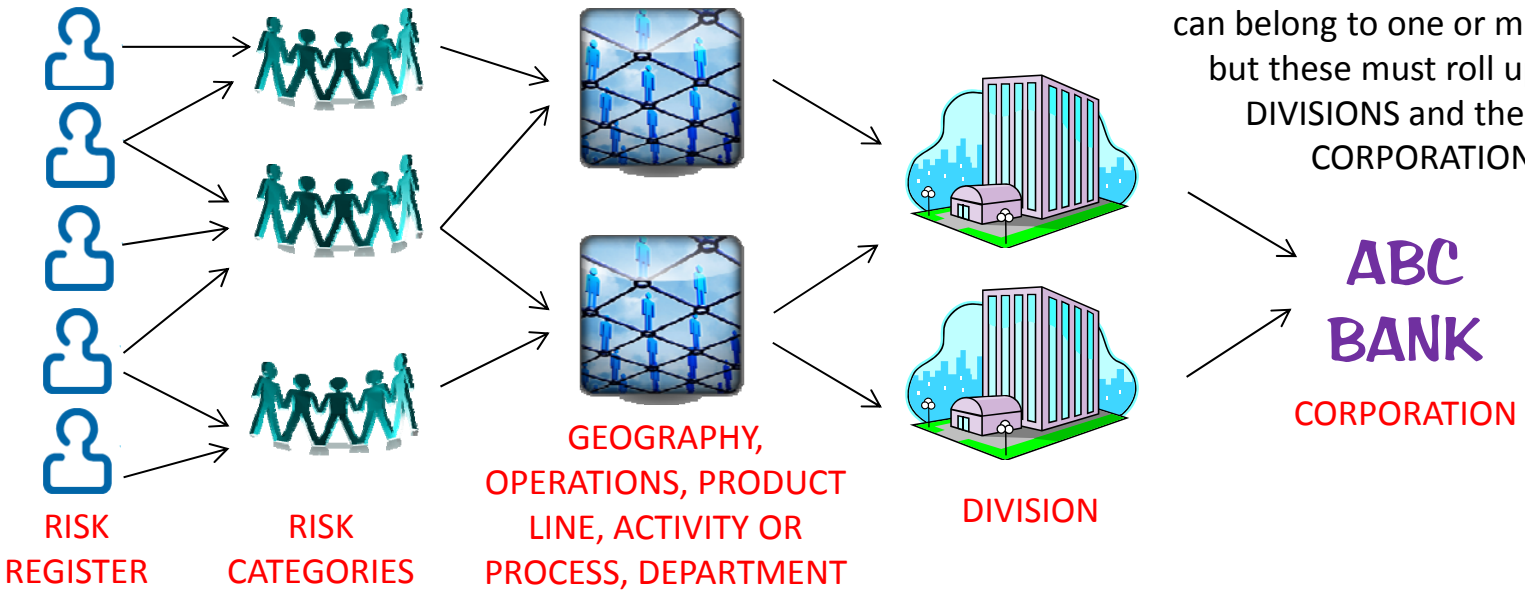
ROV Risk Register software has two elements: a WEB module and a DESKTOP module. The Web module handles data inputs from multiple end-users and creates basic tables, as well as being able to extract/export to an Excel template; the data in this template is then used or copy/pasted into the Desktop module for additional advanced analytics. The Desktop module can also handle additional analysis and data inputs that the Web element cannot, and it can also Import the data from the Web module at the click of a button.

ROV Risk Register has a sophisticated Database management system to handle multiple RISK REGISTERS (individual risk elements), which then comprise diverse RISK CATEGORIES that make up different GEOGRAPHY / OPERATIONS / PRODUCT LINE / ACTIVITY OR PROCESS / DEPARTMENT (G.O.P.A.D.), where all of which rolls up to various DIVISIONS that ultimately form the CORPORATE level. Association of each of these entities with their respective Risks can maintain the alignment necessary for efficient execution of risk mitigation plans at all levels. This allows users to "slice and dice" their risk data and view results from various points of view (e.g., risks pertaining to a specific geography, department, manufacturing process, product line, risk category, etc.)

RISK REGISTER elements may be attached to one or more RISK CATEGORIES, and each RISK CATEGORY can belong to one or more G.O.P.A.D.'s, but these must roll up into various DIVISIONS and then up to the CORPORATION once.



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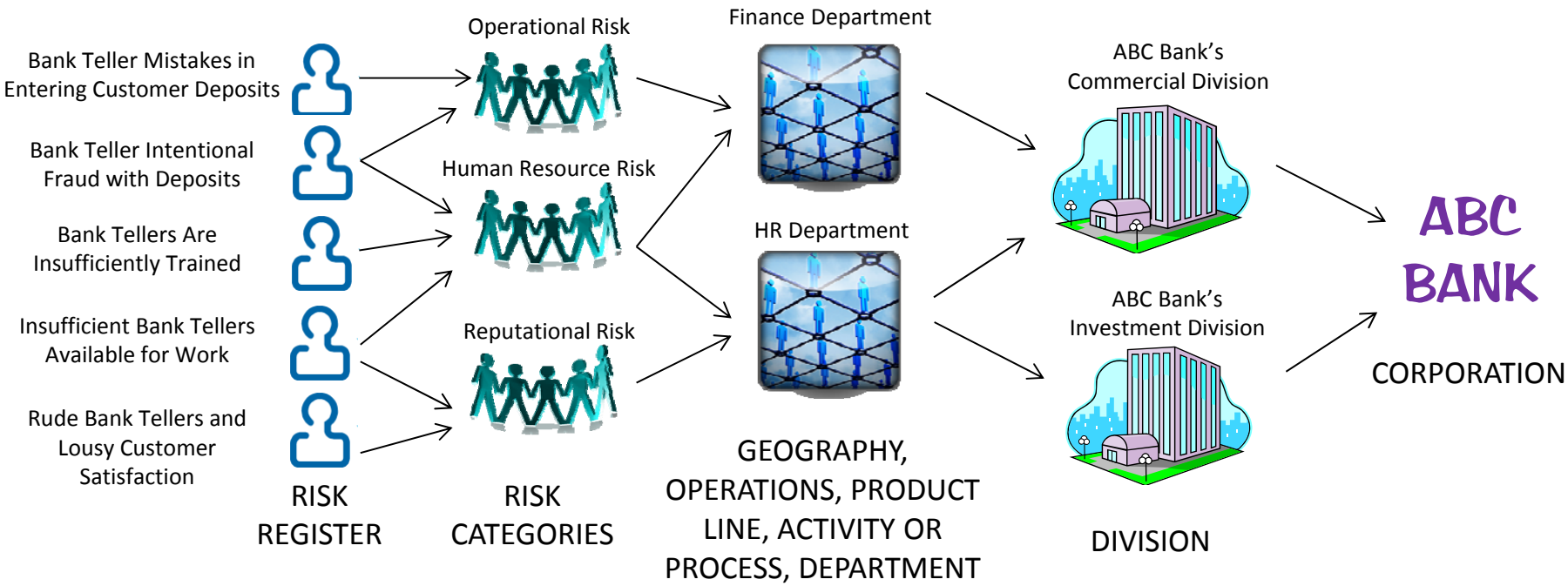
The Risk Register segment includes risk items that users enter (information such as the name of the risk, short descriptions, who is in charge, risk mitigation techniques, date entered, required resolution date, etc.) and links to the relevant Risk Categories. Below is a simple example illustration. The Web module handles data collection from multiple users logged in and extracts to an Excel file. Our PEAT-based Desktop module will take care of everything else. As additional explanation and overview, this module is used to capture and model QUALITATIVE risks (e.g., how many thefts a year, chances of a fire at the power plant, etc.) and each risk item or element is given a number (1–5 integer scale or 1–10 integer scale, with 1 being LOW and 10 or 5 being HIGH) for Likelihood (chances it will occur) and Impact (financial, operational, economic, human resource cost). Likelihood x Impact = Key Risk Indicator (KRI). KRI is, therefore, 1–25 or 1–100 depending on which scale the user chooses to use.



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Risk KRI: Global Settings of Risk Categories (1-5 or 1-10) with Customizable Color Coding of KRI

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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Welcome to the ROV Project Economics Analysis Tool (PEAT). This tool will help you set up a series of projects or capital investment options, model their cash flows, simulate their risks, and run advanced analytics, perform forecasting and prediction modeling, and optimize your investment portfolio subject to budgetary and other constraints.

ERM | Applied Analytics | Risk Simulation | Knowledge Center

Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

Global Settings | Risk Groups | Risk Mapping

1. Date Settings:
- (●) MM/DD/YYYY
- ( ) DD/MM/YYYY

2. Range for Likelihood and Impact:
- (●) 1 (low) - 10 (high)
- ( ) 1 (low) - 5 (high)

3. Color Coding for Key Risk Indicators (Likelihood x Impact):
- (●) 5 Color Categories
- ( ) 3 Color Categories

Customize...

Risk Impact										
	10	20	30	40	50	60	70	80	90	100
	9	18	27	36	45	54	63	72	81	90
	8	16	24	32	40	48	56	64	72	80
	7	14	21	28	35	42	49	56	63	70
	6	12	18	24	30	36	42	48	54	60
	5	10	15	20	25	30	35	40	45	50
	4	8	12	16	20	24	28	32	36	40
	3	6	9	12	15	18	21	24	27	30
	2	4	6	8	10	12	14	16	18	20
	1	2	3	4	5	6	7	8	9	10
					Risk Likelihood					

- Low Risk
- Moderate Risk
- Significant Risk
- Very High Risk
- Critical Risk

4. Risk Appetite E-mail Alerts (Available in Online Version Only):
- (●) Send e-mail alerts
- ( ) Turn off e-mail alerts

E-mails will be auto-generated and sent to Risk Managers responsible for a risk element when Key Risk Indicators exceed the Risk Appetite score of: 54

or when due date is within: 123 days.

Send e-mail copies to: smith@example.com

(separate e-mails with semicolons)

5. Import Data from Excel: Import

6. Export Database:
- ( ) Entire Database
- (●) Risk Groups Only
- ( ) Risk Groups with Mapping Only
- ( ) Risk Bid Management Only

Export

Global Settings allows customization of Risk Categories (1-5 or 1-10) with Customizable Color Coding of KRI, etc.

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Risk Divisions, Risk G.O.P.A.D., Risk Categories, and Risk Managers

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Global Settings | Risk Groups | Risk Mapping

Choose the risk level/hierarchy you would like to either manually add and edit individual items or copy/paste multiple entries at once in the data grid below. You should start by adding Divisions followed by G.O.P.A.D., then Risk Category and Risk Manager. Select the risk level to manage, then add a new or edit/search for an existing entry.

DIVISION
Division Name:
Acronym:
Location:
Notes:

G.O.P.A.D.
Type: Products
Item Name: BRG 225 Retail Development i
Acronym: P-Croydon
Location: London, U.K.
Notes: Development of 225 retail units by the end of 2017

RISK CATEGORY
Risk Category Name: Competitive Risk
Acronym: Competition
Status: Active
Notes:
Load Risk Inventory Library

RISK MANAGER
Risk Manager Name:
Acronym:
Title/Position:
Department:
Direct Dial:
E-mail:
Location:
Notes:

Report | Save As New | Save Edits | Delete

Edit	Name	Acronym	Notes	Status	Create Date
	Client Risk	Client		Active	3/13/2014
	Competitive Risk	Competition		Active	3/13/2014
	Compliance Risk	Compliance		Active	3/13/2014
	Concentration Risk	Concentration		Active	3/13/2014
	Cost Risk	Cost		Active	3/13/2014
	Credit Risk	Credit		Active	3/13/2014
	Cultural Risk	Cultural		Active	3/13/2014
	Economic Risk	Economy		Active	3/13/2014
	Financial Risk	Financial		Active	3/13/2014
	Foreign Exchange Risk	Forex		Active	3/13/2014
	Human Resource Risk	Human		Active	3/13/2014

Creation of multiple Divisions within the Company allows the company can manage multiple risk profiles for each division. Creation and assignment of G.O.P.A.D. categories (geographic, operations, products, activity or process, and department) provides the ability to slice-and-dice the company's risk profile from multiple points of view, select from and create queries of specific G.O.P.A.D. to analyze, etc. Customized Risk Categories or use our library of predefined risk categories. Creation of persons in charge of certain risks, complete with contact information

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Risk Mapping: Creation and Linking of Risk Categories to one or more G.O.P.A.D.s and on to one or more Divisions.

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

Global Settings | Risk Groups | Risk Mapping

Based on previously created Risk Categories, G.O.P.A.D., and Divisions, you can now map and link these hierarchies. Each Risk Category can be mapped to one or more G.O.P.A.D. and Divisions. Hold down CTRL key to select multiple items.

Select One or More:

Category
- [ ] Client Risk
- [ ] Competitive Risk
- [ ] Compliance Risk
- [ ] Concentration Risk
- [x] Cost Risk
- [ ] Credit Risk
- [ ] Cultural Risk
- [ ] Economic Risk
- [ ] Financial Risk
- [ ] Foreign Exchange Risk
- [ ] Human Resource Risk

Select One or More:

GOPAD
- [ ] P-Croydon
- [ ] P-Dublin
- [ ] P-Saudi
- [x] D-Risk
- [ ] D-Finance
- [ ] D-Operations
- [ ] D-IT
- [ ] D-Legal

Select One or More:

Division
- [ ] Europe
- [ ] ME
- [x] USA

Report | Add New Connection | Save Edited Changes | Delete Connection

Edit	Risk Category	GOPAD Assignment	Division Assignment	Status
	Client Risk	P-Croydon	Europe	Active
	Competitive Risk	P-Dublin	USA	Active
	Cost Risk	D-Finance	USA	Active
	Cost Risk	D-Risk	USA	Active
	Cost Risk	P-Dublin	USA	Active
	Economic Risk	P-Saudi	ME	Active
	Financial Risk	D-Finance	USA	Active
	Human Resource Risk	P-Saudi	ME	Active
	Inflation Rate Risk	P-Saudi	ME	Active
	IT Risk	D-IT	USA	Active
	Legal Risk	P-Croydon	Europe	Active
	Operational Risk	P-Croydon	Europe	Active

This allows the analyst the ability to view how a certain risk permeates through the organization as well as how a specific risk element may touch multiple departments, divisions, processes, and so forth.

