Deriving Certainty from Uncertainty (Value from Project risk and Contingency Management)

PGCS Canberra 20 & 21 August 2019

RiskTools

Understand and manage your risk

Outline

- Why undertake PROJECT risk management?
- Value – Some thoughts on measurement
- KISS processes
- KISS toolsets
- Contingency
- Integration – Management and Governance
- Cost
- Value Summary

RiskTools

Understand and manage your risk

Quick poll

- Who is operating at:
  - Project Manager level?
  - Programme or Portfolio Level?
  - Enterprise Risk Managers?
  - Any CFOs?
- Is your organisation an:
  - Asset Owner?
  - Contractor?
  - Consultant?

RiskTools

Understand and manage your risk

Why PROJECT risk management?

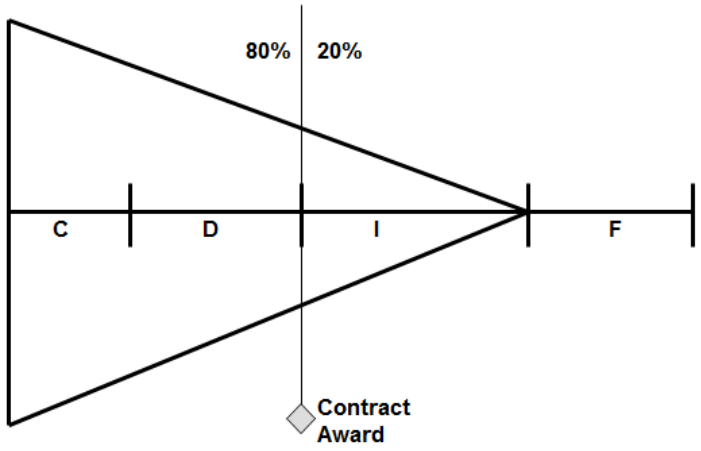
Project risk management requires a different approach to "Operational" risk management:

- **A rapidly changing risk profile**

RiskTools

Understand and manage your risk

A rapidly changing risk profile



RiskTools

Understand and manage your risk

Why PROJECT risk management?

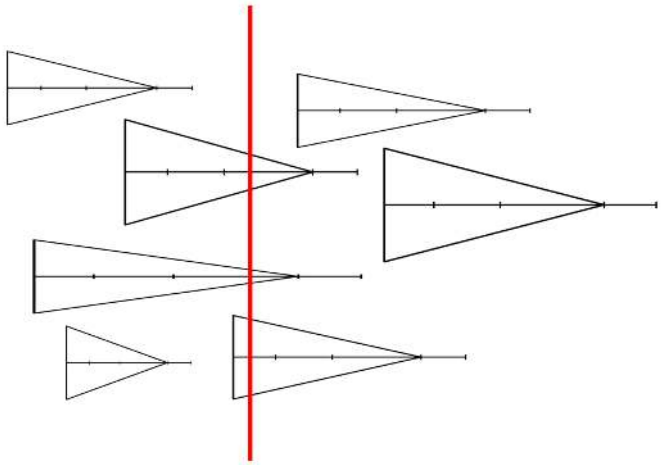
Project risk management requires a different approach to "Operational" risk management:

- **A rapidly changing risk profile**
- **Projects of different size and overlapping cycles**

RiskTools

Understand and manage your risk

Projects of different size and overlapping Cycles



RiskTools

Understand and manage your risk

Why PROJECT risk management?

Project risk management requires a different approach to "Operational" risk management:

- **A rapidly changing risk profile**
- **Projects of different size and overlapping cycles**
- **Management at various levels – project, programme, portfolio and executive**
- **Consumes precious capital**

RiskTools

Understand and manage your risk

Why undertake PROJECT risk management?

