

# Developing a Risk Management Plan

Developing an effective Risk Management Plan is an important part of any project. Unfortunately, this step is often avoided with the "deal with it later" attitude. If everything goes smoothly and without incident, that approach does no harm. But normally, issues do arise and without a well developed plan, even small issues can become emergencies.

There are different types of Risk Management and different uses. In this document we will look at Risk Management from the standpoint of planning for adverse events.

## Steps

1. **Understand how Risk Management works.** Risk is the effect (positive or negative) of an event. It is computed from the probability of the event materializing (becoming an issue) and the impact it would have (**Risk = Probability X Impact**). Various factors should be identified in order to analyze risk, including:
  - o **Event:** What could happen?
  - o **Probability:** How likely is it to happen?
  - o **Impact:** How bad will it be if it happens?
  - o **Mitigation:** How can you reduce the Probability (and by how much)?
  - o **Contingency:** How can you reduce the Impact (and by how much)?
  - o **Reduction = Mitigation X Contingency**
  - o **Exposure = Risk – Reduction**
    - After you identify the above, the result will be what's called Exposure – that's the amount of risk you simply can't avoid. Exposure may also be referred to as Threat, Liability, Severity or other names but they pretty much mean the same thing. It will be used to help determine if the planned activity should take place.
    - Often this is a simple cost vs. benefits formula. You might use these elements to determine if the risk of implementing the change is higher, or lower, than the risk of not implementing the change.
  - o **Assumed Risk** If you decide to proceed (sometimes there is no choice, e.g. federally mandated changes) then your Exposure becomes what is known as Assumed Risk. In some environments, Assumed Risk is reduced to a dollar value which is then used to calculate the profitability of the end product.
2. **Define your project.** In this article, let's pretend you are responsible for a [computer system](#) that provides important (but not life-critical) information to some large population. The main computer on which this system resides is old and needs to be replaced. Your task is to develop a Risk Management Plan for the migration. This will be a simplified model where Risk and Impact are listed as High, Medium or Low (that is very common especially in Project Management).
3. **Get input from others.** [Brainstorm](#) on risks. Get several people together that are familiar with the project and ask for input on what could happen, how to help prevent it, and what to do if it does happen. Take a *lot* of notes! You will use the output of this very important session several times during the following steps. Try to keep an open mind about ideas.

"Out of the box" thinking is good, but do keep control of the session. It needs to stay focused and on target.

4. **Identify the consequences of each risk.** From your brainstorming session, you gathered information about what would happen if risks materialized. Associate each risk with the consequences arrived at during that session. Be as specific as possible with each one. "Project Delay" is not as desirable as "Project will be delayed by 13 days." If there is a dollar value, list it; just saying "Over Budget" is too general.
5. **Eliminate irrelevant issues.** If you're moving, for example, a car dealership's computer system, then threats such as nuclear war, plague pandemic or killer asteroids are pretty much things that will disrupt the project. There's nothing you can do to plan for them or to lessen the impact. You might keep them in mind, but don't put that kind of thing on your risk plan (OK, if you're working for the United Nations, maybe).
6. **List all identified risk elements.** You don't need to put them in any order just yet. Just list them one-by-one.
7. **Assign probability.** For each risk element on your list, determine if the likelihood of it actually materializing is High, Medium or Low. If you absolutely have to use numbers, then figure Probability on a scale from 0.00 to 1.00. 0.01 to 0.33 = Low, 0.34 to 0.66 = Medium, 0.67 to 1.00 = High.
  - o Note: If the probability of an event occurring is ZERO, then it will be removed from consideration. There's no reason to consider things that simply cannot happen (enraged T-Rex eats the computer).

H	High	Exhibits the high risk cue(s), has happened frequently, has a very significant chance of happening in the future, or for a single event has already happened.
M	Medium	Has happened occasionally or has a reasonable but not completely expected chance of happening in the future
L	Low	Has happened very infrequently or is expected not to happen except infrequently.
NA	Not Applicable	This risk is irrelevant to this project or operation.
NI	Need Information	Impossible to determine probability with the current available information. Information must come from an outside source. Consider High probability until otherwise identified.
TBD	To Be Determined	Additional study will be required. Consider High probability until otherwise identified.

Table 1

8. **Assign impact.** In general, assign Impact as High, Medium or Low based on some pre-established guidelines. If you absolutely have to use numbers, then figure Impact on a scale from 0.00 to 1.00 as follows: 0.01 to 0.33 = Low, 0.34 – 066 = Medium, 0.67 – 1.00 = High.
  - o Note: If the impact of an event is ZERO, it should not be listed. There's no reason to consider things that are irrelevant, regardless of the probability (my dog ate dinner).

