Project Risk Management



Risks belong to projects as does air to breath.

Project Risk Management – The Most Importan... Roland Wanner

Murphy's Law

Murphy's Law

"Anything that can go wrong, will go wrong."

O'Toole's Law

"Murphy was an optimist."



PROACTIVE VS REACTIVE RISK IDENTIFICATION



The Risk Management Process

Effective Stakeholder Engagement (ESHE) is crucial for proper Risk Management



Risk Definitions

MEDIUM

Risk

An uncertain event or condition If it occurs, it will impact at least one project output / outcome

Issue

A risk (known or unknown) that has materialized

LOW

Trigger

An event that causes a risk to become an issue."



Risk has two components: 1. Probability: This is the likelihood that an event will occur. 2. Seriousness: This is the impact of the event if it does occur.

Million Dollar Maverick Alan Weiss

Typical Sources of Project Risk



The Risk Management Process







Critical Success Factors for Risk Management

Early, recurrent, and comprehensive identification

Multiple, diverse perspectives (objectivity)

Recognize the limitations of your sources & data



The Risk Management Process



Risk: Probability

ALMOST CERTAIN (5)	The risk is expected to occur at least once in the project
Likely (4)	The risk is expected to occur only once in every 3 projects
Possible (3)	The risk is expected to occur on only in every 10 projects
Unlikely (2)	The risk is expected to occur only once in every 25 projects
Rare (1)	The risk is expected to occur less than once in every 100 projects



Qualitative Risk

Relating to, measuring, or measured by the QUALITY of something rather than its QUANTITY

The IMPACT the risk will have on the project.



Quantitative Risk



Probability / likelihood of trigger event occurring

Quantitative (statistical) methods

Mean, median, mode Three-point estimates Expected value Monte Carlo analysis Almost certain Likely Possible Unlikely Rare

Possible

Qualitative (subjective) priority

56% chance of rain

PROJECT MANAGEMENT

Ways to determine Risk Probability

Mean, median, mode

Three-point estimates (PERT)

Expected value

Monte Carlo analysis



Risk: Using the Numbers

	46 %
Our party is to be held 15 November.	34%
Over the past 5 years the chances of inclement weather striking on that date are:	40 %
	39 %
	34%

Risk: Using the Numbers

Historic Data Percentages of Rain: <mark>4</mark> 6%	Mean (Average): <u>38.6</u> Median: <u>40</u> Mode: <u>34</u> Highest Historical #: <u>46</u>	
34%	Lowest Historical #: 34	
	PERT = Optimistic + (4x Most Likely) + Pessimistic / 6	
40%	PERT = 34 + (4 x 34) + 46 / 6	
39%	PERT = 34 + (136) + 46 / 6	
	PERT = 216 / 6	
34%	PERT = 36	

Risk: Expected Value

Uses estimated probabilities to examine possible outcomes

To calculate: multiply the value of the variable by the probability of it occurring.

Think of rolling a six-sided die.

Once you roll the die it has an equal 1/6th chance of landing on 1, 2, 3, 4, 5 or 6

 $(1/6 \times 1) + (1/6 \times 2) + (1/6 \times 3) + (1/6 \times 4) + (1/6 \times 5) + (1/6 \times 6) =$

3.5

If you were to roll the dice multiple times you would see the average is 3.5

Risk: Monte Carlo Analysis

Calculates the range of possible outcomes and the probabilities they will occur for any choice of action.

Developed by scientists working on the Atom Bomb and was named for the city.

Common Distributions include:

Normal: Bell Curve

Lognormal: Positively skewed outcomes

Uniform: All values have equal chance of occurring

Triangular: User defined Minimum, Most Likely and Maximum values of occurrence

PERT: Optimistic, Most Likely and Pessimistic

Discrete: User defined thresholds

Risk Probability (defined)

Almost Certain (5)	Greater than 90% chance this opportunity / risk will happen
Likely (4)	Greater than 70% chance this opportunity / risk will happen
Possible (3)	Greater than 50% chance this opportunity / risk will happen
Unlikely (2)	Greater than 30% chance this opportunity / risk will happen
Rare (1)	Less than 30% chance this opportunity / risk will happen