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Risk Registers: Creation of Multiple Risk Registers

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

Risk Element Name: Rework, scope creep, continual enh

Acronym/Short Name: Rework

Causes of Risk: Client keeps changing the specifications

Consequences of Risk: Rework, scope creep, and requirements keep changing over time

Risk Mitigation Response: Contract needs to specify deadline for specifications freeze

Action Plan (Doc): Browse...

Status: Active | Assigned To: JJSmith | Select Risk Category: Client

Required Inputs

	Total (Gross)	Current (Net)
Likelihood of Occurrence (L):	4	3
Possible Financial Impact (I):	5	3
% Risk Mitigation Currently Completed:	80.00 %	

Optional Inputs

	Min	Likely	Max
Total Risk Level ($):	$125,000	$155,000	$175,000
Residual Risk Level ($):	$55,000	$65,000	$80,000
Mitigation Cost ($):	$5,000	$7,000	$8,000

Key Risk Dates:	Created	Updated	Due Date
	3/14/2014	3/14/2014	5/14/2014

Name: Project DGS728 (FY 2014)

Save As | Edit | Save | Delete

Saved Risk Registers
- Project DGS728 (FY 2014)
- CEO Presentation to Board (Dec 2014)
- Project MMS5528 (FY 2014)

Create New | Delete | Save Edited | Report

		Risk Register	CAT	GOPAD	DIV	Create	Edit	Due	Total (Gross) L	Total (Gross) I	Total (Gross) KRI	Residual (Net) L	Residual (Net) I	Residual (Net) KRI	PIC	% OK	Status	Risk $	Left $	Cost $	Doc
1		Rework	Client	P-Croydon	Europe	3/14/2014	3/14/2014	5/14/2014	4	5	20	3	3	9	JJSmith	80%	Active	$155,000	$65,000	$7,000	
Cause:		Client keeps changing the specifications				Consequence:		Rework, scope creep, and requirements keep changing over time							Mitigation:	Contract needs to specify deadline for specifications freeze					
2		Multiple Bids	Competition	P-Dublin	USA	3/14/2014	3/14/2014	5/14/2014	8	8	64	5	6	30	JCannon	0%	Active	$325,000	$195,000	$75,000	
Cause:		Multiple competitors are looking at this				Consequence:		Might lose the bid/project							Mitigation:	JCannon needs to find differentiation and price competitiveness to win					
3		Overrun	Cost	D-Finance	USA	3/14/2014	3/14/2014	5/14/2014	4	4	16	3	3	9	JJSmith	50%	Active	$1,000,000	$500,000	$50,000	
Cause:		Lack of raw materials and supplier delays				Consequence:		Additional wait time required							Mitigation:	Source multiple vendors and sign contracts with them at some extra cost					
4		Cost Basis	Cost	D-Finance	USA	3/14/2014	3/14/2014	5/14/2014	4	5	20	3	3	9	RRodgers	50%	Active	$350,000	$179,000	$35,000	
Cause:		Multiple competitors are looking at this				Consequence:		Might lose the bid/project							Mitigation:	JCannon needs to find value differentiation and price competitiveness					

We allow the creation of Multiple Risk Registers where each Risk Register has multiple Risk Elements consisting of Causes of Risk, Consequences of Risk, Risk Mitigation Response, Risk Manager Assignments, Risk Category, Risk Status, Likelihood, Impact, Key Risk Indicators (KRI), Risk Dates (Creation, Edit, and Due Dates), Total $ Risk Levels, Residual $ Risk Levels, Mitigation Cost, and so forth.

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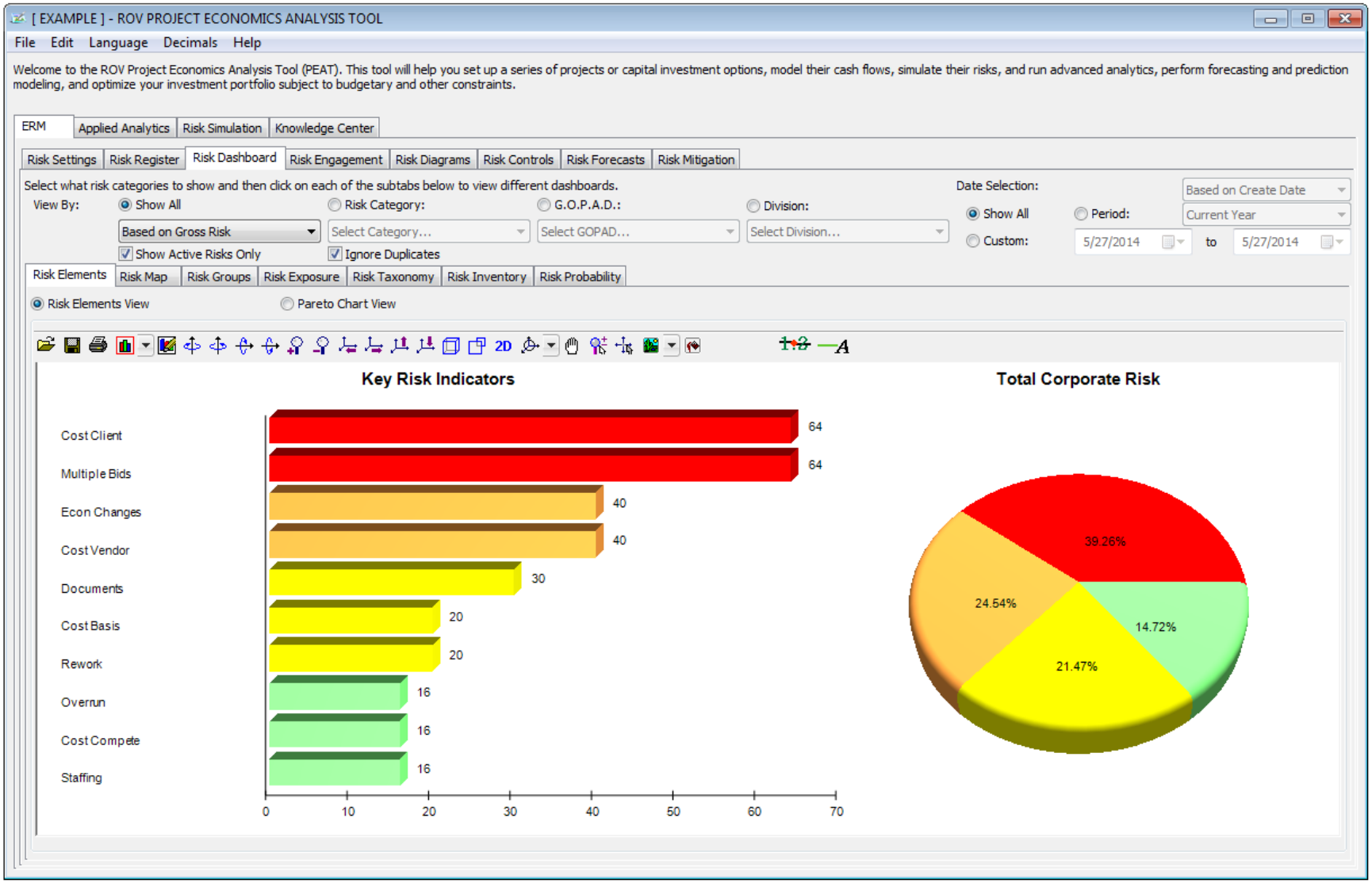
Risk Dashboards: Risk Elements (Viewing KRIs and Pareto Charts)



Creation of customized Risk Dashboard views complete with reports, data grids, charts, and visuals, where analysts can select from a specific G.O.P.A.D., Division, Risk Category, or Risk Dates.

Risk Dashboard: Risk Maps (Risk Heat Maps of KRI Counts)

Risk Heat Maps of 5 x 5 or 10 x 10 matrices can be automatically created with customizable risk heat zones.

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Risk Dashboard: Risk Groups (Risk Accumulation by G.O.P.A.D.)

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Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

Select what risk categories to show and then click on each of the subtabs below to view different dashboards.

View By: Show All | Risk Category: | G.O.P.A.D.: | Division:

Based on Gross Risk | Select Category... | Select GOPAD... | Select Division...

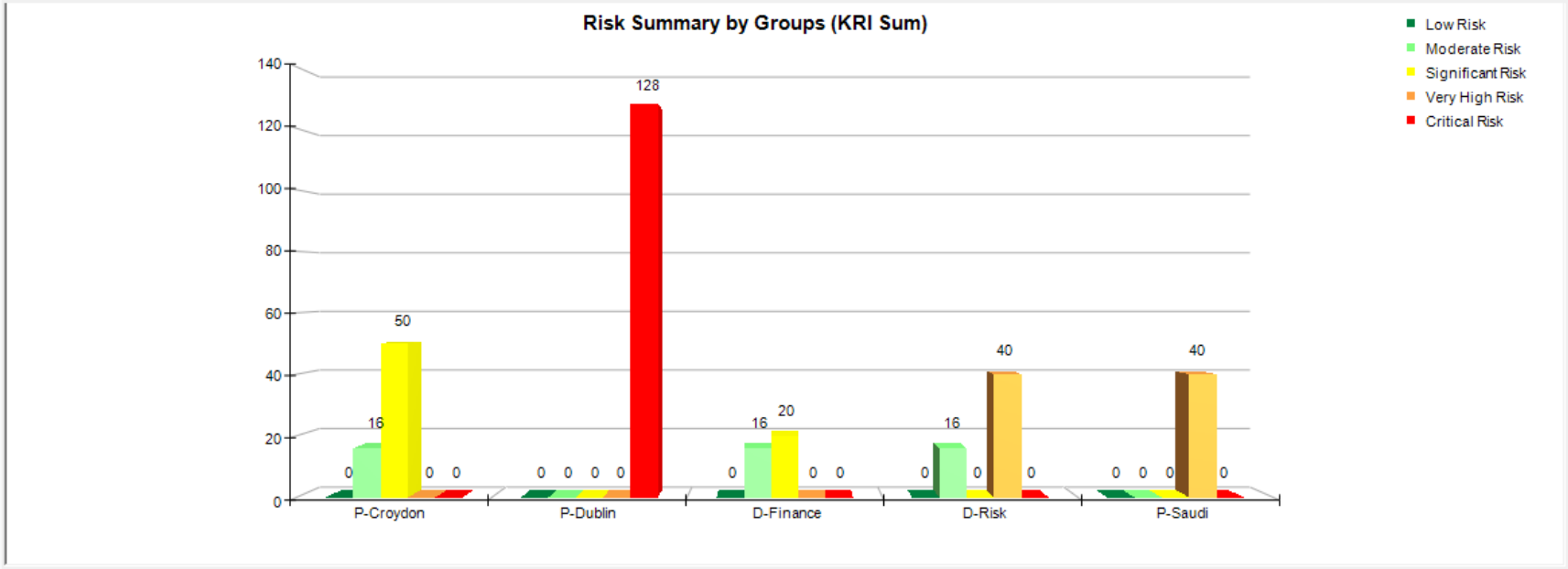
Show Active Risks Only | Ignore Duplicates

Date Selection: Show All | Period: | Custom:

Based on Create Date | Current Year | 5/27/2014 to 5/27/2014

Risk Elements | Risk Map | Risk Groups | Risk Exposure | Risk Taxonomy | Risk Inventory | Risk Probability

Key Risk Indicators Sum: | Show All Risk Categories | Risk Element Count



A bird's eye view of all G.O.P.A.D.s accumulated by KRI Sum and Risk Element Count within the active Risk Register

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Risk Dashboard: Risk Exposure (Selected Category versus the Company)

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Select what risk categories to show and then click on each of the subtabs below to view different dashboards.

View By: Show All | Risk Category: | G.O.P.A.D.: | Division:

Based on Gross Risk | Select Category... | Select GOPAD... | Select Division...

Show Active Risks Only | Ignore Duplicates

Date Selection: Show All | Period: Based on Create Date | Current Year | Custom: 5/27/2014 to 5/27/2014

Risk Elements | Risk Map | Risk Groups | Risk Exposure | Risk Taxonomy | Risk Inventory | Risk Probability

Total Exposure (Corporate)

$1,558,500

$779,250 $2,337,750

$0 $3,117,000

Residual Exposure (Corporate)

$958,200

$479,100 $1,437,300

$0 $1,916,400

Total Exposure (Corporate)

$1,558,500

$779,250 $2,337,750

$0 $3,117,000

Residual Exposure (Corporate)

$958,200

$479,100 $1,437,300

$0 $1,916,400

Total and Residual Risk Exposure (Selected Category and Corporate)

Total (Corporate) $2,484,055

Total (Corporate) $2,484,055

Residual (Corporate) $1,225,110

Residual (Corporate) $1,225,110

Total Exposure (Corporate): $2,484,055
Total Exposure (Corporate): $2,484,055
Percentage of Total Corporate: 100.00%

Residual Exposure (Corporate): $1,225,110
Residual Exposure (Corporate): $1,225,110
Percentage of Residual Corporate: 100.00%

Risk Exposure provides a visualization using risk dials and dashboards of the selected category versus the entire Company.