Impact - What will happen if the risk becomes an issue		
H	High	The issue will have a major impact on the system and is likely to cause significant disruption in service; a very visible event.
M	Medium	The issue will have some impact on systems and be visible to a number of users. A possible disruption in service for some non-critical users is expected.
L	Low	No service disruption or negative effects are expected. Any negative impact can be corrected without significant effort or visibility.
NA	Not Applicable	This risk is irrelevant to this project or operation.
NI	Need Information	Impossible to determine probability with the current available information. Information must come from an outside source. Consider High impact until otherwise identified.
TBD	To Be Determined	Additional study will be required. Consider High impact until otherwise identified.

Table 2

9. **Determine risk for the element.** Often, a table is used for this. If you have used the Low, Medium, High values for Probability and Impact, the top table is most useful. If you have used numeric values, you will need to consider a bit more complex rating system similar to the second table here. It is important to note that there is no universal formula for combining Probability and Impact; that will vary between people, and between projects. This is only an example (albeit a real-life one):

Function (Probability, Impact)							TBD and NI combinations produce a higher than normal severity because if the probability or impact is not clearly known, it is assumed that the other variable may also be subject to change.
		Probability					
		L	M	H	NI	TBD	NA
Impact	H	M	H	H	H	H	NA
	M	L	M	M	H	H	NA
	L	L	L	L	M	M	NA
	NA	NA	NA	NA	NA	NA	NA
	NI	M	H	H	H	H	NA
	TBD	M	H	H	H	H	NA

  

(Probability * Impact) ^ 0.4425							TBD and NI combinations produce a higher than normal severity because if the probability or impact is not clearly known, it is assumed that the other variable may also be subject to change.
		Probability					
		0.2	0.5	0.8	0.9	0.9	0
Impact	0.8	0.444	0.667	0.600	0.665	0.665	0
	0.5	0.333	0.540	0.666	0.700	0.700	0
	0.2	0.200	0.200	0.200	0.470	0.470	0
	0	0	0	0	0	0	0
	0.9	0.470	0.700	0.650	0.900	0.900	0
	0.9	0.470	0.700	0.650	0.900	0.900	0

Table 3 at top, Table 4 at bottom

- o **Be flexible in analysis.** Sometimes it may be appropriate to switch back and forth between the L-M-H designations and numeric designations. You might use a table similar to the one here:

To change LMH to a number		To change a number to LMH		
Risk	Rating	Risk	Rating	
H	0.8	0.1	L	
M	0.5	0.2	L	
L	0.2	0.3	L	
NA	0	0.4	M	Division at 1/3
NI	0.9	0.5	M	
TBD	0.9	0.6	M	Division at 2/3
		0.7	H	
		0.8	H	
		0.9	H	

Table 5

10. **Rank the risks:** List all the elements you have identified from the highest risk to the lowest risk.

Risk	Consequence	Probability	Impact	Severity
risk 1	consequence 1	H	H	H
risk 2	consequence 2	M	H	H
risk 3	consequence 3	H	M	M
risk 4	consequence 4	M	M	M
risk 5	consequence 5	L	M	M
risk 6	consequence 6	M	L	L
risk 7	consequence 7	L	L	L

Table 6

11. **Compute the total risk:** Here is where numbers will help you. In Table 6 you have 7 risks assigned as H, H, M, M, M, L, and L which can translate to 0.8, 0.8, 0.5, 0.5, 0.5, 0.2 and 0.2, from Table 5. The average of the total risk is then 0.5 which translates to Medium.
12. **Develop mitigation strategies.** Mitigation is designed to reduce the probability that a risk will materialize. Normally you will only do this for High and Medium elements. You might want to mitigate low risk items but certainly address the other ones first. For example, if one of your risk elements is that there could be a delay in delivery of critical parts, you might mitigate the risk by ordering early in the project.
13. **Develop contingency plans.** Contingency is designed to reduce the impact if a risk does materialize. Again, you will usually only develop contingencies for High and Medium elements. For example, if the critical parts you need do not arrive on time, you might have to use old, existing parts while you're waiting for the new ones.
14. **Analyze the effectiveness of strategies.** How much have you reduced the Probability and Impact? Evaluate your Contingency and Mitigation strategies and reassign Effective Ratings to your risks.

