



## ***A SIMPLE TOOL FOR RISK MANAGEMENT PLANNING***

### **INTRODUCTION**

Risk in a typical project is almost unavoidable; however it can be managed. Developing a comprehensive risk management plan is a critical step to assist in dealing with risk events that can affect your project.

Project teams and companies may avoid the subject of risk for a wide variety of reasons. Some feel that if a risk event is ignored, it may simply go away over time. In further cases, this may be true, but the result is more attributed to luck than to sound project management methodology. Others believe that you cannot manage what you do not know. On the contrary, listing all possible outcomes of a potential risk event in a project is smart and very critical to ensuring that a project will end as planned.

We live in an on-demand world where project timelines can be very tight. As project managers, we understand that the pressure to deliver results may mean the difference between remaining employed and being out on the street. Many project teams feel that they just do not have the time to develop a complete risk management plan. Our job as project managers is to convince the project team and management that we do not have the time to avoid risk planning. We must be convincing that our time is better spent in up front planning to identify and correct issues instead of spending more money and time later in the project correcting issues that 'unexpectedly' occur.

Over the years, I have had to persuade teams and managers alike that time spent on risk management plans are essential to project success. While working to achieve this task, I developed a risk management planning framework that was easy to setup and worked well in fast-paced environments.

### **SCOPE AND PURPOSE**

This paper covers a wide range of risk management terms and background that may seem repetitive to some more senior project managers. I added the additional information in an attempt to keep everyone on the same page and make no assumptions as to each reader's level of knowledge of risk management. The true heart of this paper is to ultimately arrive at and demonstrate a template that I use to categorize and prioritize risk impact to the project. The template works very well for those that feel they do not have the time to do a formal risk plan.

### **RISK PLAN TEMPLATE OBJECTIVES**

- Be able to overlay onto existing project open issues trackers and be able to assess the risk of each item
- Works well with existing project management methodologies and Project Management Offices (PMO's)
- Works well in a fast-paced environment -needs to be quick and easy to use
- Be objective in terms of risk quantification so that teams can agree on the total impact of the risk item identified with minimal debate
- Allows for multiple updates and revisions, remembering that risk management is an iterative process.
- Needs to have the capacity to identify all risks - NO RISK IS TOO SMALL TO MENTION!

### **RISK TYPES AND CATEGORIES**

There are three risk types – Risk Knowns, Risk Known-Unknowns and Risk Unknown-Unknowns. Each risk type is described below.

- *Risk Knowns*  
Risk knowns are the easiest to understand and quantify. A risk known is exactly what it says – we know it. An example would be a tight schedule for a project with a limited number of resources. If we know that the holidays are coming up and several of the team members are planning to take vacation, we have identified a risk-known that we will not have enough people on the project to meet the tight schedule. This type of risk and situation is easy to identify and quantify the potential impact. These risk types must be identified on a project because we know they will happen with absolute certainty.
- *Risk Known-Unknowns*  
Risk Known-Unknowns fall into the middle of the pack in terms of our ability to quantify them. These types of risks are fairly easy to identify, but tougher to fully quantify the impact to the project. An example of a Risk Known-Unknown would be a dinner reservation for you and your family next week. We know that we are going to dinner and maybe even what type of food we will order, but in this case we cannot definitively identify what we will be eating or what the cost will be. These types of risks are identified, and using the judgment of the team and client, possible scenarios and outcomes are agreed upon and planned for. In cases like these, contingency budgets may need to be put in place to cover the range of possible outcomes for the risk identified.
- *Risk Unknown-Unknowns*  
Risk Unknown-Unknowns are the most ambiguous since we do not know what we do not know. An example of an Unknown-Unknown would be if a tornado came and destroyed a warehouse full of product inventory. In this example, the area hit was not believed to be prone to tornadoes so there is no way that anyone would expect or be able to predict or plan for it happening. The risk event was never identified or able to be forecasted. Risks and situations like these are impossible to plan for and must be dealt with in the hopefully unlikely situation that they ever occur. If the area struck is considered a high risk for bad weather such as tornadoes, then the risk situation may be labeled as a risk known-unknown as described above.

Within each risk type, there can be several risk categories. PMBOK describes the risk categories as follows:

- Technical, quality or performance risks
- Project management risks
- Organizational risks
- External risks

Each of these risk categories should be reviewed for each project with the project manager and project team. The goal is to develop the most comprehensive listing of possible risk events with the timeframe available on the project.