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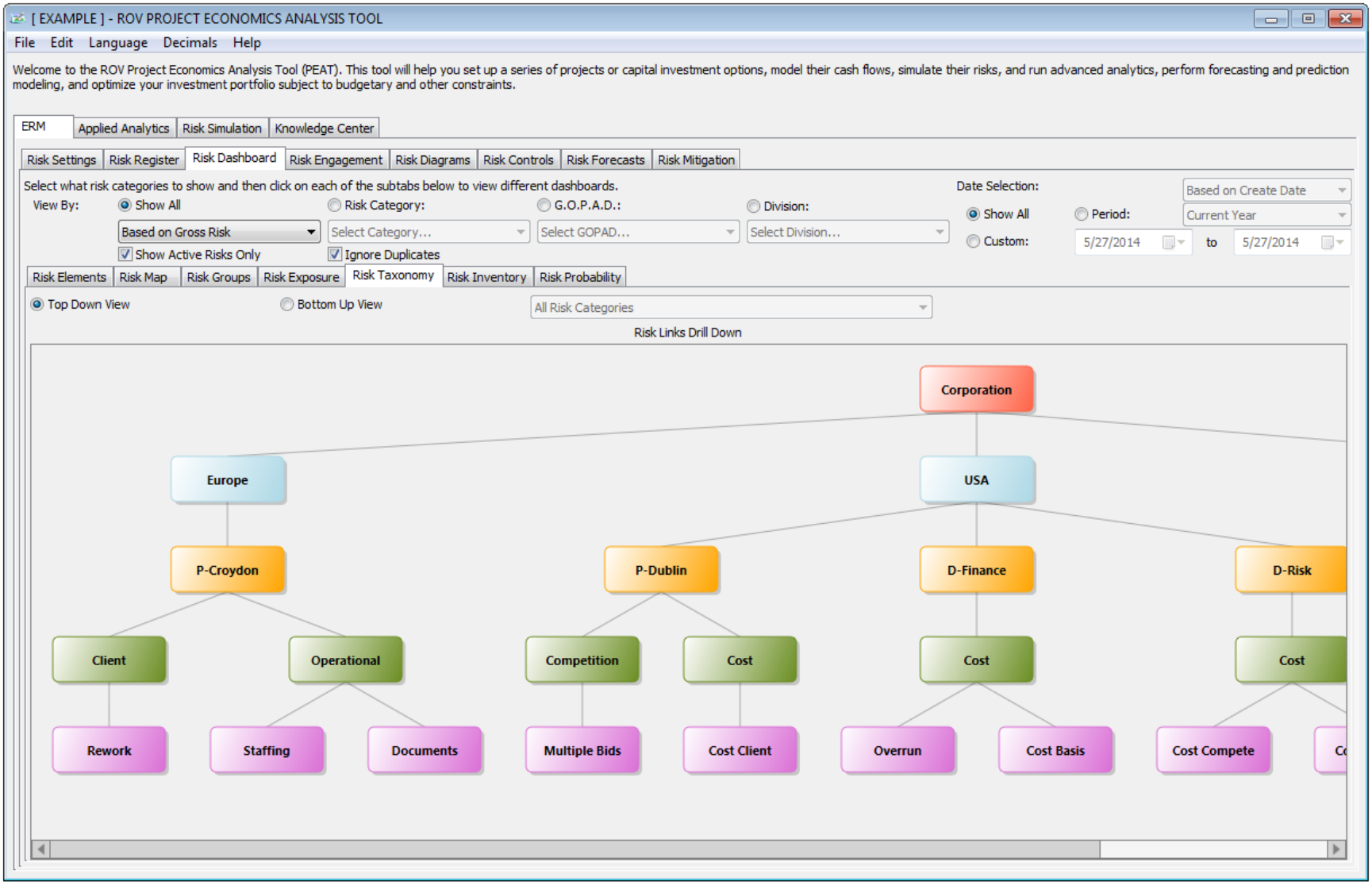
Risk Dashboard: Risk Taxonomy



Risk Taxonomy (top-down view to drill-down and see the structure of the corporation and its risk associations, versus a bottom-up view of how a specific risk permeates throughout the corporation)

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Risk Dashboard: Risk Inventory (SQL Queries)

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

File Edit Language Decimals Help

Welcome to the ROV Project Economics Analysis Tool (PEAT). This tool will help you set up a series of projects or capital investment options, model their cash flows, simulate their risks, and run advanced analytics, perform forecasting and prediction modeling, and optimize your investment portfolio subject to budgetary and other constraints.

ERM | Applied Analytics | Risk Simulation | Knowledge Center

Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

Select what risk categories to show and then click on each of the subtabs below to view different dashboards.

View By: Show All | Risk Category: | G.O.P.A.D.: | Division:

Based on Gross Risk | Select Category... | P-Croydon | Select Division...

Show Active Risks Only | Ignore Duplicates

Date Selection: Show All | Period: Based on Create Date | Current Year | Custom: 5/27/2014 to 5/27/2014

Risk Elements | Risk Map | Risk Groups | Risk Exposure | Risk Taxonomy | Risk Inventory | Risk Probability

		Risk Register	CAT	GOPAD	DIV	Create	Edit	Due	Total (Gross)			Residual (Net)			PIC	% OK	Status	Risk $	Left $	Cost $	Doc
									L	I	KRI	L	I	KRI							
1		Rework	Client	P-Croydon	Europe	3/14/2014	3/14/2014	5/14/2014	4	5	20	3	3	9	JJSmith	80%	Active	$155,000	$65,000	$7,000	
Cause:		Client keeps changing the specifications				Consequence:		Rework, scope creep, and requirements keep changing over time							Mitigation:	Contract needs to specify deadline for specifications freeze					
2		Staffing	Operational	P-Croydon	Europe	3/14/2014	3/14/2014	5/14/2014	4	4	16	3	3	9	SMinh	50%	Active	$89,000	$29,000	$2,500	
Cause:						Consequence:									Mitigation:						
3		Documents	Operational	P-Croydon	Europe	4/8/2014	4/8/2014	6/8/2014	5	6	30	5	3	15	SMinh	25%	Active	$100,000	$50,000	$50,000	
Cause:		Lack of documentation that covers local ordinances				Consequence:		Fines by local authorities							Mitigation:	Hire local attorneys to review specifications and documents					

Risk Inventory (running SQL queries to obtain the customized risk profiles and risk reports by Division, G.O.P.A.D., Risk Category, Risk Dates, and so forth)

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Risk Dashboard: Risk Probability (PDF, CDF, ICDF)

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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Select what risk categories to show and then click on each of the subtabs below to view different dashboards.

View By: Show All | Risk Category: | G.O.P.A.D.: | Division:

Based on Gross Risk | Select Category... | P-Croydon | Select Division...

Show Active Risks Only | Ignore Duplicates

Date Selection: Show All | Period: | Custom: 5/27/2014 to 5/27/2014 | Based on Create Date | Current Year

Risk Elements | Risk Map | Risk Groups | Risk Exposure | Risk Taxonomy | Risk Inventory | Risk Probability

Binomial, Normal, Poisson, Triangular, Arcsine, Bernoulli, Beta, Beta 3, Beta 4, Cauchy, Chi-Square, Cosine, Discrete Uniform, Double Log, Erlang, Exponential

Enter the required distributional parameters:

Lambda 1.25

Enter the required table properties:

Starting X Value: 0

Ending X Value: 8

Step Size: 1

Show: 4 decimals

RUN

X Value	PROB	CUM.
0.0000	28.6505%	28.6505%
1.0000	64.4636%	64.4636%
2.0000	86.8468%	86.8468%
3.0000	96.1731%	96.1731%
4.0000	99.0876%	99.0876%
5.0000	99.8162%	99.8162%
6.0000	99.9680%	99.9680%
7.0000	99.9951%	99.9951%
8.0000	99.9993%	99.9993%

Percentile	X Value
0.0000%	0.0000
10.0000%	0.0000
20.0000%	0.0000
30.0000%	1.0000
40.0000%	1.0000
50.0000%	1.0000
60.0000%	1.0000
70.0000%	2.0000
80.0000%	2.0000
90.0000%	3.0000
100.0000%	12.0000

Poisson Distribution

The Poisson distribution describes the number of times an event occurs in a given interval, such as the number of telephone calls per minute or the number of errors per page in a document. The number of possible occurrences in any interval is unlimited, the occurrences are independent. The number of occurrences in one interval does not affect the number of occurrences in other intervals, and the average number of occurrences must remain the same from interval to interval. Rate or Lambda is the only distributional parameter.

Input requirements:

Rate > 0 and ≤ 1000

Risk Probability (computing PDF and CDF of the probability of a discrete risk event occurring or continuous risk amounts based on historical experience)

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Risk Engagement: Pre-Engagement Risks

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

Pre-Engagement or Pre-Bid | Engagement or Bid Assessment | Lessons Learned

Project Name: Project Saturn: Residential Housing Developm

Project ID #: RH-563162

Updated: 3/11/2014

Name: Project Synecor 2015

Notes: Development of 1000 residential units in the outskirts of Crydon, London, anticipated bid

Save As | Save | Edit | Delete

Engagement: John Smith; Project Synecor 2015

Custom Categories | Copy | Report | Show: 30 rows | Risk Library

ITEM	CATEGORIES	EXPLANATIONS & DETAILS	DATA SOURCE	RISK CRITERIA			NOTES
				Low Risk	Significant Risk	Critical Risk	
Client Profile	Experience dealing with client (integrity, ontime payment, frequent	We have dealt with the client before in the past and they are very picky on technical details and keep changing	Past Experience		Manageable risk if our contracts are air tight on scope creeps		
Partnerships	Potential partners and subcontractors available to reduce project risk	We can mitigate any technical risks with our pool of partners		We have a pool of existing partners			
Project Profile	Insufficient information on bid order, RFP has limited details, future	RFP has some technical issues missing such as who will implement the architectural changes to plots C-DE	RFP		We can state this in the contract that client's responsibility		
Competitors	Key competitors for the project	HHSC and RMBH are two main competitors in the bid that we foresee	Competitive Database	We can significantly outprice them			
Financial Profitability	Potential for financial losses if resource, cost, and schedule risks are not	Lowered pricing will cause profits to shrink and if overrun happens, we may make losses on early phases	Pricing Model			Pricing is a significant risk	
Internal Capabilities	Potential lack of expertise and experience in executing and						
Contractual Obligations	Potential complex contract negotiations and loopholes						
Cost Risk	Potential for cost and budget overruns from human resources and raw						

This section allows the creation of multiple Risk Engagement projects where each saved project has multiple Risk Elements

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Risk Engagement: Engagement Risks

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

Pre-Engagement or Pre-Bid | Engagement or Bid Assessment | Lessons Learned

Project Name: Project Mars: Residential Housing Developme

Project ID #: RH-613356

Updated: 3/11/2014

Custom Categories | Copy | Report

Name: Jacklyn Turner

Notes: Development of 2500 residential units in the outskirts of Leicester, London, completion was

Show: 20 rows

Save As | Save | Edit | Delete

Engagement
- Jacklyn Turner
- Corporate Project 163

ITEM	RISK ISSUES, EVENTS, CONCERNS	POTENTIAL IMPACT DETAILS	RELEVANT?	RISK CRITERIA			PROPOSED ACTIONS
				L	I	KRI	
Business Develop...	Increase of strong competitors in the area	Aggressive pricing impacts and lowering our opportunity for a viable financial strategy	YES	3	5	15	
Technical Work	Insufficient technical knowledge	Need to hire three additional technical draftsmen to determine the final specifications (RFP items XI-XIV)	YES	3	2	6	

Variable categories (columns) can be customized to include or exclude certain categorical items

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Risk Engagement: Lessons Learned (Post-Engagement)

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Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

Pre-Engagement or Pre-Bid | Engagement or Bid Assessment | Lessons Learned

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Custom Categories | Copy | Report

Name: Jacklyn Turner

Notes: Development of 2500 residential units in the outskirts of Leicester, London, completion was

Show: 20 rows

Save As | Save | Edit | Delete

Engagement

Jacklyn Turner

ITEM	CATEGORIES	ISSUES (WHAT)	CAUSE (WHY)	IMPACT (CONSEQUENCES)	ACTIONS TAKEN & RECOMMENDATIONS	IMPACT AREAS	NOTES
Project Management	Technical staff required	Need project managers who are more technical or have a technical	Schedule overruns was in part due to bad project management	Cost and budget overruns causing losses	Hire and train better PMs	Operations and PM	
Cost Analysis	Cost analysts required	Cost calculations are high level estimates and were highly inaccurate	Cost overruns was in part due to bad forecasting of costs	Cost and budget overruns causing losses	Risk Simulation with Monte Carlo cost risk models are required	PM and Cost Anlaysis	
Schedule Modeling	Senior management oversight	Schedule on bid was too optimistic	Schedule overruns was in part due to bad project management	Cost and budget overruns causing losses		PM and Cost Anlaysis	
Schedule Modeling	Technical training required	Schedule calculations are high level estimates and were highly inaccurate	Schedule delays were in part due to bad forecasting of time to	Cost and budget overruns causing losses	Risk Simulation with Monte Carlo schedule risk models are required	PM and Cost Anlaysis	

Maintain a library of lessons learned from past projects (good and bad)