- **Improved decisions (better information)**
- **Ability to make decisions earlier**
- **Improve the potential for project success**

RiskTools

Understand and manage your risk

Risk Management Maturity

Continuum	Capability Attributes	Method of Achievement
Optimising	(Continuous feedback) Risk management a source of competitive advantage	• Increased emphasis on exploiting opportunities • "Best of class" processes • Knowledge accumulated and shared
Managed	(Quantitative) Risks measured/managed quantitatively and aggregated enterprise wide	• Rigorous measurement methodologies/analysis • Intensive debate on risk/reward trade-off issues
Defined	(Qualitative/Quantitative) Policies, processes and standards defined and institutionalised	• Process uniformly applied across the organisation • Remaining elements of infrastructure in place • Rigorous methodologies
Repeatable	(Intuitive) Process established and repeating; reliance on people continues	• Common language • Quality people assigned • Defined tasks • Initial infrastructure elements
Initial	(Ad Hoc/Chaotic) Dependent on heroics; institutional capability lacking	• Undefined tasks • Relies on initiative • "Just do it" • Reliance on key people

RiskTools

Source: Protiviti 2006

Understand and manage your risk

Value – some suggested ways of measuring

- Efficient:
  - processes
  - toolsets
- Effective: Processes and toolsets that enable:
  - Informed decisions
  - Timely decisions
  - To be made at the right management level
- At an appropriate cost

RiskTools

Understand and manage your risk

So let's start with process

- What do you record in your risk register?

RiskTools

Understand and manage your risk

Risk management

- The AS/NZS 4360 or ISO 31000 have the same founding process:
  - Context
  - Identification of a risk
  - Analysis
    - Likelihood (of occurrence)
    - Impact (on objectives)
  - Treatment(s)
    - Monitoring (responsibility) and
    - Control (action/review date)
- The key is that you do not need anything else! (KISS is our mantra!!)

RiskTools

Understand and manage your risk

You do not need items such as:

- Residual risk
- Risk Owners
- Exposure
- Risk Appetite
- Aggregation – will touch on this shortly
- Consequence tables etc

- to manage risks effectively
- and certainly do not need them if you want to manage risks efficiently!!
- You will get resistance – it is not why any of the above may be needed – the question should be can I manage risks without them.

RiskTools

Understand and manage your risk

Context – Risk Breakdown Structure (RBS)

- Management
  - Procurement
  - Approvals
  - Reporting
- Commercial
  - Variations
  - Programme
  - Financing
- Constructability
  - Assembly areas
  - Access etc

RiskTools

Understand and manage your risk

ISO 31000 2018 – A Guidance document

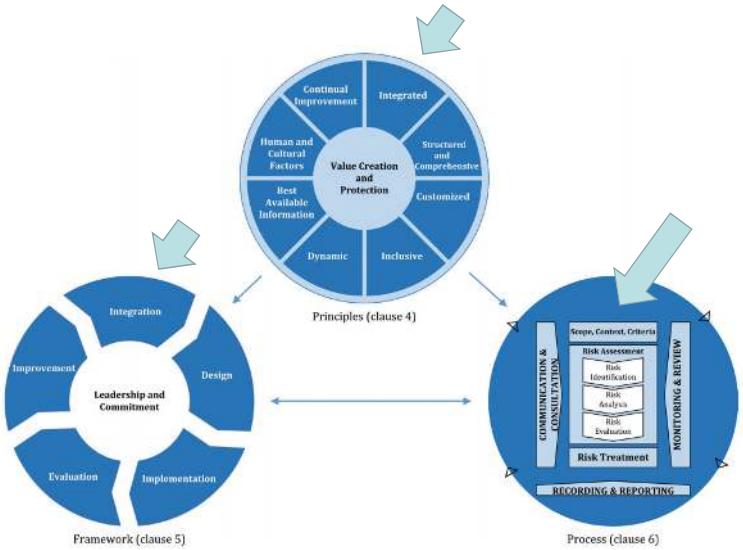


Figure 1 — Principles, framework and process

RiskTools

Understand and manage your risk

Describing a risk

The Guide to the old AS/NZS 4360 had a very succinct (KISS!!) way of describing a risk:

- (Something happens) leading to (outcomes expressed in terms of impact on objectives)

One essential component that is often missing is Objectives.

- ISO31000 definition of Risk – *effect of uncertainty on Objectives.*

RiskTools

Understand and manage your risk

Objectives – what should they look like?