### RISK CONSIDERATIONS

The following questions are examples that the project manager and team can ask about the project plan to develop the risk events for the risk plan. Note that a complete list of all possible risk events does not exist, so the team has to provide input based on history, experience, similar projects, interviews, and brainstorming.

1. Have you built in backup dates to accommodate slippage of schedule?
2. Have you estimated the duration of activities against proven standards or benchmarks?
3. Has a critical path been established?
4. Have the dates for availability of equipment and resources from all vendors been accounted for?
5. Have all documentation activity sequences been identified?
6. Have all milestones been identified?
7. Have all operational activity sequences been identified?
8. Have all quality control points been identified?
9. Have all review dates been identified?
10. Have all training activity sequences been identified?
11. Have critical equipment requirement dates been established?
12. Have critical material requirement dates been established?
13. Have deliverable dates been identified?
14. Have all hardware infrastructure issues, such as interoperability and portability, been identified?
15. Have indirect cost estimates been identified?
16. Have operational cost estimates been identified?
17. Have team skills been identified by roles?
18. Have necessary team skills been identified as available to the project?
19. Have all software infrastructure issues, such as configuration and compatibility, been identified?
20. Have status report dates been identified?
21. Etc.

### RISK PLAN TERMINOLOGY\*

**Risk Event** – An uncertain event or condition that, if occurs, has a positive or negative effect on a project's objectives.

**Risk Identification** - Determining which risk events are likely to affect the project.

**Risk Management Plan** - Documents how the risk processes will be carried out during the project.

**Risk Quantification** - Evaluating the probability of risk event occurrence and effect.

**Risk Response Control** - Responding to changes in risk over the course of the project.

**Risk Response Development** - Defining enhancement steps for opportunities and mitigation steps for threats.

*\*taken from the 2000 Edition, A Guide to the Project Management Body of Knowledge (PMBOK Guide)*



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### **INFORMATION NEEDED**

Several pieces of project information should be gathered in order to complete the risk events table.

*Project open issues list/risk events listing* – One of the goals of this risk plan was to be able to use existing tools and have it work well with minimal time available. Just about every project that I have managed over the years began with some form of open issues list of which is where the process can begin. The premise behind starting here is that each open issue that is not addressed on a project has the potential to affect the project in undesirable ways. If an open issues list does not exist for the project, then the process can begin at the Risk Plan Kickoff meeting.

*Risk Plan Kickoff meeting* - the project team should be assembled to brainstorm all possible risk events for the project. Review the risk considerations section above for areas in the project plan that needs to be considered. Ultimately, the more stakeholders involved the more comprehensive the risk plan outcome will be. In some cases, not all stakeholders (including the client and third party vendors) can be present. In this case, make attempts to be sure that the core project team is together. The core project team is the group of team members that will spend the majority of the time on the project. The project manager may elect to describe his or her risk concerns before the meeting is held to set a direction for the risk discussion.

*Risk Event/Severity Table* - Once the list of risks and open issues are tabulated, they should be entered into the Risk Event Column in a severity table similar to that shown in Figure 1 below. Spreadsheets work well for items such as this as they can be sorted and calculations can be automatically placed into columns to sum up risk quantification numbers.

Please note that the spreadsheet example shown in Figure 1 is shown with completed risk calculations. These calculations will be discussed in the next two sections.

**Figure 1 - Severity Table (example)**

#	RISK EVENT	DATE OPENED	R <sub>p</sub>	R <sub>t</sub>	R <sub>c</sub>	R <sub>s</sub>	Risk impact	Risk Ranking High/Med/Low
1	Back end connections – delivery delays	5/26/03	3	1	1	9	3.6	Medium
2	Budget constraints	5/26/03	9	3	9	1	7	High
3	Outages at each phase to ramp up to each new user level	5/26/03	9	3	1	1	1.6	Medium
4	Schedule demand / resource overload -55 hour work week	6/26/03	9	1	9	9	6.3	High
5	Shared risk between equipment arrival and Board of Director Approval	5/26/03	9	1	1	9	3.6	Medium
6	Fail over/ stress testing of production environment	5/26/03	9	3	3	3	3	Medium
7	Lack of formal disaster recovery plan (DR)	5/26/03	9	3	9	1	4.3	Medium
8	Accelerated equipment delivery date	5/26/03	9	1	1	3	1.6	Medium
9	Development and Test are different OS environments than Production and Stage Project Schedule has no slack	7/11/03	9	1	3	9	4.3	Medium-high
10	Holiday schedules for personnel	7/11/03	9	1	3	9	4.3	Medium-high

**RISK ASSESSMENT CALCULATION**

The Risk Assessment Calculation is a formula that assesses both the complexities of the change as well as other empirical factors. The requestor is asked to rank three categories of expected risk impact against the expected probability of the event occurring. The rankings are each done using a “1-3-9” (low-medium-high) scale or a “1-10” scale. Examples of each option are shown below in Figure 2A and Figure 2B. Some teams may feel more comfortable using the simpler 1-3-9 method for deciding on the probability of occurrence.