Risk: Putting it all together

Almost Certain (5)	Greater than 90% chance this opportunity / risk will happen
Likely (4)	Greater than 70% chance this opportunity / risk will happen
Possible (3)	Greater than 50% chance this opportunity / risk will happen
Unlikely (2)	Greater than 30% chance this opportunity / risk will happen
Rare (1)	Less than 30% chance this opportunity / risk will happen

A 36% chance means it is UNLIKELY we will experience inclement weather for the date of the party

Risk: Prize Winners Don't Attend the Party

Triggers:

1: Not enough notice given. Invites currently scheduled to go out two weeks before the party. (Likely)

2: They are too busy working to attend. (Unlikely)

3: Accident / Injury / Illness (Rare)

Probability Score

1: Likely (4)

2: Unlikely (2)

3: (Rare 1)

Overall Risk Probability????

Almost Certain (5), Likely (4), Possible (3), Unlikely (2), Rare (1)

Risk: Prize Winners Don't Attend the Party

Triggers:

1: Not enough notice given. Invites currently scheduled to go out two weeks before the party. (Likely)

2: They are too busy working to attend. (Unlikely)

3: Accident / Injury / Illness (Rare)

Probability Score

1: Likely (4)

2: Unlikely (2)

3: (Rare 1)

Overall Risk Probability: 4 LIKELY

Almost Certain (5), Likely (4), Possible (3), Unlikely (2), Rare (1)

IMPACT / CONSEQUENCES IF A RISK BECOMES AN ISSUE

WHAT IS IMPACTED

Time / Cost / Scope

Health and Safety

Business as usual

Natural Environment

Brand and Reputation

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QUALITATIVE (SUBJECTIVE) PRIORITY

Massive

Major

Moderate

Minor

Insignificant

Risk Impacts



Risk Impact: Time and Cost

		NEGATIVE IMPACT (-)	POSITIVE IMPACT (+)
	Massive (5)	Will increase time/cost by greater than 50%	Will reduce time/cost by greater than 50%
	Major (4)	Will increase time/cost by less than 50%	Will reduce time/cost by less than 50%
	Moderate (3)	Will increase time/cost by less than 25%	Will reduce time/cost by less than 25%
	Minor (2)	Will increase time/cost by less than 10%	Will reduce time/cost by less than 10%
	Insignificant (1)	Will increase time/cost by less than 5%	Will reduce time/cost by less than 5%

Risk Impact: Project Scope and Outcomes

	NEGATIVE IMPACT (-)	POSITIVE IMPACT (+)
Massive (5)	Changes to scope that mean the project will not realize most or all of its intended outcomes	Changes to scope meaning the project will realize a number of new (unplanned) benefits
Major (4)	Changes to scope that mean the project will not realize some of its intended outcomes	Changes to scope that benefit entirely new groups of stakeholders
Moderate (3)	Changes to scope that will no longer benefit some stakeholder groups	Changes to scope that benefit a larger group of existing stakeholders
Minor (2)	Changes to scope that mean the project's intended outcomes are now noticeably overstated	Changes to scope which mean the intended outcomes are now noticeably understated
Insignificant (1)	Changes to scope the mean the project's outcomes will fall short on a small number of measures	Changes to scope that slightly enhance the projects benefits

Risk Impact: Business as Usual

	NEGATIVE IMPACT (-)	POSITIVE IMPACT (+)
Massive (5)	Catastrophic failure in operations with considerable time to restore (Could be on-going)	Operational disruption is avoided entirely
Major (4)	Widespread disruption to operations with an uncertain timeframe for resolution	The need for operational disruption is significantly reduced
Moderate (3)	Disruption to operations and/or priority customers demanding major intervention	Operational outages can significantly reduced in frequency duration or impact
Minor (2)	Localized disruption that demands minor corrective action	Operational outages can be reduced in frequency, duration or impact
Insignificant (1)	Negligble impact on operations - no discernible disruption	Operational outages can be better planned for and anticipated