- SMART?
- Whatever your definition two aspects are essential:
  - Measurable (how else do you know what you are trying to achieve and demonstrate you have achieved it)
  - Time bound (when are you going to complete the activity/project)
- Analysis enables objectives to a key part of the process:
  - Impact (if a risk occurs) on objectives

RiskTools

Understand and manage your risk

Analysis Guide - Likelihood

Likelihood	Description - general	Description - project	Indicative frequency
Almost Certain	The event will occur on an annual basis	Can be expected to occur during the project	Once a year
Likely	The event has occurred several times or more in your career	May occur during the project	Once in 3 years
Possible	The event may occur once in your career	Has occurred on an earlier project	Once in 10 years
Unlikely	The event does occur somewhere from time to time	Could but not expected to occur during the project	Once in 30 years
Rare	Heard of something like this occurring elsewhere	Conceivable but highly unlikely to occur during the project	Once in 100 years

RiskTools

Understand and manage your risk

Analysis Guide - Impact

Scale	Financial - %cost overrun from contract price	Project	Time % overrun from planned
Severe	20 +%	Most objectives cannot be achieved	20 +%
Major	10-20%	Some objectives cannot be achieved	10-20%
Moderate	5-10%	Some objectives affected	5-10%
Minor	2-5%	Minor effects that are easily remedied	2-5%
Insignificant	0-2%	Negligible impact upon objectives	0-2%

RiskTools

Understand and manage your risk

Treatments

- Each Treatment must have:
  - An Owner
  - An Action/Review date
- After workshops Treatments are where the real risk management occurs!!

RiskTools

Understand and manage your risk

Integration - the role of Objectives

- Project Objectives will:
  - Be more detailed than Programme objectives
  - Be subordinate to but support Programme objectives
- Programme Objectives will
  - Be more detailed than Executive (eg Business plan) objectives
  - Be subordinate to but support Executive objectives
- Similarly for Portfolios
- Objectives enable an updating of the Analysis of those risks that are rolled up to the next level.
- Note this is not a process that can be automated!!!

RiskTools

Understand and manage your risk

Effectiveness (and benefits)

- RBS
  - Consistent approach – workshops structured with ownership and improved understanding of project by stakeholders
  - Ability to cut and dice information (eg identify systemic risks)
  - Can be applied to any Risk Management in an organisation
- Objectives
  - Process helps to refine objectives and stakeholder understanding
  - Integrates Project with other management levels (eg Programme)
  - Overcomes the problems associated with the one size fits all of Consequence tables

RiskTools

Understand and manage your risk

The need for a specific toolset includes:

- Easy collection of data particularly in a workshop environment (ie one screen for data entry)
- Easy updating of data
- Ensuring data integrity (ie single responsibility for data but wide spread access to reports)
- Ready sharing of data (internally and externally)
- Reports that enable effective management
- Being readily accessible wherever and whenever people might be working
- Etc etc…..
- All of which points to a Cloud database solution.