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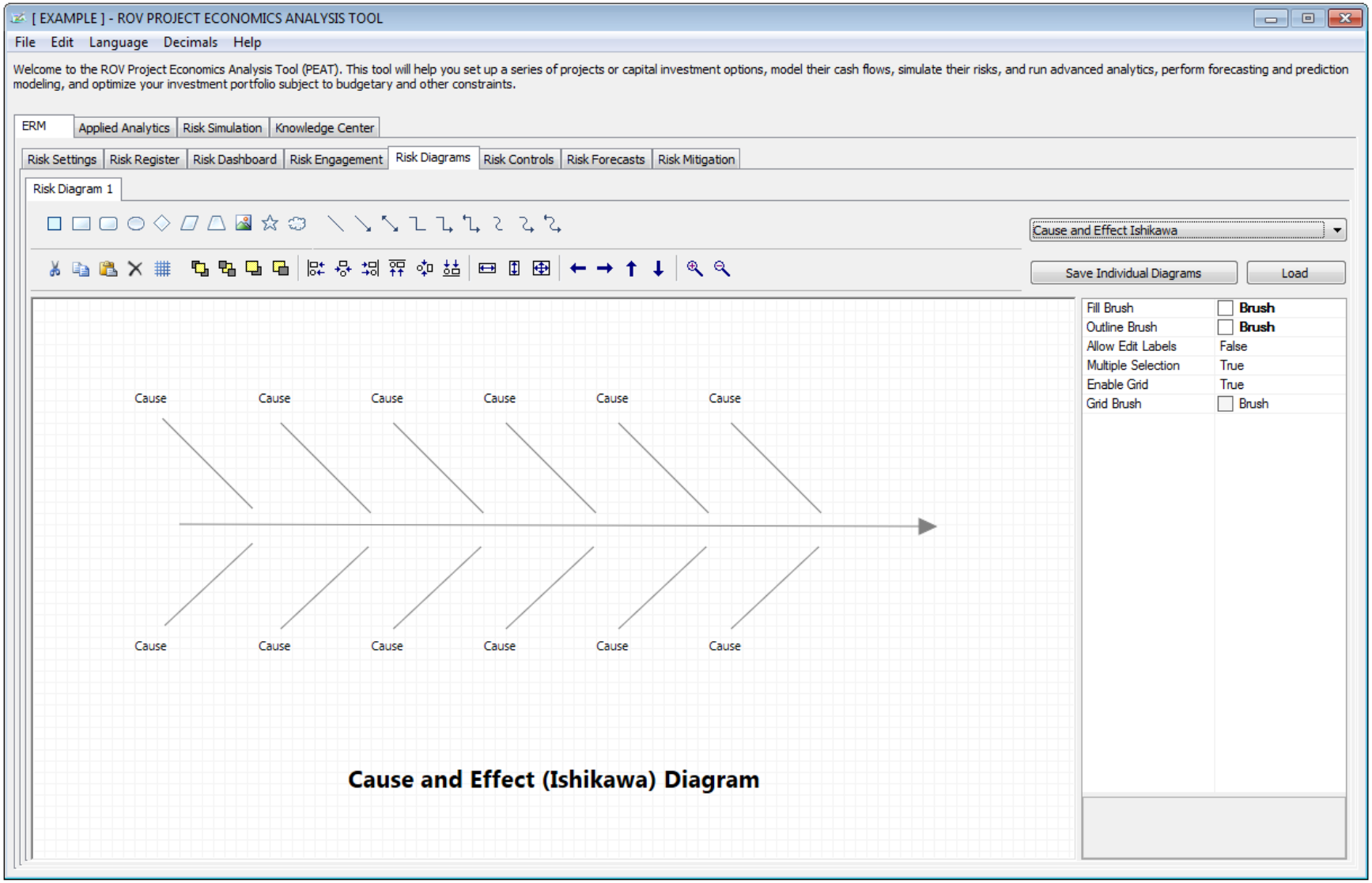
Risk Diagrams



Custom creation of your own Risk Diagrams with ready-made templates on Bowtie Hazard Diagrams, Cause and Effect Ishikawa Fishbone Diagrams, Drill Down Diagrams, Influence Diagrams, Mind Maps, and Node Diagrams. Users can create multiple custom risk diagrams using this tool.

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Risk Control

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

	VAR1	VAR2	VAR3	VAR4
Name	M1	M2	X2	X4
1	138.899994	286.700012	185	79.6
2	139.399994	287.799988	600	1
3	139.699997	289.100006	372	32.3
4	139.699997	290.100006	142	45.1
5	140.699997	292.299988	432	190.8
6	141.199997	293.899994	290	31.8
7	141.699997	295.299988	346	678.4
8	141.899994	296.399994	328	340.8
9	141	296.5	354	239.6
10	140.5	296.600006	266	111.9
11	140.399994	297.200012	320	172.5
12	140	297.799988	197	12.2
13	140	298.299988	266	205.6
14	139.899994	298.5	173	154.6
15	139.800003	299.200012	190	49.7
16	139.600006	300.100006	239	30.3
17	139.600006	301	190	92.8
18	139.600006	302.200012	241	96.9
19	140.199997	304.200012	189	39.8
20	141.300003	306.799988	358	489.2
21	141.199997	308.200012	315	767.6
22	140.899994	309.600006	303	163.6
23	140.899994	311	228	55
24	140.699997	312.299988	134	54.9

Analysis
- Control Chart: C
- Control Chart: NP
- Control Chart: P
- Control Chart: R
- Control Chart: U
- Control Chart: X
- Control Chart: XMR
- Charts: 2D Area
- Charts: 2D Bar
- Charts: 2D Line

Var7;Var8

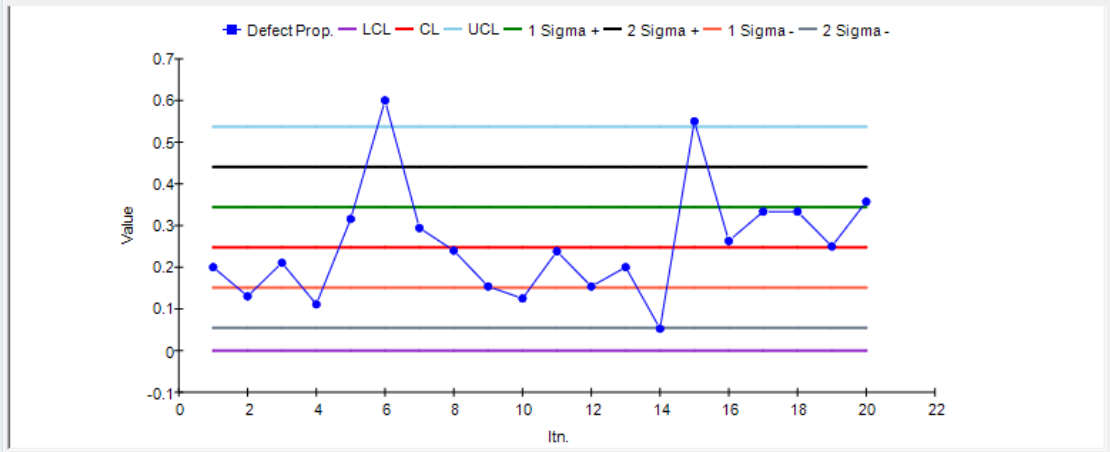
Data:
> Var1; Var2

Name: Control Chart P

Save As | Save | Edit | Delete

Model
- Chart 3D Line
- Chart 3D Pareto
- Chart 3D Point
- Chart 3D Scatter
- Chart QQ Normal
- Control Chart C
- Control Chart NP
- Control Chart P
- Control Chart R

Load Example | Clear Data | Run | Grid | Copy Chart



Determine if a specific risk event is in-control or out-of-control… For instance, if the number of risk events such as a plant accident spikes within a certain time period, was that set of events considered expected under statistically normal circumstances or an outlier requiring more detailed analysis?

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Risk Forecast

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Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

	VAR1	VAR2	VAR3	VAR4
Name	Historical	Y	X1	X2
1	684.2	521	18308	185
2	584.1	367	1148	600
3	765.4	443	18068	372
4	892.3	365	7729	142
5	885.4	614	100484	432
6	677	385	16728	290
7	1006.6	286	14630	346
8	1122.1	397	4008	328
9	1163.4	764	38927	354
10	993.2	427	22322	266
11	1312.5	153	3711	320
12	1545.3	231	3136	197
13	1596.2	524	50508	266
14	1260.4	328	28886	173
15	1735.2	240	16996	190
16	2029.7	286	13035	239
17	2107.8	285	12973	190
18	1650.3	569	16309	241
19	2304.4	96	5227	189
20	2639.4	498	19235	358
21		481	44487	315
22		468	44213	303
23		177	23619	228
24		198	9106	134

Forecast

- Stepwise Regression (Backward)
- Stepwise Regression (Correlation)
- Stepwise Regression (Forward)
- Stepwise Regression (Forward-Backward)
- Multiple Regression (Linear)
- Multiple Regression (Nonlinear)
- Time-Series Analysis (Auto)
- Time-Series Analysis (Double Exponential Smoothi...
- Time-Series Analysis (Double Moving Average)
- Time-Series Analysis (Double Moving Average Lag)
- Time-Series Analysis (Holt-Winter's Additive)
- Time-Series Analysis (Holt-Winter's Multiplicative)
- Time-Series Analysis (Seasonal Additive)
- Time-Series Analysis (Seasonal Multiplicative)
- Time-Series Analysis (Single Exponential Smoothing)

Var1
4
8

Data, Seasonality(Periods/Cycle), Forecast Periods, Alpha(Optional:0-1 else optimized), Beta(Optional:0-1 else optimized), Gamma(Optional:0-1 else optimized):
> Var1
> 4
> 3
> 2
> 2
> 2

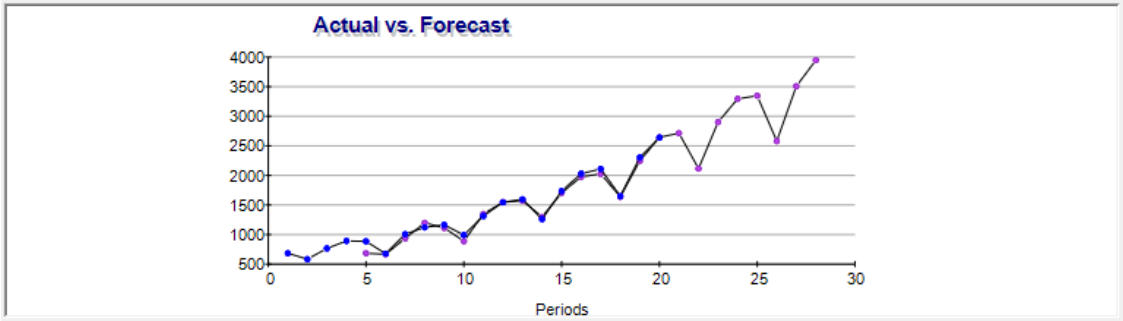
Save As | Save | Edit | Delete

Name: TS Analysis Auto

Model
- TS Analysis Auto
- TS Analysis DES
- TS Analysis DMA
- TS Analysis DMA Lag
- TS Analysis HWA
- TS Analysis HWM
- TS Analysis SA
- TS Analysis SM
- TS Analysis SES
- TS Analysis SMA
- Trend Line Diff Detrended
- Trend Line Exp Detrended

Load Example | Clear Data | Run | Grid | Copy Chart

Chart | Statistics



Using historical risk data, analysts can now apply predictive modeling to forecast future states of risk

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Risk Mitigation

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

Risk Settings | Risk Register | Risk Dashboard | Risk Engagement | Risk Diagrams | Risk Controls | Risk Forecasts | Risk Mitigation

	VAR1	VAR2	VAR3	VAR4
Name	DATA1	DATA2	DATA3	DATA4
1	10	10	10	10
2	43	13	17	14
3	14	3	14	14
4	15	15	12	15
5	18	32	18	18
6	19	24	19	32
7	19	55	19	19
8	21	3	21	21
9	22	3	22	22
10	21	22	21	21
11	26	23	26	26
12	28	28	28	28
13	29	56	29	29
14	30	30	30	30
15	33	33	33	22
16	32	37	44	53
17	39	75	39	39
18	44	44	44	44
19	44	44	44	44
20	46	46	46	46
21	48	48	21	48
22	55	55	55	55
23	57	57	57	57
24	66	66	66	66

Analysis

- Nonparametric: Friedman's Test
- Nonparametric: Kruskal-Wallis Test
- Parametric: 2 Variable (F) Variances
- Parametric: 2 Variable (T) Dependent Means
- Parametric: 2 Variable (T) Independent Equal Vari...
- Parametric: 2 Variable (T) Independent Unequal V...
- Parametric: 2 Variable (Z) Independent Means
- Parametric: 2 Variable (Z) Independent Proportions

Load Example | Clear Data

Var2;Var4
0
18
17

Data (=2), Hypothesized Mean, Column 1 Standard Deviation, Column 2 Standard Deviation:
> Var1; Var2
> 5
> 123.45
> 87.6

Name: Parametric: Two Variable Z Independent Means

Save As | Save | Edit | Delete

Model

- Parametric: Two Variable T Dependen...
- Parametric: Two Variable T Independ...
- Parametric: Two Variable T Independ...
- Parametric: Two Variable Z Independ...
- Parametric: Two Variable Z Independ...
- Parametric: Two Variable F Variances
- Nonparametric: Friedman's Test
- Nonparametric: Kruskal-Wallis Test

Run | Grid | Copy Results

Two Variable (Z) Independent Means
Column 1 Observations : 28
Column 1 Sample Mean : 37.428571
Column 1 Sample Standard Deviation : 20.810305
Column 2 Observations : 28
Column 2 Sample Mean : 35.678571
Column 2 Sample Standard Deviation : 17.234878
Z-Statistic : 0.374013
Hypothesized Mean : 0.000000

p-Value Left Tailed : 0.645803
not significant at any of the following significance levels: 1%, 5%, and 10%
not rejected
not significantly less than the hypothesized mean.

p-Value Right Tailed : 0.354197
not significant at any of the following significance levels: 1%, 5%, and 10%
not rejected
not significantly greater than the hypothesized mean.

p-Value Two Tailed : 0.708395
not significant at any of the following significance levels: 1%, 5%, and 10%
not rejected
not significantly different than the hypothesized mean.

Determine if a specific risk mitigation strategy or technique is working, at least statistically speaking… Collect data from before and after a risk mitigation strategy is implemented and determine if there is a statistically significant difference between the two..

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Risk Sensitivity: Tornado Analysis

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Static Tornado | Scenario Analysis

Tornado or static sensitivity analysis is performed by perturbing the inputs a preset amount one at a time to determine the impact on the output variable. Start by selecting the Option and Output Variable to test, then set the sensitivity levels and click Compute to run.