<b>Figure 2A - Probability of Occurrence (1-3-9)</b>	
<b>1</b>	Low probability – possible but not likely
<b>3</b>	Medium probability – 50/50 chance that the event might occur
<b>9</b>	High probability – 80%+ chance that the event will occur

A quantifiable risk amount is determined using the following equation.

Risk impact = {R<sub>p</sub>, (R<sub>t</sub> + R<sub>c</sub> + R<sub>s</sub>) / 3}. These two numbers are then charted on an X and Y-axis similar to Figure 4 to determine the overall level of risk for the risk event in question. Depending

on which quadrant the values land will determine the overall level of risk to the project.

The formula looks a little more complicated than it really is. In the end, there are essentially just two numbers – one for the X coordinate and one for the Y coordinate and their derivation is described in more detail in the sections below.

### RISK CALCULATION DETAILS

*Probability (R<sub>p</sub>) – What is the likelihood of the risk event occurring?*

The **probability** of the risk event occurring is denoted as R<sub>p</sub>. This probability factor is graphed on the Y axis against the risk impact factor on the X axis (shown later in this text). During the risk plan kickoff meeting the project team needs to agree on the likelihood of the listed event occurring. Figure 2A and 2B denote two sets of recommended values that can be used to agree on the risk event probability. These numbers determine which quadrant the risk event will land when it is graphed as demonstrated in Figure 4. Either table works since the goal is to make the rankings as objective as possible and eliminate any ambiguity which can slow the meeting down when trying to agree on a risk probability value. While the percent confidence in the event occurring can still be considered subjective, having a good cross-section of team members using consensus voting eliminates this problem.

<i>Figure 2B - Probability of Occurrence (R<sub>p</sub>)</i>	
<b>0, 1, 2</b>	0 - 20% Confident the event will occur
<b>3, 4</b>	30 - 40% Confident the event will occur
<b>5, 6</b>	50 - 60% Confident the event will occur
<b>7, 8</b>	70 - 80% Confident the event will occur
<b>9, 10</b>	90 - 100% Confident the event will occur

*Risk Impact - What is the gain or loss if the event occurs?*

The risk **impact** computation is more involved than the risk probability. For starters, a calculation is required to develop the risk impact. Second, the impact of risk is broken into three categories. Each category shows the magnitude of impact due to technical factors, cost and schedule. Like the risk probability number, R<sub>p</sub>, the project team will have to agree on the value for each risk event for each risk impact category below.

$$\text{Risk Impact} = ((R_t + R_c + R_s) / 3)$$

Where,

- R<sub>t</sub> = Technical Impact (1-3-9) or (1-10)
- R<sub>c</sub> = Cost Impact (1-3-9) or (1-10)
- R<sub>s</sub> = Schedule Impact (1-3-9) or (1-10)

As with the Risk probability factor, Figures 3A and 3B are listed to help in determining what magnitude each factor should receive. It should be apparent at this point why a spreadsheet is useful for tabulating the results of the risk planning meeting. The formula is easy to code into the sheet and input from the team on each risk probability and impact can be entered readily to produce the overall risk ranking

**Figure 3A - IMPACT TABLE (1-3-9)**

Magnitude	Technical Impact (R <sub>t</sub> )	Cost Factor (R <sub>c</sub> )	Schedule Factor (R <sub>s</sub> )
<b>1</b>	Minimal or no consequence, unimportant to small reduction in technical performance	Budget estimates not exceeded, some transfer of money to cost estimates exceeded 1 to 5 percent	Negligible impact on program – offset by available slack to minor slip in schedule (less than 1 week) – milestones may adjust
<b>3</b>	Some to significant reduction in technical performance	Cost estimates increased by 5 to 30 percent	Small slip in schedule (1-2 weeks) to development schedule slip in excess of 3 weeks
<b>9</b>	Cannot meet technical goals	Cost estimates increased in excess of 30 percent	Large schedule slip that affects segment milestones or has effect on system milestones (> 1month)