RiskTools

Understand and manage your risk

Standards, Processes and Toolsets

Should work from the "bottom" up

RiskTools

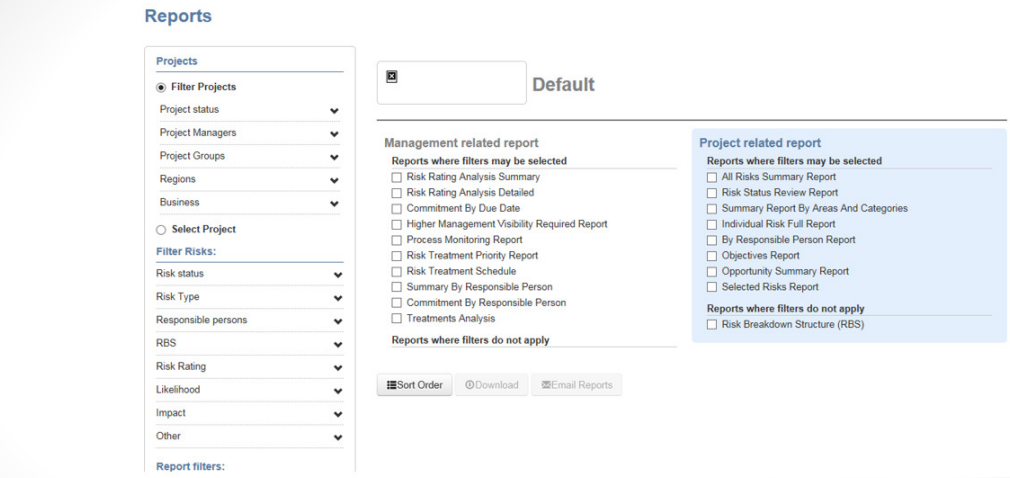
Understand and manage your risk

RiskOrganizer – single data entry screen

RiskTools

Understand and manage your risk

Reports numerous filters and reports



RiskTools

Understand and manage your risk

Effectiveness – How software assists

- Reports that focus on:
  - Project risks and
  - Management of risks
- Reports that can be filtered to suit specific requirements
  - Analysis or rating
  - Status of Treatments
  - Inter-project comparison
    - Who needs support?
  - RBS
    - Programme Managers
    - Line Managers
- Access at any time – ie when information is needed

RiskTools

Understand and manage your risk

Contingency

A quick poll:

- **Who is undertaking cost contingency?**
- **It has been a driver of cost management since 2008:**
  - **Department of Infrastructure, Transport, Regional Development and Local Government**
  - ***Best Practice Cost Estimation for Publicly Funded Road and Rail Construction***
- **More recently:**
  - **Risk Engineering Society and Engineers Australia**
  - ***Contingency Guideline (2nd edition Feb 2019)***

RiskTools

Understand and manage your risk

Contingency

- **Contingency = cost of carrying risk**
- **Two elements:**
  - **Contingent risk – those risks that <u>may</u> happen – derived from qualitative workshops**
  - **Inherent risk – those risks associated with work that <u>has</u> to be done to undertake the project as detailed in the project estimate. Inherent contingency reflects the uncertainty associated with the estimate (quantities and/or rates).**

RiskTools

Understand and manage your risk

Example of how some are assessing Contingent risk

- Take likelihood (eg 40% probability)
- Assess worse case (eg $100,000)
- Combine (40% * 100K = $40,000 contingency allowance)

- What's wrong with this?
  - 60% of time risk will not occur
  - Worse case rarely occurs and certainly not for all risks

RiskTools

Understand and manage your risk

Contingent risk

- How to assess?
  - Same as before:
    - Assess likelihood (eg 40%)
    - Assess worse case (eg $100,000)
  - But also assess:
    - Best case and most likely values
- Only consider risks with direct cost implications
- Undertake a Monte Carlo simulation

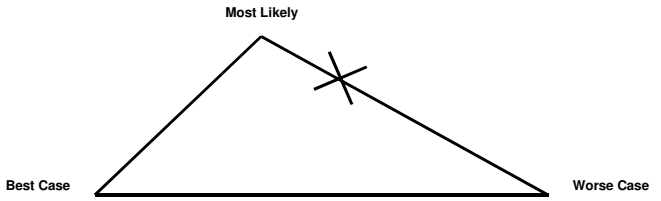
RiskTools

Understand and manage your risk

Monte Carlo simulation

Selects risk based on likelihood (will call up risk 40% of the time but 60% of time will not be applicable = 0)

Takes a value at random between best case and worse case but weighted towards most likely (based on area of triangle)