Select the Option and Output Variable to run:

Total Current Risk Level ($) | All Categories

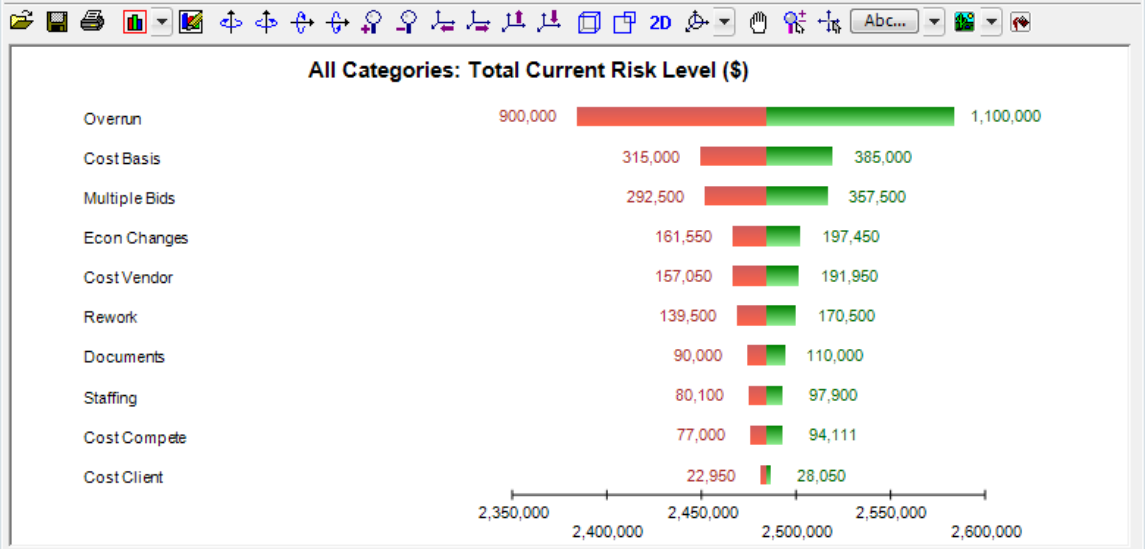
Sensitivity +/- 10 % Reset

Show the top 10 variables

Show results with 2 decimals

Please note that Tornado Analysis only runs the current or active Risk Register elements. To run Tornado Analysis on another saved Risk Register, please go back to ERM | Risk Register and open or edit another saved Risk Register.

Update | Excel | Copy Chart



The Tornado run has been completed.

☑			All Categories: Total Current Risk Level ($)	Base Value:	2,484,055.00			Input Changes	
Chart	% Up	% Down	Inputs	Output Downside	Output Upside	Effective Range	Input Downside	Input Upside	Base Case Value
☑	10.00%	10.00%	Overrun	2,384,055.00	2,584,055.00	200,000.00	900,000.00	1,100,000.00	1,000,000.00
☑	10.00%	10.00%	Cost Basis	2,449,055.00	2,519,055.00	70,000.00	315,000.00	385,000.00	350,000.00
☑	10.00%	10.00%	Multiple Bids	2,451,555.00	2,516,555.00	65,000.00	292,500.00	357,500.00	325,000.00
☑	10.00%	10.00%	Econ Changes	2,466,105.00	2,502,005.00	35,900.00	161,550.00	197,450.00	179,500.00
☑	10.00%	10.00%	Cost Vendor	2,466,605.00	2,501,505.00	34,900.00	157,050.00	191,950.00	174,500.00
☑	10.00%	10.00%	Rework	2,468,555.00	2,499,555.00	31,000.00	139,500.00	170,500.00	155,000.00

Identify the critical success factors or which risk element contributes the most to the bottom line risk profile of the company (or risk segment) by statically perturbing each of the risk element's financial risk levels

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Risk Scenarios: Multiple Scenario Analysis

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

Static Tornado | Scenario Analysis

1. Scenario Input Settings | 2. Scenario Output Tables ("Sweetspots")

Scenario Analysis helps identify the sweetspots and hotspots in the results based on different inputs. Select the Option and Output Variable you wish to analyze and from the list of input variables, select up to TWO variables to change (check the box and enter the From, To, Step Size). You can add color coding to identify potential sweetspots and hotspots, and save the scenario settings for future runs.

Please note that Scenario Analysis only runs the current or active Risk Register elements. To run Scenario Analysis on another saved Risk Register, please go back to ERM | Risk Register and open or edit another saved Risk Register.

Select Option and Output Variable:

Total Current Risk Level ($) | All Categories | 2,484,055.00

OPTIONAL: Color-coding "sweetspots" and "hotspots".

Color cell	if value is	less than	2,500,000.00	&	
Color cell	if value is	between	2,500,000.00	&	3,000,000.00
Color cell	if value is	greater than	3,000,000.00	&	
Color cell	if value is			&	
Color cell	if value is			&	

	Single Item	Original Value	From	To	Step Size
☑	Rework	155,000.00	100,000.00	250,000.00	10,000.00
☐	Multiple Bids	325,000.00			
☑	Overrun	1,000,000.00	800,000.00	1,650,000.00	50,000.00
☐	Cost Basis	350,000.00			
☐	Staffing	89,000.00			
☐	Cost Compete	85,555.00			
☐	Cost Vendor	174,500.00			
☐	Cost Client	25,500.00			
☐	Documents	100,000.00			
☐	Econ Changes	179,500.00			

SAVE:

Name: Sample Scenario 1

Notes:

Save As... | Edit | Save | Delete

Name
Sample Scenario 1
Sample Scenario 2
Sample Scenario 3

Create multiple risk scenarios of your current or total risk amounts of individual risk elements to determine the impact on the corporate risk profile and create scenario heat maps

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Risk Scenarios: Scenario Heat Maps

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

Static Tornado | Scenario Analysis

1. Scenario Input Settings | 2. Scenario Output Tables ("Sweetspots")

Select one of the saved scenarios to run the scenario table. In the event you make any changes in the inputs or settings, remember to click Update to manually update the scenario table.

Select the Saved Scenario to Compute: Sample Scenario 1 Update

Show results with 0 decimals Scenario table is for: All Categories

NOTE: The Row variable (down) is Rework and the Column variable (across) is Overrun

	800,000	850,000	900,000	950,000	1,000,000	1,050,000	1,100,000	1,150,000	1,200,000	1,250,000	1,300,000	1,350,000	1,400,000	1,450,000	1,500,000	1,550,000	1,600,000	1,650,000
100,000	2,229,055	2,279,055	2,329,055	2,379,055	2,429,055	2,479,055	2,529,055	2,579,055	2,629,055	2,679,055	2,729,055	2,779,055	2,829,055	2,879,055	2,929,055	2,979,055	3,029,055	3,079,055
110,000	2,239,055	2,289,055	2,339,055	2,389,055	2,439,055	2,489,055	2,539,055	2,589,055	2,639,055	2,689,055	2,739,055	2,789,055	2,839,055	2,889,055	2,939,055	2,989,055	3,039,055	3,089,055
120,000	2,249,055	2,299,055	2,349,055	2,399,055	2,449,055	2,499,055	2,549,055	2,599,055	2,649,055	2,699,055	2,749,055	2,799,055	2,849,055	2,899,055	2,949,055	2,999,055	3,049,055	3,099,055
130,000	2,259,055	2,309,055	2,359,055	2,409,055	2,459,055	2,509,055	2,559,055	2,609,055	2,659,055	2,709,055	2,759,055	2,809,055	2,859,055	2,909,055	2,959,055	3,009,055	3,059,055	3,109,055
140,000	2,269,055	2,319,055	2,369,055	2,419,055	2,469,055	2,519,055	2,569,055	2,619,055	2,669,055	2,719,055	2,769,055	2,819,055	2,869,055	2,919,055	2,969,055	3,019,055	3,069,055	3,119,055
150,000	2,279,055	2,329,055	2,379,055	2,429,055	2,479,055	2,529,055	2,579,055	2,629,055	2,679,055	2,729,055	2,779,055	2,829,055	2,879,055	2,929,055	2,979,055	3,029,055	3,079,055	3,129,055
160,000	2,289,055	2,339,055	2,389,055	2,439,055	2,489,055	2,539,055	2,589,055	2,639,055	2,689,055	2,739,055	2,789,055	2,839,055	2,889,055	2,939,055	2,989,055	3,039,055	3,089,055	3,139,055
170,000	2,299,055	2,349,055	2,399,055	2,449,055	2,499,055	2,549,055	2,599,055	2,649,055	2,699,055	2,749,055	2,799,055	2,849,055	2,899,055	2,949,055	2,999,055	3,049,055	3,099,055	3,149,055
180,000	2,309,055	2,359,055	2,409,055	2,459,055	2,509,055	2,559,055	2,609,055	2,659,055	2,709,055	2,759,055	2,809,055	2,859,055	2,909,055	2,959,055	3,009,055	3,059,055	3,109,055	3,159,055
190,000	2,319,055	2,369,055	2,419,055	2,469,055	2,519,055	2,569,055	2,619,055	2,669,055	2,719,055	2,769,055	2,819,055	2,869,055	2,919,055	2,969,055	3,019,055	3,069,055	3,119,055	3,169,055
200,000	2,329,055	2,379,055	2,429,055	2,479,055	2,529,055	2,579,055	2,629,055	2,679,055	2,729,055	2,779,055	2,829,055	2,879,055	2,929,055	2,979,055	3,029,055	3,079,055	3,129,055	3,179,055
210,000	2,339,055	2,389,055	2,439,055	2,489,055	2,539,055	2,589,055	2,639,055	2,689,055	2,739,055	2,789,055	2,839,055	2,889,055	2,939,055	2,989,055	3,039,055	3,089,055	3,139,055	3,189,055
220,000	2,349,055	2,399,055	2,449,055	2,499,055	2,549,055	2,599,055	2,649,055	2,699,055	2,749,055	2,799,055	2,849,055	2,899,055	2,949,055	2,999,055	3,049,055	3,099,055	3,149,055	3,199,055
230,000	2,359,055	2,409,055	2,459,055	2,509,055	2,559,055	2,609,055	2,659,055	2,709,055	2,759,055	2,809,055	2,859,055	2,909,055	2,959,055	3,009,055	3,059,055	3,109,055	3,159,055	3,209,055
240,000	2,369,055	2,419,055	2,469,055	2,519,055	2,569,055	2,619,055	2,669,055	2,719,055	2,769,055	2,819,055	2,869,055	2,919,055	2,969,055	3,019,055	3,069,055	3,119,055	3,169,055	3,219,055
250,000	2,379,055	2,429,055	2,479,055	2,529,055	2,579,055	2,629,055	2,679,055	2,729,055	2,779,055	2,829,055	2,879,055	2,929,055	2,979,055	3,029,055	3,079,055	3,129,055	3,179,055	3,229,055

Scenario heat maps help identify the impact of each risk element and its corresponding effect on the organization's risk profile

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Risk Simulation: Simulation Assumptions

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

Set Input Assumptions | Simulation Results | Overlay Results | Analysis of Alternatives | Dynamic Sensitivity

Simulating 0540 Trials (054% Complete)..

Select the Option to simulate and set the relevant distributional input assumptions. Then, run the simulation and review the results.

Step 1: Choose an Option to set input assumptions.

Name
- Project DGS728 (FY 2014)
- CEO Presentation to Board (Dec 2014)
- Project MMS5528 (FY 2014)

Step 3: Run Simulation. Simulation Options

- Simulate All Options At Once
- Simulate Selected Option Only

Simulation Trials 1,000

Apply Seed Value 123

Stop Simulation

Step 4: Save/Edit Simulation Models (Optional).

Name: Simulation of Project DGS728 (FY 2014)

Model
- Simulation of Project DGS728 (FY 2014)

Save As... | Edit | Save | Delete

Step 2: Click on the distributional icon to set your simulation assumption. You can turn an assumption on or off using the checkbox.

Variable	Single Point	Settings	Simulation Parameter Information
Rework: Current Risk Level	155,000.00		Triangular | Minimum: 125000.0000; Most Likely: 155000.0000; Maximum: 175000.0000
Rework: Residual Risk Level	65,000.00		Triangular | Minimum: 55000.0000; Most Likely: 65000.0000; Maximum: 80000.0000
Rework: Mitigation Cost	7,000.00		Triangular | Minimum: 5000.0000; Most Likely: 7000.0000; Maximum: 8000.0000
Multiple Bids: Current Risk Level	325,000.00		Triangular | Minimum: 250000.0000; Most Likely: 325000.0000; Maximum: 350000.0000
Multiple Bids: Residual Risk Level	195,000.00		Triangular | Minimum: 125000.0000; Most Likely: 195000.0000; Maximum: 250000.0000
Multiple Bids: Mitigation Cost	75,000.00		Triangular | Minimum: 50000.0000; Most Likely: 75000.0000; Maximum: 80000.0000
Overrun: Current Risk Level	1,000,000.00		Triangular | Minimum: 500000.0000; Most Likely: 1000000.0000; Maximum: 1500000....
Overrun: Residual Risk Level	500,000.00		Triangular | Minimum: 200000.0000; Most Likely: 500000.0000; Maximum: 1000000.0...
Overrun: Mitigation Cost	50,000.00		Triangular | Minimum: 20000.0000; Most Likely: 50000.0000; Maximum: 75000.0000
Cost Basis: Current Risk Level	350,000.00		Triangular | Minimum: 320000.0000; Most Likely: 350000.0000; Maximum: 375000.0000
Cost Basis: Residual Risk Level	179,000.00		Triangular | Minimum: 150000.0000; Most Likely: 179000.0000; Maximum: 210000.0000
Cost Basis: Mitigation Cost	35,000.00		Triangular | Minimum: 25000.0000; Most Likely: 35000.0000; Maximum: 40000.0000
Staffing: Current Risk Level	89,000.00		Triangular | Minimum: 79000.0000; Most Likely: 89000.0000; Maximum: 109000.0000
Staffing: Residual Risk Level	29,000.00		Triangular | Minimum: 25000.0000; Most Likely: 29000.0000; Maximum: 39000.0000
Staffing: Mitigation Cost	2,500.00		Triangular | Minimum: 1500.0000; Most Likely: 2500.0000; Maximum: 5000.0000
Cost Compete: Current Risk Level	85,555.00		Triangular | Minimum: 75555.0000; Most Likely: 85555.0000; Maximum: 90000.0000
Cost Compete: Residual Risk Level	35,555.00		Triangular | Minimum: 25000.0000; Most Likely: 35555.0000; Maximum: 45500.0000
Cost Compete: Mitigation Cost	6,500.00		Triangular | Minimum: 5000.0000; Most Likely: 6500.0000; Maximum: 7000.0000
Cost Vendor: Current Risk Level	174,500.00		Triangular | Minimum: 169000.0000; Most Likely: 174500.0000; Maximum: 189000.0000
Cost Vendor: Residual Risk Level	69,500.00		Triangular | Minimum: 55250.0000; Most Likely: 69500.0000; Maximum: 72900.0000
Cost Vendor: Mitigation Cost	29,000.00		Triangular | Minimum: 18000.0000; Most Likely: 29000.0000; Maximum: 38000.0000