**FIGURE 3B - IMPACT TABLE (1-10)**

Magnitude	Technical Impact (R <sub>t</sub> )	Cost Factor (R <sub>c</sub> )	Schedule Factor (R <sub>s</sub> )
<b>0 – 2</b>	Minimal or no consequence, unimportant	Budget estimates not exceeded, some transfer of money	Negligible impact on program – offset by available slack
<b>3 – 4</b>	Small reduction in technical performance	Cost estimates exceeded 1 to 5 percent	Minor slip in schedule (less than 1 week) – milestones may adjust
<b>5 – 6</b>	Some reduction in technical performance	Cost estimates increased by 5 to 10 percent	Small slip in schedule (1-2 weeks)
<b>7 – 8</b>	Significant degradation in technical performance	Cost estimates increased by 10 to 30 percent	Development schedule slip in excess of 3 weeks
<b>9 – 10</b>	Cannot meet technical goals	Cost estimates increased in excess of 30 percent	Large schedule slip that affects segment milestones or has effect on system milestones (> 1month)

### **RISK THRESHOLD / RISK MANAGEMENT POLICY**

Each project, project team and company will have a different level of tolerance for risk. Some companies are more risk averse than others and understanding this will help establish the response strategy for each risk calculation. Additionally, the risk threshold creates the risk levels for each quadrant in Figure 4.

The severity table (Figure 1) can be used to track and record each risk event, the agreed upon risk factors and the risk calculation. Using Figure 4, the current risk status in terms of

color and level (*green* – no risk or low probability of occurrence, *orange* – risk plan in place, risk exists but is under control, *red* – high risk probability, need special attention to develop resolution) can be entered into Figure 1.

If contingency plans are required (based on the risk ranking), and once the plan is developed and in place, the risk can be recalculated to be certain that it is contained below an acceptable threshold. Risk management is an iterative process and can require several revisions due to changes in the project's scope, team, schedule, environment and many other factors. An acceptable risk threshold is one that the project team (including the customer) feels comfortable with and that coincides with the company's risk management policy and risk threshold tolerance. Each risk level can be adjusted according to these policies.

### RISK PRIORITY AND CLOSEOUT

During the course of a project, teams and managers alike are assigned a great deal of work. Doing the right work each day is critical to keeping a project moving forward. Project schedules are easy to identify as to the next task but how about the next project risk? Figure 5 is a great means to prioritize the project risk so the project team can focus on a manageable amount of tasks and not become overwhelmed. Depending on the skill and size of the team, the project manager can assign as many risk plans to the team that he or she feels they can handle.

With Figure 5 completed, it is time to create risk plans using the risk response strategies below.

### RISK RESPONSE STRATEGIES

There are four basic risk response strategies:

1. **Avoidance:** Change the project plan to eliminate the risk or condition or to protect the project objectives its impact.
2. **Transference:** Shift the consequences of the risk to another party
3. **Mitigation:** Reduce the probability and/or consequences of the risk to an acceptable level.
4. **Acceptance:** Allow the risk or condition to remain, but have a contingency plan to execute, should the risk occur.

Again, the project team, a company's tolerance for risk and the risk situation will determine which response strategy is chosen.

### RISK PLAN VARIATIONS

As teams become more comfortable with risk management, they can elect to rank the importance of one risk impact over another. If it is believed that risk due to a schedule,  $R_s$  is twice as important as those due to technical or cost, then the risk impact formula lays out as shown.

$$\text{Risk Impact} = ((R_t + R_c + 2R_s) / 4)$$

Where,

$R_t$  = Technical Impact (1-3-9) or (1-10)