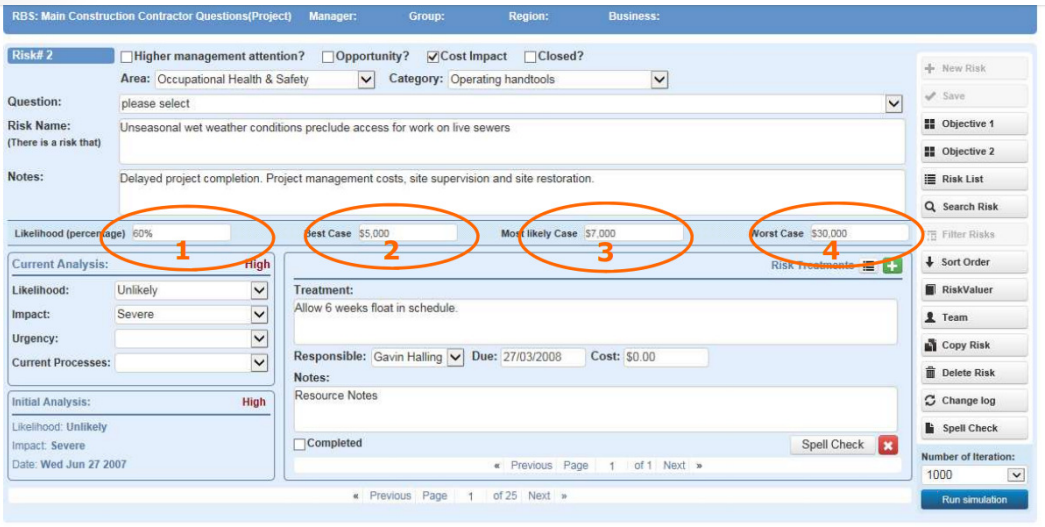
Totals the value for all risks

Repeats the exercise 1000 times (say) – ie it models the likely total value of risks

RiskTools

Understand and manage your risk

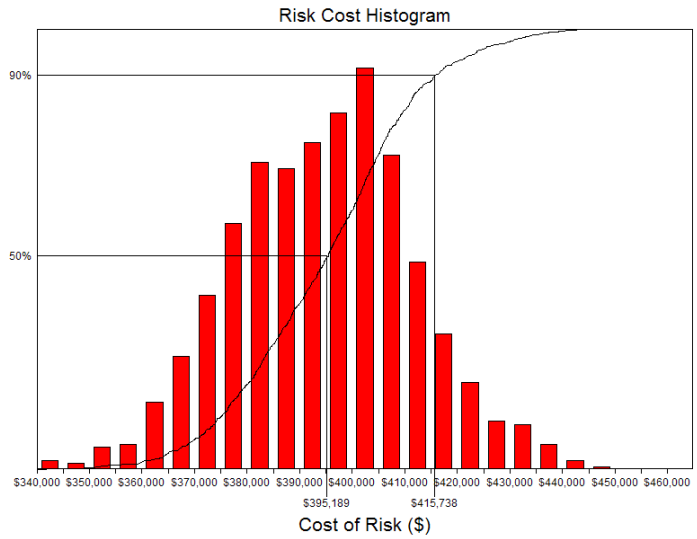
RiskValuer (RiskOrganizer's inbuilt MC model)