Run Monte Carlo Risk Simulations on your risk elements thousands to hundreds of thousands of times to generate probabilistic distributions and quantitative risk profiles

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Risk Simulation: Simulation Results

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

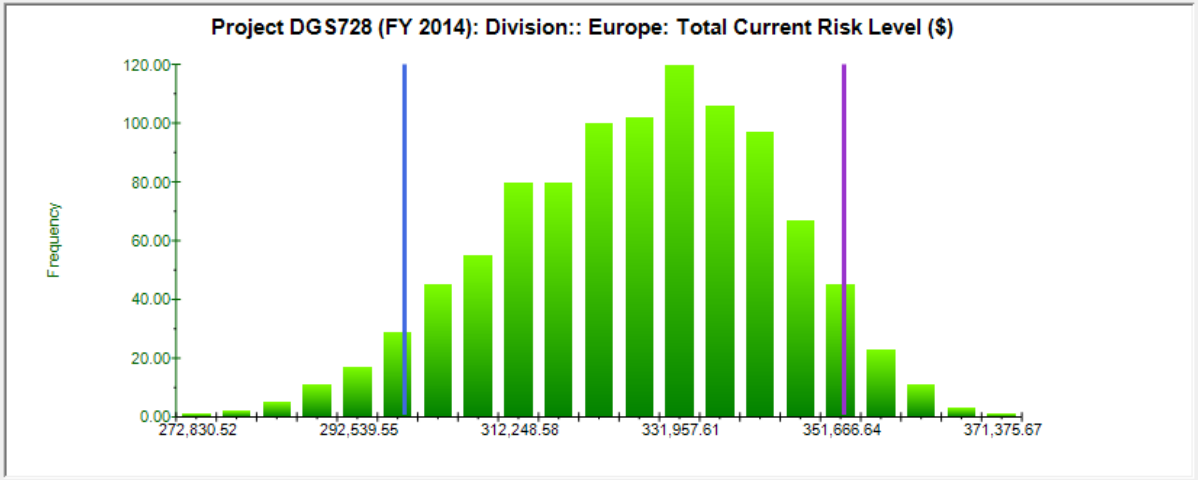
Set Input Assumptions | Simulation Results | Overlay Results | Analysis of Alternatives | Dynamic Sensitivity

The simulation run has been completed. Simulate Time: 9s.

Select the Option and Output Variable to view the results:

Project DGS728 (FY 2014): Division:: Europe: Total Current Risk Level ($)

Bar Type: Bar | Bar Color | Line Index: | Data Labels... | Custom Text Properties | S-Curve Color



Percentile	Value
0%	272,830.5194
5%	298,318.6369
10%	303,919.5874
20%	311,735.9746
30%	318,289.3292
40%	323,342.2748
50%	328,157.9192
60%	332,609.1326
70%	336,801.1548
80%	341,608.3867
90%	347,462.2976
95%	352,084.8208
100%	371,375.6742

Statistics	Value
Trials	1,000
Mean	326,835.5804
Median	328,157.9192
Stdev	16,768.7251
CV	5.1306%
Skew	-0.2825
Kurtosis	-0.3113
Minimum	272,830.5194
Maximum	371,375.6742
Range	98,545.1548

Show vertical lines at: PDF Histogram | Update

Compute and Show lines at: Two Tails

4 Decimals

Percentiles %:

Certainty Values:

Percentiles: 5 % 95 %

Value: 298,318.64 352,084.82

Copy Chart | Show Gridlines | Extract Simulation Data | Open | Save

Results from the Monte Carlo Risk Simulation run thousands to hundreds of thousands of times are presented as probability distributions and statistical moments, percentiles, and confidence intervals

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Risk Simulation: Overlay Results

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

Set Input Assumptions | Simulation Results | Overlay Results | Analysis of Alternatives | Dynamic Sensitivity

The simulation run has been completed. Simulate Time: 9s.

Select multiple Option and Output Variables to view the simulated probabilistic chart results side by side.

Name

- [x] Project DGS728 (FY 2014): Division:: Europe: Total Curre
- [ ] Project DGS728 (FY 2014): Division:: Europe: Total Resid
- [ ] Project DGS728 (FY 2014): Division:: Europe: Total Mitiga
- [ ] Project DGS728 (FY 2014): Division:: USA: Total Current F
- [ ] Project DGS728 (FY 2014): Division:: USA: Total Residual
- [x] Project DGS728 (FY 2014): Division:: USA: Total Mitigatior
- [ ] Project DGS728 (FY 2014): Division:: ME: Total Current Ri
- [ ] Project DGS728 (FY 2014): Division:: ME: Total Residual R
- [ ] Project DGS728 (FY 2014): Division:: ME: Total Mitigation
- [ ] Project DGS728 (FY 2014): GOPAD:: P-Croydon: Total Cu
- [ ] Project DGS728 (FY 2014): GOPAD:: P-Croydon: Total Re
- [ ] Project DGS728 (FY 2014): GOPAD:: P-Croydon: Total Mit
- [ ] Project DGS728 (FY 2014): GOPAD:: P-Dublin: Total Curre
- [ ] Project DGS728 (FY 2014): GOPAD:: P-Dublin: Total Resic
- [ ] Project DGS728 (FY 2014): GOPAD:: P-Dublin: Total Mitiga
- [ ] Project DGS728 (FY 2014): GOPAD:: D-Finance: Total Cur

PDF Curve Overlay

Selected S-Curve:

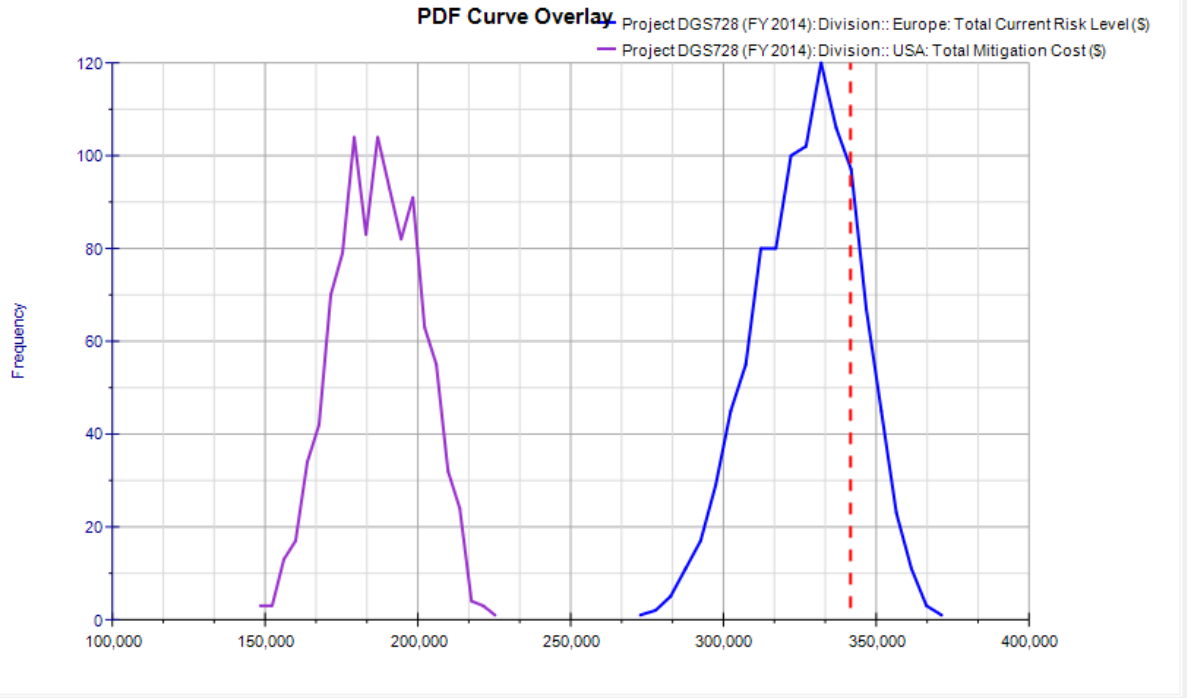
Project DGS728 (FY 2014): Division:: Europe: Total Current R

Percentiles %: 80.00

Certainty Values:

Update | Show Gridlines | Copy Chart

1 | S-Curve Color | Line Index: Project DGS728 (FY 2014): Division:: Europe: Total Current Risk Lev | Data Labels | Custom Text Properties



Overlay multiple risk profiles side by side to determine their respective impacts and uncertainty effects on the corporate risk profile

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Risk Simulation: Analysis of Alternatives

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

File Edit Language Decimals Help

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

Set Input Assumptions | Simulation Results | Overlay Results | Analysis of Alternatives | Dynamic Sensitivity

The simulation run has been completed. Simulate Time: 9s.

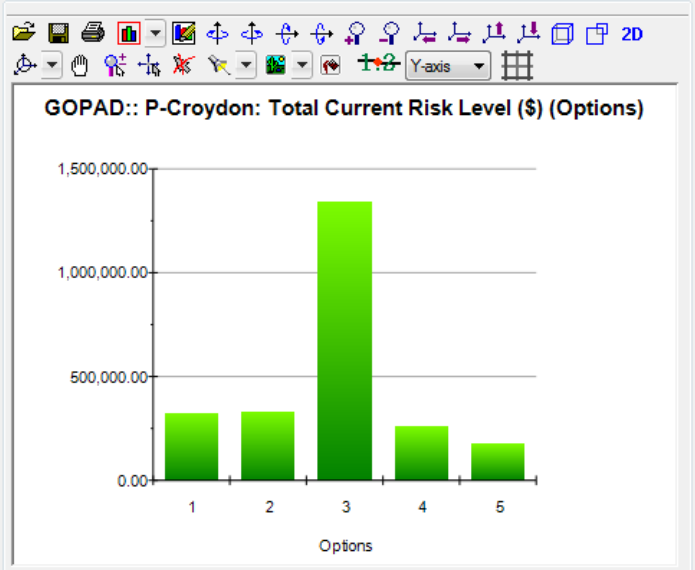
You can compare the dynamic simulated results of all your options. A simulation must first be run before you can obtain any results. Choose if you wish to compare all options as standalone (Analysis of Alternatives) or against a base case (Incremental Analysis).

ANALYSIS OF ALTERNATIVES AND BASE CASE INCREMENTAL ANALYSIS

Analysis of Alternatives (No Base Case) — Incremental Analysis (Choose Base Case): Project DGS728 (FY 2014)

Economic Results: GOPAD:: P-Croydon: Total Current Risk Level ($) — 2 Decimals

OPTIONS	Project DGS728 (FY 2014)	Project DGS728 (FY 2014)	Project DGS728 (FY 2014)	Project DGS728 (FY 2
Mean	326,835.58	333,843.56	1,342,004.39	261,264.19
Median	328,157.92	337,258.55	1,338,116.04	261,002.53
Stdev	16,768.73	21,261.52	201,328.62	5,172.50
Variance	2.81E+008	4.52E+008	4.05E+010	2.67E+007
CV	5.13%	6.37%	15.00%	1.98%
Skew	-0.2825	-0.4946	0.0257	0.1463
Kurtosis	-0.3113	-0.4687	-0.5834	-0.3831
Minimum	272,830.52	274,604.36	864,546.21	247,019.24
Maximum	371,375.67	373,319.06	1,829,282.15	276,000.63
Range	98,545.15	98,714.70	964,735.94	28,981.39
0% Percentile	272,830.52	274,604.36	864,546.21	247,019.24
5% Percentile	298,318.64	294,636.37	1,015,628.69	253,078.63
10% Percentile	303,919.59	302,957.89	1,070,675.19	254,332.91
20% Percentile	311,735.97	315,571.28	1,158,943.60	256,785.50
30% Percentile	318,289.33	322,572.91	1,230,344.82	258,413.94
40% Percentile	323,342.27	330,293.86	1,288,807.75	259,737.92
50% Percentile	328,157.92	337,258.55	1,338,116.04	261,002.53
60% Percentile	332,609.13	343,094.22	1,392,277.94	262,475.22
70% Percentile	336,801.15	347,748.99	1,450,825.63	263,995.87
80% Percentile	341,608.39	353,116.55	1,525,970.25	265,815.10
90% Percentile	347,462.30	359,397.49	1,618,796.25	268,290.77
95% Percentile	352,084.82	363,482.94	1,681,598.57	270,207.50
100% Percentile	371,375.67	373,319.06	1,829,282.15	276,000.63



2D Bar — Copy Chart

Compare the simulated results of various risk profiles

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Risk Simulation: Dynamic Sensitivity

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

Set Input Assumptions | Simulation Results | Overlay Results | Analysis of Alternatives | Dynamic Sensitivity

The simulation run has been completed. Simulate Time: 9s.

Dynamic Sensitivity is run by first performing a Monte Carlo Risk Simulation to model its dynamic interactions and impacts on the selected output variables. To get started, make sure you have a simulation already run, then choose the Option and Output Variable you wish to test and click Compute to run the analysis.