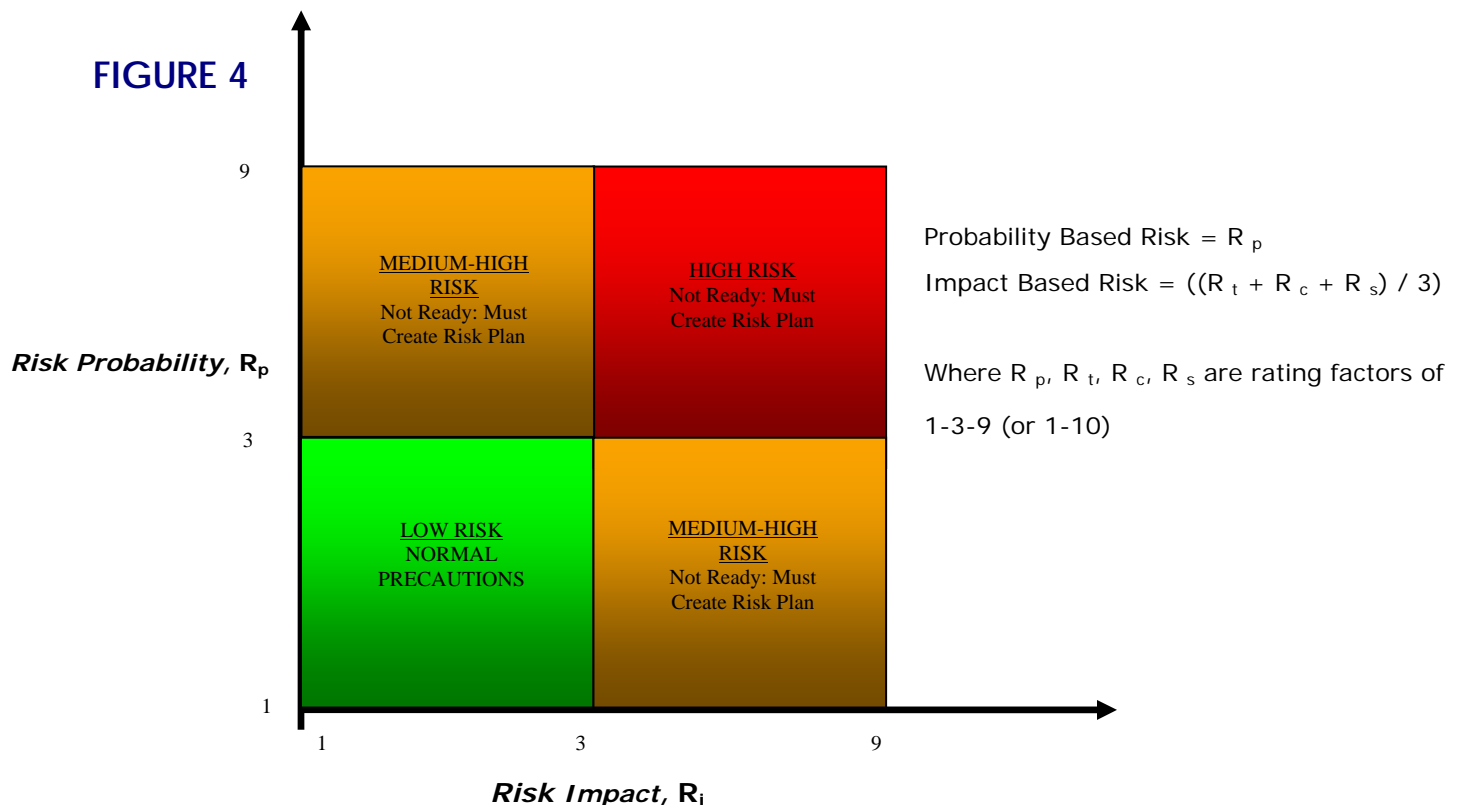
$R_c$  = Cost Impact (1-3-9) or (1-10)

$R_s$  = Schedule Impact (1-3-9) or (1-10)

Note that the denominator needs to be increased from 3 to 4 in this case to equal the 4 risk factors identified in the numerator. The numerator and denominator must always remain equal for this calculation to work.

### CONCLUSION

Having used this risk management overlay template personally on several projects, I can attest to its ease and usefulness along with its ability to develop risk plans quickly. Each project manager and team should be able to understand the basics of risk management as described above, however they do not have to be experts in the calculations. The main point of all of this is that risk plans on projects need to be developed whether we believe we have the time or not. This template will hopefully help facilitate this task.



***Figure 5 - Contingency Table (ranked from high to low risk)***

<b>#</b>	<b>RISK EVENT</b>	<b>Risk impact</b>	<b>High/Med/Low</b>	<b>OWNER</b>
2	Budget constraints	7	High	Customer
4	Schedule demand / resource overload -55 hour work week	6.3	High	Sam
9	Development and Test are different OS environments than Production and Stage Project Schedule has no slack	4.3	Medium-High	Jim
10	Holiday schedules for personnel	4.3	Medium-High	Project Manager
7	Lack of formal disaster recovery plan (DR)	4.3	Medium	Sales
5	Shared risk between equipment arrival and Board of Director Approval	3.6	Medium	John
1	Back end connections – delivery delays	3.6	Medium	Project Manager
6	Fail over/ stress testing of production environment	3	Medium	Project Manager
8	Accelerated equipment delivery date	1.6	Medium	Procurement
3	Outages at each phase to ramp up to each new user level	1.6	Medium	Team