RiskTools

Understand and manage your risk

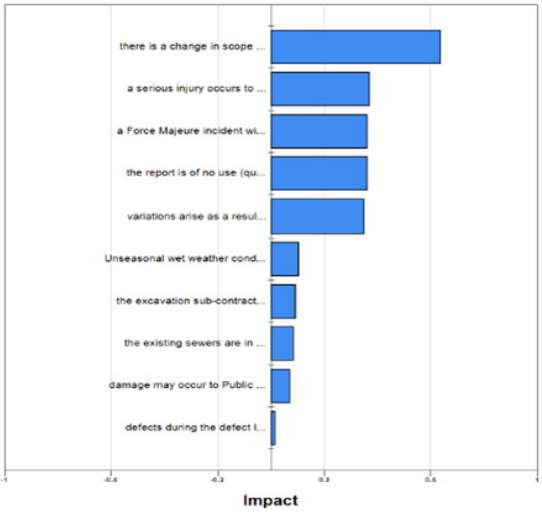
Monte Carlo Output



RiskTools

Understand and manage your risk

Tornado Diagram



RiskTools

Understand and manage your risk

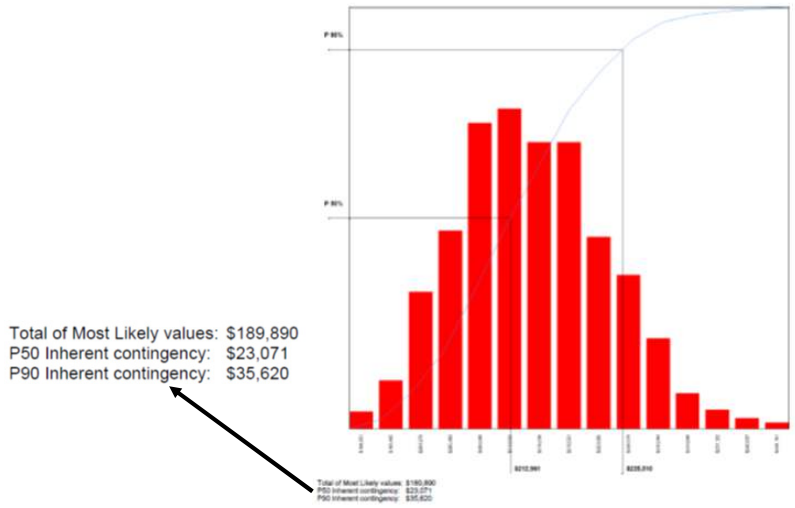
Inherent risk contingency

- Develop a model that enables a range of quantities and rates to be assessed (ie Best case and Worst case for each item in the estimate)
- The Most Likely value will be the original estimate value
- Hold an "inquisitorial" workshop so that data accuracy may be tested and potentially omitted items identified.

RiskTools

Understand and manage your risk

Histogram Output



RiskTools

Understand and manage your risk

Estimates

- The above processes quantify the costs of Contingent and Inherent contingency
- Need to ensure no "double dipping" within and between the two processes (eg LDs)
- P50s and P90s may then be added from both processes to obtain an assessment of the most likely cost of carrying risk
- (Values other than P90 can also be selected)

RiskTools

Understand and manage your risk

Use of P50 and P90

- The P50 value represents the expected cost of carrying risks
  - At a point in time (when the simulation is run)
  - The actual end result may be a little over or under P50
  - More conservatively the P90 is that point below which 90% of the iterations fell.
- Usage depends on your business
  - A Tenderer will probably use P50
  - An Asset Management company may use P90 for Board approval
  - The Project Manager will normally only be authorised P50 for risk. The difference between the P90 and P50 may be held by senior management as a reserve.
  - If the Project Manager requires additional funding to cover risks, then an additional approval processes is required to access this "reserve" fund.

RiskTools

Understand and manage your risk

Benefits

- A simple process that is easy to follow and quickly undertaken
- Visibility in the values used for deriving contingency
- The ability to see which risks have the greatest effect on the bottom line. This helps to prioritise which risks should be addressed first
- Improved stakeholder confidence due to a visible process
- The ability to amend and update data very quickly to accommodate changes
- Reduced stress levels – (if someone doesn't like the bottom line they can suggest and take responsibility for changing the inputs!)

RiskTools

Understand and manage your risk

Efficient and Effective

Efficient:

- Data management and simulation all in the hands of the project team.
- With CE others can also run simulation at any time and for any combination of projects.
- Can run simulation whenever you want at anytime.

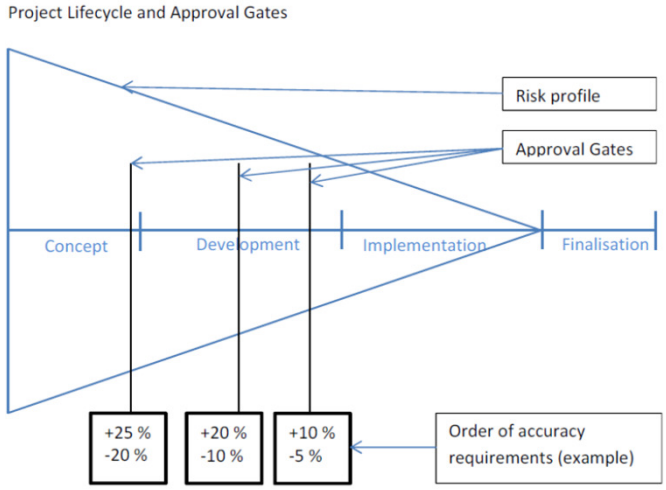
Effective

- Encourages a team approach – shared understanding and ownership
- Produces immediate results and enables a focus on what to work on next
- Visibility – improved stakeholder confidence

RiskTools

Understand and manage your risk

Financial Gatekeeping



RiskTools

Understand and manage your risk

Example

- **Inherent outputs:**
  - **Total of Most Likely values (ie the base estimate) $190,000**
  - **P50 Inherent Contingency $ 20,000**
- **To this needs to be added the P50 for Contingent risks.**
  - **Let's say this was $25,000.**
- **Hence, total Contingency would be $45,000**
  - **some 24% of the base estimate.**
  - **OK for first Gate but exceeds the boundaries for the second and third gates.**
- **So what would you do?**