Risk Impact: Health and Safety

	NEGATIVE IMPACT (-)	POSITIVE IMPACT (+)
Massive (5)	Permanent disability or fatality	Reduce instances of permanent disability or fatality
Major (4)	Extensive injuries or widespread illness	Reduction of extensive injuries or widespread illness
Moderate (3)	Hospital admission/ongoing medical treatment	Reduced instances of Hospital admission/ongoing medical treatment
Minor (2)	Minor injury/illness requiring out-patient care	Reduced instances of minor injury/illness requiring out-patient care
(1) Superficial injuries with little or no treatment required		Reduced instances of superficial injuries

Risk Impact: The Natural Environment

	NEGATIVE IMPACT (-)	POSITIVE IMPACT (+)
Massive	Widespread and irreversible	Environmental benefits that are wide-
(5)	environmental damage	spread and self-sustaining
Major (4)	Environmental damage that will continue beyond the life of the project	Environmental benefits that are sustainable beyond the life of the project
Moderate (3)	Environmental damage that extends beyond the location of the project - but no impacts	Environmental benefits that are sustainable beyond the location of the project
Minor	Damage within the projects boundaries	Environment benefits that are specific to
(2)	that can be easily remedied	the location of the project
Insignificant	Small-scale or localized damage that	Environmental benefits that are specific
(1)	will quickly self repair	to the location of the project

Risk Impact: Brand and Reputation

		NEGATIVE IMPACT (-)	POSITIVE IMPACT (+)
	Massive (5)	Will cause a fundamental loss of community/stakeholder confidence in our project or org	Will generate whole of community enthusiasm for our project or org
	Major (4)	Cause alarm among stakeholders - likely that regulators or owners will take action	Will generate excitement for the project among new and existing stakeholders
	Moderate (3)	Will cause stakeholders to actively express their dissatisfaction	Will encourage stakeholders to actively express support for the project
	Minor (2)	Will register with stakeholders and cause them concern	Will register with stakeholders and heighten their interest
Insignifican (1)		Will only be of interest to the project team	Will only be of interest to the project team

The Risk Management Process



Overall Risk Priority

PROBABILITY x IMPACT

	Risk Matrix		IMPACT				
			INSIGNIFICANT (+/-1)	MINOR (+/- 2)	MODERATE (+/- 3)	MAJOR (+/- 4)	MASSIVE (+/-5)
	P R	ALMOST CERTAIN (5)	+/-5	+/- 10	+/- 15	+/- 20	+/- 25
	O B	LIKELY (4)	+/- 4	+/- 8	+/- 12	+/- 16	+/- 20
	A B I	POSSIBLE (3)	+/- 3	+/- 6	+/- 9	+/- 12	+/- 15
	Ĺ	UNLIKELY (2)	+/- 2	+/- 4	+/- 6	+/- 8	+/- 10
	T Y	RARE (1)	+/- 1	+/- 2	+/- 3	+/- 4	+/-5

Risk Matrix		IMPACT							
		INSIGNIFICANT (+/-1)	MINOR (+/- 2)	MODERATE (+/- 3)	MAJOR (+/- 4)	MASSIVE (+/-5)			
P R	ALMOST CERTAIN (5)	T							
O B	LIKELY (4)				-16				
A B I	POSSIBLE (3)								
Ĺ	UNLIKELY (2)								
T Y	RARE (1)								

Risk: Prize winners do not attend the party

		IMPACT INSIGNIFICANT ('/-1) MINOR ('/-2) MODERATE ('/-3) MAJOR ('/-4) MASSIVE ('/-5) ST IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII				
Risk Matrix		INSIGNIFICANT (+/-1)	MINOR (+/- 2)	MODERATE (+/-3)	MAJOR (+/- 4)	MASSIVE (+/-5)
P R	ALMOST CERTAIN (5)	T				
O B	LIKELY (4)					
A B I	POSSIBLE (3)					
Ĺ I_	UNLIKELY (2)					-10
Ϋ́	RARE (1)					

Risk: Only 20 people attend (instead of the 200 planned for)

Risk Matrix		IMPACT							
		INSIGNIFICANT (+/-1)	MINOR (+/- 2)	MODERATE (+/- 3)	MAJOR (+/- 4)	MASSIVE (+/-5)			
P R	ALMOST CERTAIN (5)	R							
O B	LIKELY (4)								
A B I	POSSIBLE (3)								
Ļ	UNLIKELY (2)								
T Y	RARE (1)		-2						