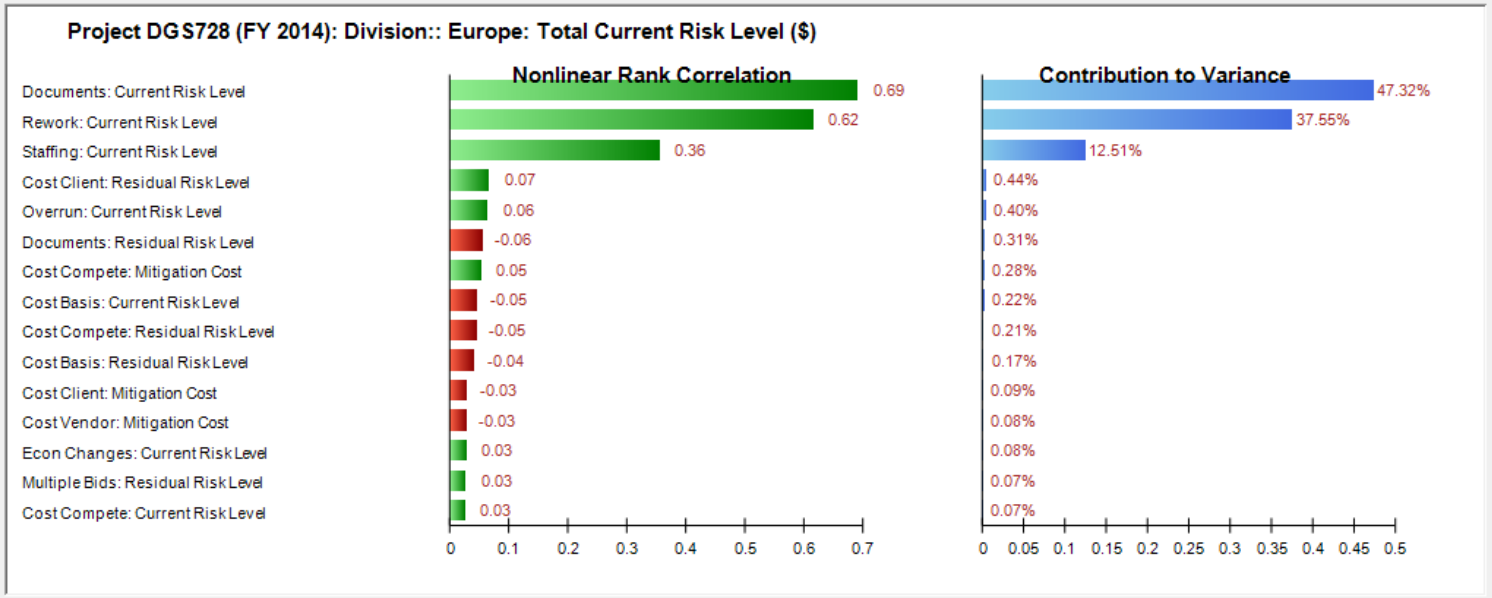
Select the Option and Output Variable to run:

Project DGS728 (FY 2014): Division:: Europe: Total Current Risk Level ($)

Show 15 Rows

Copy Charts

Abc...



Identify the contribution to variance and uncertainty of each risk element to the corporate, division or G.O.P.A.D. total as well as rank and identify the critical success factors or which risk element contributes the most to the bottom line risk profile when dynamically simulated

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Risk Reports

Risk Register Report 2014-05-27 12-28-28.xlsx - Microsoft Excel

B7 | Rework, scope creep, continual enhancement requests

Project MMS5528 (FY 2014)

	Risk Register Item	Acronym	Risk Category	G.O.P.A.D.	Division	Create Date	Edit Date	Due Date	Total Gross Risk			Residual Net Risk			Person in Charge	% OK	Status	Total Risk Level $	Residual Risk Level $	Mitigation Cost $	Cause	Consequence	Mitigation
									L	I	KRI	L	I	KRI									
1	Rework, scope creep, continual enhancement requests	Rework	Client	P-Croydon	Europe	3/14/2014	3/14/2014	5/14/2014	4	5	20	3	3	9	JJSmith	80%	Active	$0	$0	$0	Client keeps changing the specifications	Rework, scope creep, and requirements keep changing over time	Contract needs to specify deadline for specifications freeze
2	Multiple bids from main competitors like RHS and CCB	Multiple Bids	Competition	P-Dublin	USA	3/14/2014	3/14/2014	5/14/2014	8	8	64	5	6	30	JCannon	0%	Active	$0	$0	$0	Multiple competitors are looking at this	Might lose the bid/project	JCannon needs to find differentiation and price competitiveness to win
3	Cost overrun due to raw material delays and price hikes	Overrun	Cost	D-Finance	USA	3/14/2014	3/14/2014	5/14/2014	4	4	16	3	3	9	JJSmith	50%	Active	$1,000,000	$500,000	$50,000	Lack of raw materials and supplier delays	Additional wait time required	Source multiple vendors and sign contracts with them at some extra cost
4	Cost overrun due to raw material delays and price hikes	Overrun	Cost	D-Risk	USA	3/14/2014	3/14/2014	5/14/2014	4	4	16	3	3	9	JJSmith	50%	Active	$1,000,000	$500,000	$50,000	Lack of raw materials and supplier delays	Additional wait time required	Source multiple vendors and sign contracts with them at some extra cost
5	Cost overrun due to raw material delays and price hikes	Overrun	Cost	P-Dublin	USA	3/14/2014	3/14/2014	5/14/2014	4	4	16	3	3	9	JJSmith	50%	Active	$1,000,000	$500,000	$50,000	Lack of raw materials and supplier delays	Additional wait time required	Source multiple vendors and sign contracts with them at some extra cost
6	Cost pressures from competitors	Cost Compete	Cost	D-Finance	USA	3/14/2014	3/14/2014	5/14/2014	4	5	20	3	3	9	RRodgers	50%	Active	$0	$0	$0	Multiple competitors are looking at this	Might lose the bid/project	JCannon needs to find value differentiation and price competitiveness
7	Cost pressures from competitors	Cost Compete	Cost	D-Risk	USA	3/14/2014	3/14/2014	5/14/2014	4	5	20	3	3	9	RRodgers	50%	Active	$0	$0	$0	Multiple competitors are looking at this	Might lose the bid/project	JCannon needs to find value differentiation and price competitiveness
8	Cost pressures from competitors	Cost Compete	Cost	P-Dublin	USA	3/14/2014	3/14/2014	5/14/2014	4	5	20	3	3	9	RRodgers	50%	Active	$0	$0	$0	Multiple competitors are looking at this	Might lose the bid/project	JCannon needs to find value differentiation and price competitiveness
9	Missing critical subcontractors in the region	Staffing	Operational	P-Croydon	Europe	3/14/2014	3/14/2014	5/14/2014	4	4	16	3	3	9	SMinh	50%	Active	$0	$0	$0			
10	Cost pressures from competitors	Cost Compete	Cost	D-Finance	USA	3/14/2014	3/14/2014	5/14/2014	4	4	16	3	3	9	SMinh	50%	Active	$0	$0	$0	Multiple competitors are looking at this	Might lose the bid/project	JCannon needs to create price competitiveness to win
11	Cost pressures from competitors	Cost Compete	Cost	D-Risk	USA	3/14/2014	3/14/2014	5/14/2014	4	4	16	3	3	9	SMinh	50%	Active	$0	$0	$0	Multiple competitors are looking at this	Might lose the bid/project	JCannon needs to create price competitiveness to win
12	Cost pressures from competitors	Cost Compete	Cost	P-Dublin	USA	3/14/2014	3/14/2014	5/14/2014	4	4	16	3	3	9	SMinh	50%	Active	$0	$0	$0	Multiple competitors are looking at this	Might lose the bid/project	JCannon needs to create price competitiveness to win

Auto generating Reports and extraction to Excel capabilities.

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Risk Training: Knowledge Center – Step-by-Step Procedures

[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

File Edit Language Decimals Help

Welcome to the ROV Project Economics Analysis Tool (PEAT). This tool will help you set up a series of projects or capital investment options, model their cash flows, simulate their risks, and run advanced analytics, perform forecasting and prediction modeling, and optimize your investment portfolio subject to budgetary and other constraints.

ERM | Applied Analytics | Risk Simulation | Knowledge Center

Step-by-Step Procedures | Basic Project Economics Lessons | Getting Started Videos

<< Prev Step 01 of 28 Next >>

Welcome to ROV's Project Economics Analysis Tool (PEAT) Knowledge Center. Here you will find getting started guides and sample procedures that are straight to the point in assisting you to quickly get up to speed in using the software. Click on the PREVIOUS and NEXT buttons to navigate from slide to slide or to view the Getting Started Videos. Certain elements in the figures below are also highlighted in yellow to attract your attention to these key areas discussed in the slide. When you start PEAT, first select the Module you wish to run (e.g., Discounted Cash Flow Model or Oil or Gas Project Economics; additional Modules will be added in future releases), then select NEW (to start a new model from scratch), OPEN (open an existing model), or LOAD EXAMPLE to load an already completed example model (this latter choice is useful when trying to learn the functionalities of the software).

PEAT

Project Economics Analysis Tool

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Applying Integrated Risk Management methodologies (Monte Carlo risk simulation, strategic real options, stochastic forecasting, business analytics, and portfolio optimization) to project and portfolio economics and financial analysis.

- Corporate Investments - Stochastic DCF Analysis
- Corporate Investments - Buy vs. Lease
- Oil and Gas Economics - Investment Decision Analysis
- Oil and Gas Economics - Oil Field Reserves
- Project Management - Dynamic Schedule and Cost Analysis
- Public Sector Analysis - Knowledge Value Added
- ROV Compiled Models
- Customized Encrypted Models

Load Example | New | Open | Exit

Saudi Aramco – FPD Standard Economic Model | English

Saudi Aramco – FPD Standard Economic Model
Saudi Aramco – FPD Expanded Economic Model
Saudi Aramco – CFPD Standard Corporate Finance Projects
Saudi Aramco – JV Expanded Joint Venture Valuation
Saudi Aramco – Corporate Planning Portfolio Management
Northrop Grumman – IR&D Model
Northrop Grumman – S-Curve Analysis
Oil and Gas Economics – Remaining Oil Recovery Analysis
Oil and Gas Economics – Well Type Curves

All step-by-step procedures are customizable (text, slides, graphics, etc.) and can include high-level or detailed descriptions as desired. We can create custom lessons for your users or you can do it yourself!

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[EXAMPLE] - ROV PROJECT ECONOMICS ANALYSIS TOOL

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ERM | Applied Analytics | Risk Simulation | Knowledge Center

Step-by-Step Procedures | Basic Project Economics Lessons | Getting Started Videos

<< Prev Lesson 01 of 20 Next >>

Lesson 01. Welcome to the Basic Project Economic Lessons. In this series of slides, we cover the basics of project economics and key financial indicators, as well as interpretation of risk simulation results. Specifically, the Project Economics Analysis Tool (PEAT) computes various project economics and financial results including Net Present Value (NPV), Internal Rate of Return (IRR), Modified Internal Rate of Return (MIRR), Profitability Index (PI), Return on Investment (ROI), Payback Period (PP), and Discounted Payback Period (DPP). Payback measures liquidity, NPV measures direct dollar benefit, IRR measures percentage return with a safety margin built in, MIRR measures a percentage return considering a better reinvestment rate, and PI measures bang for the buck. However, NPV is the best single measure, and almost all firms now use NPV. These results are available in the Economic Results subtab (results for a single Option) as well as in the Portfolio Analysis tab, where the results from multiple Options are compared at once within a portfolio.

Discounted Cash Flow | Applied Analytics | Risk Simulation | Options Strategies | Options Valuation | Forecast Prediction | Portfolio Optimization | Knowledge Center

Custom Calculations | Option 1... | Option 2... | Option 3... | Option 4... | Option 5... | Portfolio Analysis

1. Discounted Cash Flow Model (DCF) | 2. Cash Flow Ratios | 3. Economic Results | 4. Information and Details

Discount Rate	NPV ($M)
15.00%	78.28
50.00%	12.00
51.00%	11.26
52.00%	10.54
53.00%	9.85
54.00%	9.19
55.00%	8.55
56.00%	7.93
57.00%	7.33
58.00%	6.76

Select the Discounting Convention to Use: Discrete Continuous 2

Select the Cash Flow to Use: NET CASH FLOW (NCF)

Terminal Period Annualized Growth Rate (%): 2.00% Discount out-year capital investments at IRR

Economic Indicators	Results	Economic Indicators	Results
Net Present Value (NPV)	78.28	Profitability Index (PI)	3.45
Net Present Value (NPV) with Terminal Value	148.87	Return on Investment (ROI)	244.62%
Internal Rate of Return (IRR)	73.16%	Payback Period (PP)	1.5723
Modified Internal Rate of Return (MIRR)	31.95%	Discounted Payback Period (DPP)	1.9007

Show NPV: 50 % to 100 % Update Net Present Value Profile Copy Results Copy Chart

All lessons are customizable (text, slides, graphics, etc.). We can create custom lessons for your users or you can do it yourself!