Risk	Consequence	Probability	Effective Probability	Impact	Effective Impact	Severity	Effective Severity
risk 1	consequence 1	H	M	H	M	H	M
risk 2	consequence 2	M	M	H	M	H	M
risk 3	consequence 3	H	M	M	L	M	M
risk 4	consequence 4	M	L	M	L	M	L
risk 5	consequence 5	L	L	M	L	M	L
risk 6	consequence 6	M	L	L	L	L	L
risk 7	consequence 7	L	L	L	L	L	L

Table 7

15. **Compute your effective risk.** Now your 7 risks are M, M, M, L, L, L and L, which translate to 0.5, 0.5, 0.5, 0.2, 0.2, 0.2 and 0.2 which gives an average risk of 0.329. Looking at Table 5 we see that the overall risk is now categorized as Low. **Originally the Risk was Medium (0.5). After management strategies have been added, your Exposure is Low (0.329). That means you have achieved a 34.2% reduction in Risk through Mitigation and Contingency; Not bad!**
16. **Monitor your risks.** Now that you know what your risks are, you need to determine how you'll know if they materialize so you'll know when and if you should put your contingencies in place. This is done by identifying Risk Cues. Do this for each one of your High and Medium risk elements. Then, as your project progresses, you will be able to determine if a risk element has become an issue. If you don't know these cues, it is very possible a risk could silently materialize and affect the project, even if you have good contingencies in place.

Risk and Cue Examples			
Risk Factor	Low Risk Cues	Medium Risk Cues	High Risk Cues
Data Migration	Minimal data or the migration is straightforward and simple	Sufficient amounts of data, but good definitions exist	Much data exists, multiple types of data, data difficult to locate or access
Disaster Recovery	Good disaster recovery plans are in place, well documented and people know their recovery procedures	Disaster recovery is in conceptual phase. It has been considered, but procedures are not well developed, or are not well known	No disaster recovery plans are in place, no backup systems are available, no plans or consideration of disaster-related events
Installation difficulty	Installation will be easy. Documentation is clear and well distributed	Installation will be difficult but support personnel are available locally or easily from the vendor	Installation will be very complex, or support personnel may be unavailable. Vendor resources may be unavailable

Table 8

## Tips

- Plan for change. Risk Management is a fluid process because risks are always changing. Today, you might assign some risk with a high probability and a high impact. Tomorrow, the probability or the impact might change. Also, some risks might drop completely off the table while others come into play.
- Always investigate. What have you missed? What things could happen that you haven't yet considered? This is one of the hardest things to do and one of the most critical. Make a list and check it repeatedly.
- Use a spreadsheet to keep track of the risk plan on an ongoing basis. Risks change, old risks may disappear and new risks will come into focus.
- Part of a good contingency plan is an early warning signal. If there is a test result that will tell you if you need to adopt your contingency plan, make sure you expedite those test results. If there isn't a good warning signal, try to design one.
- You can use Exposure to help determine if you want to actually do the project. If the total project estimate is \$1,000,000 and your Exposure is 0.329, the general rule is you have a \$329,000 potential over the estimate. Can you budget the extra money... just in case? If not, you might want to reconsider the scope of the project.
- Reduction = Risk – Exposure. In this example (and assuming a \$1,000,000 project estimate) your Risk is 0.5 X \$1,000,000 (\$500,000) and your Exposure is 0.329 X \$1,000,000 (\$329,000) which means the value of your Reduction = \$171,000. Use that as an indication of how much you can reasonably spend on managing the risks – that should be a part of the revised project estimate (like Insurance).
- In situations where the Project Manager may become overloaded with the Risk Management function, the analysis could be limited to the project's critical path. In that event it is advisable to calculate multiple critical paths with, perhaps, additional lag time to more proactively identify tasks that are likely to land on the critical path. *This is*

*especially appropriate when a single PM is controlling multiple projects. Risk Management needs to be considered as a part of the project, but not overshadow the other planning and control functions (see Warnings).*

- If you are an inexperienced project manager, or the project is small, consider saving time by skipping steps that either do not apply or have little impact on the project; bypass the formal Probability and Impact assessment, do the "mental math" and jump immediately to looking at Severity. For example, if you need to do maintenance on an electrical circuit and that activity *will* bring down a server, is it "riskier" to move the server to a new circuit before the maintenance or wait until the maintenance is finished to bring the machine back online. In either event, the server is coming down - but you can just identify which activity poses the lowest risk for the project.

## Warnings

- Don't get too intricate for the project. Risk Management is an important part of the project but it shouldn't overshadow the actual work to be done. If you're not careful about this, you can start chasing irrelevant risks and overload your plan with useless information.
- Do not ignore Low risk items completely, but don't spend much time with them. Use High, Medium and Low to indicate how much effort you will put into monitoring each risk.
- Do not assume you have all the risks identified. The nature of risk is that it is unpredictable.
- Do **not** let politics interfere with your assessment. This happens a lot. People don't want to believe things they control could go wrong and will often fight you about risk levels. "Oh that could never happen" could be true, but then again it might be someone's ego talking.
- Consider what might happen if two or three things go wrong at the same time. The probability will be very low, but the impact can be extreme. Nearly every major disaster involved multiple failures.