Risk: Bad weather hits the area

Risk Matrix		IMPACT							
		INSIGNIFICANT (+/-1)	MINOR (+/- 2)	MODERATE (+/-3)	MAJOR (+/- 4)	MASSIVE (+/- 5)			
P R	ALMOST CERTAIN (5)	T							
O B	LIKELY (4)								
A B I	POSSIBLE (3)								
Ĺ I_	UNLIKELY (2)								
T Y_	RARE (1)	1							

Risk: Staff too busy working to attend the party

The Risk Management Process



IMPACT (NOTE: POSITIVE OR NEGATIVE)

RISK MATRIX	+/- 1 INSIGNIFICANT	+/- 2 MINOR	+/- 3 MODERATE	+/- 4 MAJOR	+/-5 MASSIVE
5 ALMOST CERTAIN	+/-5	+/- 10	+/- 15	+/- 20	+/- 25
4 LIKELY	+/-4	+/-8	+/- 12	+/- 16	+/- 20
3 POSSIBLE	+/-3	+/-6	+/-9	+/- 12	+/- 15
2 UNLIKELY	+/-2	+/-4	+/-6	+/- 8	+/- 10
1 RARE	+/-1	+/-2	+/-3	+/-4	+/-5

P R O B A B I L I T Y

Treating Risks



Risk Tolerance / Appetite / Threshold

The degree, amount, or volume of risk that an organization or individual will withstand.

ALL people/organizations/ elements have varying degrees of risk tolerance.





ROAM Risk Management

RESOLVED Their is no longer a risk

OWNED Someone has accepted responsibility for managing the risk

ACCEPTED Choosing to take no action on the risk

MITIGATED Risk is reduced, but not eliminated

When the stakes are high, preparation is everything.

An Astronaut's Guide to Life on Earth Chris Hadfield

Risk Treatment Strategy: High Risk

High Risk requires IMMEDIATE action.

Act immediately by adding tasks to (or removing tasks from) the project plan until the residual risk is LOW

You can:

- Change probability (Transfer or outsource)
- Change impact (Share ie insurance)
- Avoid (Remove the risk source)

TO UPDATE: Scope Document (WBS or other), Project Schedule and Project Budget

	Project Profile Tool
Project name:	
	Use the dropdown menus to select the relevant risks
	Greater than 15% of program budget
Project cost	Greater than 25% margin of error assumed in cost estimate
	Expected costs are neither allowed for in the annual budget nor externally financed
	The project will take more than 6 months to deliver
Project time	Greater than 25% margin of error assumed in time estimate
	The project must be delivered on or by a fixed date
Project scope	We have never successfully delivered a project like this
	Project delivery will noticeably impact most or all of our organization, including core service delivery
Device the second	The project has several major precedent or subsequent dependencies
Project Impact	Employees and/or the public may be at risk of serious injury, illness or loss of life during project delivery
	Project outcomes will fulfil most or all of the strategic objectives of our organization
	The project will depend on collaboration with new and/or unknown partners
Project stakenoiders	The project and/or its outcomes will be highly visible in the community
THIS PROJECT IS:	HIGH RISK

Risk Treatment Strategy: MEDIUM Risk

A Medium Risk requires us to establish a contingency.

Introduce TIME / COST Contingencies that respond to the risk and identify TRIGGERS for their activation.

A contingency is an action that is only exercised if the risk triggers and becomes an issue.

TO UPDATE: Risk Register, Project Schedule and Project Budget

	Project Profile Tool
Project name:	
	Use the dropdown menus to select the relevant risks
	Between 5-15% of program budget
Project cost	±25% confidence in cost estimate
	Expected costs are partially allowed for in the annual budget or financed by the client
	The project can be delivered in less than 6 months
Project time	±25% confidence in time estimate
	The project has a preferred (but not mandated) delivery window
Project scope	We have successfully delivered this project at least once before
	Project delivery will noticeably impact several departments in our organization
	The project has some major precedent or subsequent dependencies
Project impact	Employees and/or the public may be at risk of minor injury or illness during project delivery
	Project outcomes will fulfil several strategic objectives of our organization
Drojact stakehold	Some project work will need to be shared with proven, existing partners
Project stakeholders	There is likely to be some community interest in the project and/or its outcomes
THIS PROJECT IS	