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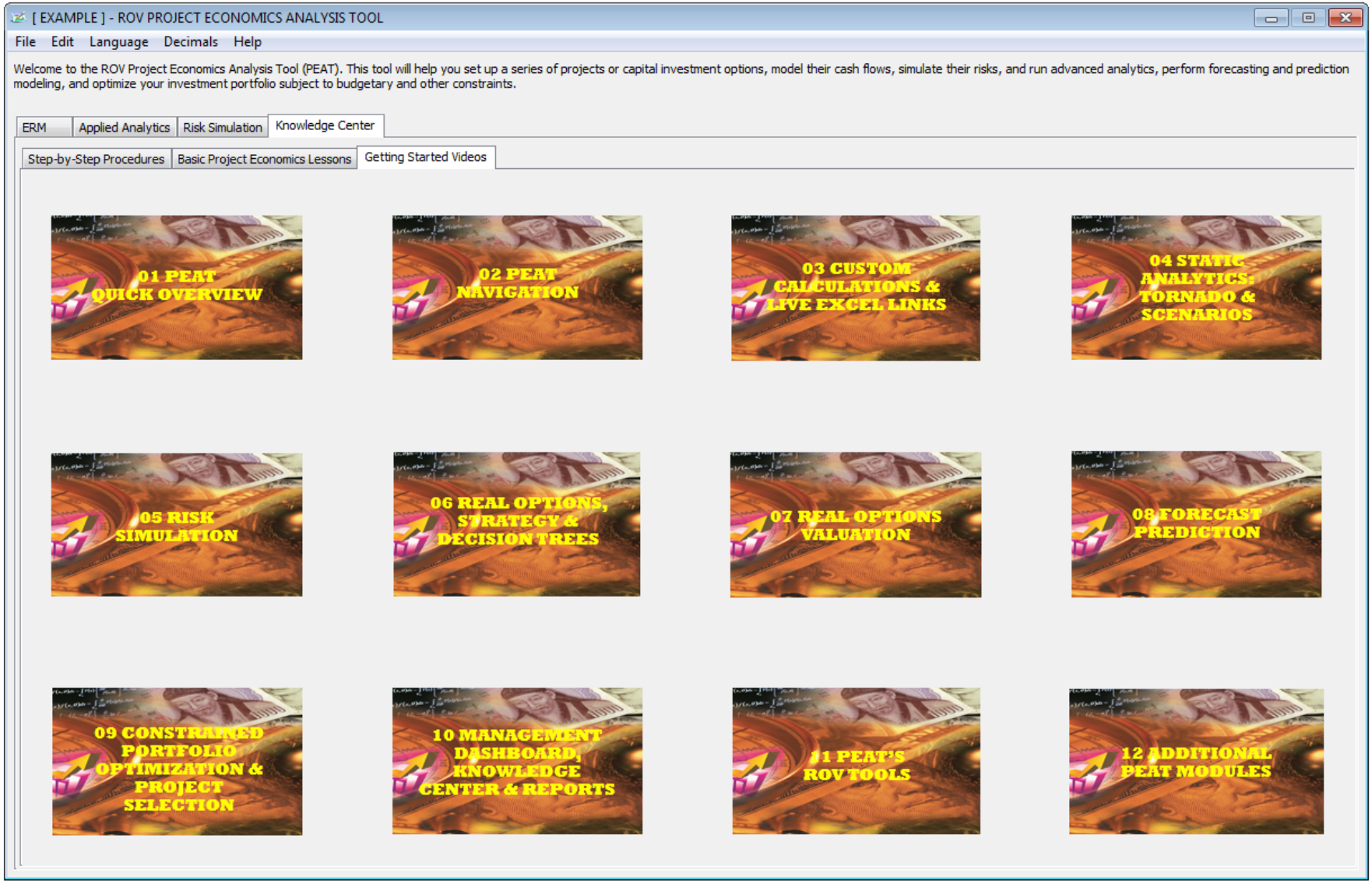

All video lessons are customizable

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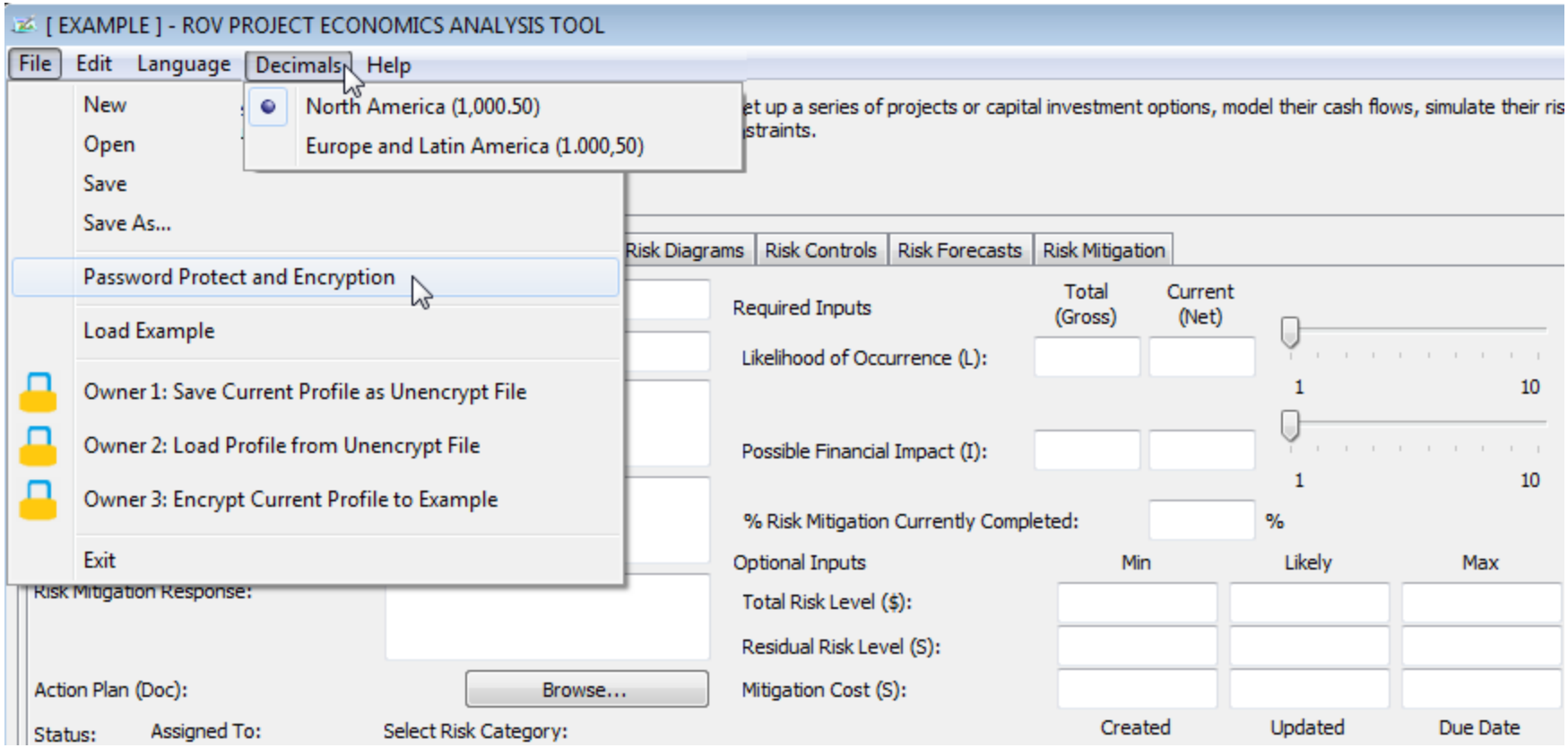
Data Encryption and Foreign System Support



The software comes with a 256-bit encryption protocols to encrypt your Risk Database and supports foreign decimal settings (e.g., USA settings for one thousand dollars and fifty cents is $1,000.50 versus a Latin American peso of P1.000,50 with interchangeable decimal and thousand separators)

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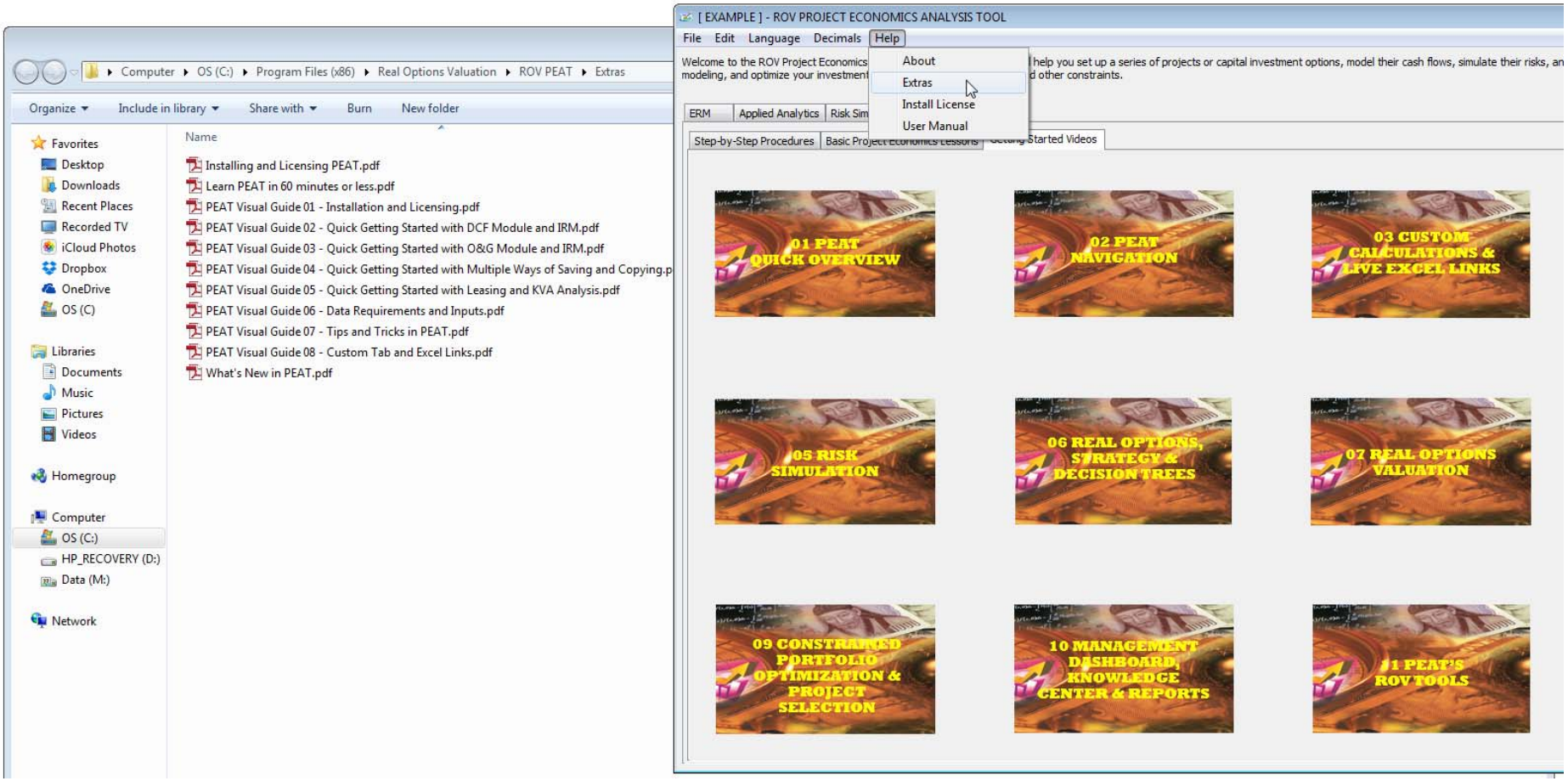
User Manuals, Quick Getting Started Guides, and White Papers



The Help menu provides multiple Visual Guides, Whitepapers, and User Manuals to quickly get you started using the software

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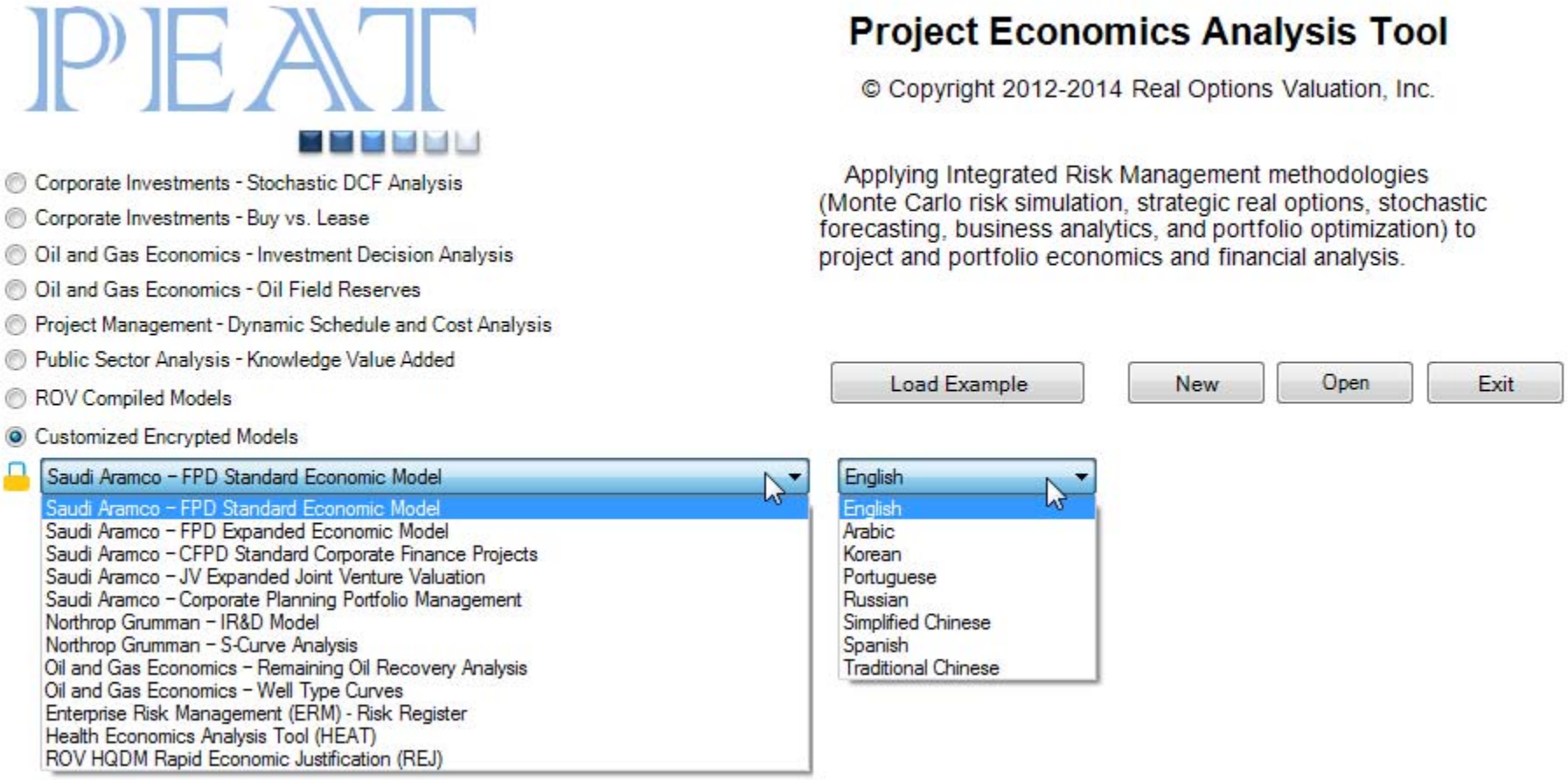
Additional Advanced Modules and Foreign Language Support



Multiple advanced analytical and decision analysis models accompany the PEAT software and complements the existing ERM module, including the Corporate Investment module, Project Management (Cost and Schedule Risk), and other relevant applications. The software also comes with multiple foreign language user interface.