RiskTools

Understand and manage your risk

Capital funding & Cash flow management

- Normally PMs hang on to any Contingency for as long as possible (just in case….).
  - Single project may not be a big issue but
  - over many projects a substantial amount of money may be held within projects that does not get released until each of them is completed.
- Easy and regular Contingency updating
  - the amount held within projects may be reduced much sooner than waiting until the end.
- Over a programme of projects can mean the release of some sizeable funds. Could then commit to (say) a new project or projects much earlier than would otherwise be the case.

RiskTools

Understand and manage your risk

Risk Management Requirements – Project Level

- Meeting Gatekeeping obligations (Risks and Budgets)
- Monthly reporting
- Monitoring/management of Treatment activities
- Prioritising work (eg High/Significant, Timeline for Treatments, risks with large financial impact)
- Once approved forecasting project end cost
- Also those risks that may impact next level of management (eg Programme)

RiskTools

Understand and manage your risk

Risk Management Requirements Programme/Portfolio level

- Specific Programme level risks (may be a separate part of RBS) such as:
  - Integration of projects in programme
  - Funding
  - Resources
  - Stakeholders
  - Communication
  - Timelines etc
- Specific risks of projects within programme:
  - Higher Management Attention (eg affecting programme objectives)
  - High/Significant risk in projects
  - Systemic risks across programme (through RBS filter eg Commercial)
  - Managing programme contingency

RiskTools

Understand and manage your risk

Risk Management requirements – Executive level

- Focus is on Governance:
  - Gatekeeping
  - Ongoing assurance that risk management is being undertaken
  - Management of cash and capital
- No surprises!

RiskTools

Understand and manage your risk

Efficiency

- Least amount of data that enables risk management
- Repeatable, visible processes
- Simple intuitive toolset for entering and updating data
- Visible risk and contingency with reports designed to support ongoing Risk Management
- Minimum formal reporting needed as information may be obtained by anyone (with access) at anytime and tailorable to achieve specific needs
- Cloud based solution so wider Project team (eg outside organisation) can see data.

RiskTools

Understand and manage your risk

Effectiveness

- Consistent approach – workshops and ongoing management
- Prioritisation of risks
  - Through risk analysis
  - Contingency outputs
- Integration
  - RBS
  - Objectives and risk through Management levels
  - Data may be uploaded to an Enterprise system (via a .csv file of User filtered data)
- Easy to use intuitive software
  - Saves time
- Visibility of risks and contingency
  - Stakeholder confidence
  - Improved assessment of capital requirements and cash flow management

RiskTools

Understand and manage your risk

Costs

- RiskOrganizer starts at $49 per month per User
- ContingencyEstimator start at $20 per month per User
- Cost per User drops as User numbers increase - $15 per month per User for both toolsets for 50 Users
- Real cost in project risk management is:
  - Inefficient processes which waste time (take too long, require rework, give incorrect results)
  - Cost of participants in workshops
  - Or
  - Not undertaking risk management!!!

RiskTools

Understand and manage your risk

Value

- You now have some thoughts on how you can get value from Project risk and Contingency Management.
- What about your situation? Is what has been outlined an improvement on what you are doing - ie is it:
  - More Efficient?
  - More Effective?
  - And at least cost?
- If your answer is yes then…..

RiskTools

Understand and manage your risk

Steps for you to consider

- Review the data you collect to manage risks
  - (is it really essential!)
- Throw away spreadsheets and get some purpose built software
- Document process
  - What, Why and How
- To help:
  - Leave your contact details
  - I will send you:
    - My eBook "Project Risk Management - A KISS approach"
    - Include you in Tip series
  - We would be happy to help so contact us (we will not chase you!)

RiskTools

Understand and manage your risk

Questions?

If questions arise later I may be contacted at:

Gavin.Halling@Risktools.com.au or +61 (0) 411 552 006

More information is also available from the website:

www.risktools.com.au

Thank you for your time.

RiskTools

Understand and manage your risk