Contingency Reserves

Pre-authorized reserve of time or money

Best maintained at the task level

Returned to the business when risk retired

Enables speedy response in a crisis

Encourages more comprehensive risk identification and management

For: KNOWN UNKOWNS



Management Reserves

General cash reserve maintained for "surprises"

Best maintained at the program / portfolio level

Usually a fixed percentage of the program's total time and budget

Distributes risk across multiple projects

Gives greater flexibility in a crisis

For: UNKNOWN UNKNOWNS



Risk: What if Prize Winners Do Not Attend?

Contingency plan

Announce the first runner-up as the winner (Update schedule, budget and risk register to reflect this)



Risk: What if Prize Winners Do Not Attend?

Contingency plan

Announce the first runner-up as the winner (Update schedule, budget and risk register to reflect this)

Secondary risks

Prize winners names engraved on awards



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Contingency plan

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Residual Risks

Backlash if people find out the real winner



Risk Treatment Strategy: LOW Risk

Stakeholders should be notified any time an identified risk will impact operations or introduce a risk into other areas of the business.

Accept the risk by maintaining current actions, resources and strategies to prevent the risk escalating into an issue.

TO UPDATE: Risk Register

	Project Profile Tool
Project name:	
	Use the dropdown menus to select the relevant risks
	Less than 5% of program budget
Project cost	±10% confidence in cost estimate
	Expected costs are fully allowed for in the annual budget or financed by the client
	The project can be delivered in less than 3 months
Project time	±10% confidence in time estimate
	The project has no fixed deadline for delivery
Project scope	We have successfully delivered this project five (5) or more times
	Project delivery will noticeably impact one (1) department in our organization
Project impact	The project has no major precedent or subsequent dependencies
i loject impact	Project delivery presents no employee or public health and/or safety risks
	Project outcomes will fulfil one (1) strategic objective of our organization
Project stakeholders	The project can be fully delivered by our current staff
roject stakenoidels	The project is only of internal interest to our organization
THIS PROJECT IS:	LOW RISK

The Risk Management Process



Risk Register Components

Identification number Risk description A risk owner Probability / impact ratings Risk treatment Probability and impact detail Action and contingency plans Residual and secondary risks Last / next review date



<< Back	<< Back to Register		rize winners don't attend the party			Nex	t Risk >>
Ref	RISK / OPPORTUNITY	OWNER	PROBABILITY	IMPACT	PRIORITY	LAST REVIEW	NEXT I
3 Prize win	ners don't attend the party	Angus P	Likely	Major	High		
			RISK DETAIL				
			PROBABILITY				
TRIGGER EVENT		NO	NOTES PROBABILITY			RAT	
Not enough notic party)	Not enough notice given (invites only going out 2 weeks prior to party)			There is a greater than 70%	chance this opportunity / risk	will happen	Lik
Too busy working	Too busy working to attend			There is a greater than 30% chance this opportunity / risk will happen			Unli
Accident / Injury	/ Illness			There is a greater than 30%	will happen	Unlii	
			ІМРАСТ				
FA	CTOR	NOTES			IMPACT		RAT
Т	IME			The opportunity / risk will ha	ve no impact on project time		No
с	OST			The opportunity / risk will have no impact on project cost			No
COST SCOPE				The risk will demand changes to scope that mean the project outcomes are now noticeably overstated		ect's intended	Minor n
OPER	ATIONS			The opportunity will mean th and planned for	at operational outages can be	better anticipated	Insignifica
HEALTH	HEALTH & SAFETY			The opportunity / risk will not impact people's health and/or safety		r safety	No
BRAND / F	REPUTATION			The risk will cause alarm among stakeholders - it is likely that regulato owners will take intervening action		at regulators and/or	Major n
NATURAL E	NVIRONMENT			The opportunity / risk will no	t impact the natural environme	nt	No

Risk Management Overview



Take-aways from Risk

Issues materialize after identified or unidentified trigger events occur.

Following the process will help alleviate pains from risks and issues.

Knowing how to strategically address risk will make your projects more successful.

Questions?





