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Managing Risk – An Integrated Approach

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Introduction

When, and how, should a project manager address risk? The short answer is: all the time, and in every conceivable way. This paper takes a more extensive look at the question and provides multiple answers. Project managers can and should address risk management in coordination with all the other project management processes. They must also be proactive in handling risk, as opposed to being reactive, when it may be more costly in terms of time and money.

Too often project managers avoid risk management by thinking that it is too difficult and/or too unfamiliar to them. This is negligent, dangerous, and erroneous thinking. Project managers need to realize that risk management is easy, straightforward, and necessary. If you already follow PMI's methodology, risk management is simply an extension of all other project management activities (time, cost and scope management, etc.). While all the processes are closely integrated, risk is perhaps the most closely integrated to all other processes. Remember this concept as you begin to understand how risk relates to everything else you do in project management.

Risk management planning can and should be performed while you are planning all the other processes. During this time, it is easiest to identify potential sources of risk. Risk monitoring and controlling should be performed as you are monitoring and controlling all of the other processes. During this time, you will need to reassess and rethink your risk plans. Revisions to the risk plan may be necessary because of planned or unplanned changes in other processes.

Risk Management Is Easy

The *Project Management Body of Knowledge (PMBOK®)*, 4th Edition, describes risk as "an uncertain event or condition that, if it occurs, has an effect on at least one project objective." Risk always happens in the future, so you're probably thinking, "If only I could see the future, I could easily protect the scope, time, cost, and quality of my projects." It isn't quite that easy, but you can anticipate and plan for what might happen in the future if you do due diligence in understanding the processes for managing risk.

PMBOK® provides guidance for managing risk. Simply follow the six risk management processes.

- Plan Risk Management
- Identify Risks
- Perform Qualitative Risk Analysis

- Perform Quantitative Risk Analysis
- Plan Risk Responses
- Monitor and Control Risks

For Plan Risk Management, begin by researching your organization's risk management policies and procedures. If you don't find any, your company probably does not have a formal risk management strategy. And, if you don't have a Project Management Office (PMO) that can provide guidance, then you must develop the risk management strategy for your projects. When you plan risk management, you, the project team, and key stakeholders determine the approach for handling risks.

Use planning-meetings and analysis to decide not only how to handle risks, but also make key decisions about many risk topics. Part of the discussion should include the risk attitudes that will be used: whether you will be risk-tolerant, risk-averse, or risk-neutral. You must also understand the differences between positive and negative risks, and determine how you will handle each type of risk. During these meetings, you must also decide how the two, key risk terms, probability and impact, will be determined, calculated, and addressed. The primary output of risk management planning is the risk management plan, which is one of the many subsets of the project management plan.

Another part of risk management planning includes discussions of how costs and schedules may be impacted by risk, and what buffers or reserves should be created to handle variances to cost or time. The project manager must add contingency reserves to both the schedule and the budget to handle anticipated risks, known unknowns, and those that you can identify and list. Management reserves must be allocated for the unknown unknowns, the risks that you weren't able to anticipate. During risk management planning, discuss management reserves with your project sponsor and decide upon guidelines for estimating, receiving, and using such reserves, when needed.

Risk Management Is Straightforward

The first five risk management processes occur during the planning stages of the project. Figure 1 shows how closely these risk processes are linked to other planning processes. Every bolded item represents a potential source of risk. So, as you identify risks, simply work through each of the other processes and the bolded items. Remember to think of positive, as well as, negative risks. In other words, for each process and bolded item, consider what could go better than expected and what could go worse than expected. Then, you have initially identified the positive and negative risks.

Planning	
Develop PM plan	Plan risk management
Collect requirements	Identify risks
Define scope	
Create the WBS	
Define activities	
Sequence activities	
Estimate activity resources	Perform qualitative risk analysis
Develop schedule	Perform quantitative risk analysis
Estimate costs	
Determine budget	
Plan quality	Plan risk responses
Develop HR plan	
Plan communications	
Plan procurements	

Figure 1

Identify Risks

In Figure 1, you notice several obvious sources of risk. Begin to list possible risks on your risk list or risk register. Start with the requirements and scope for the project. If/when these change, the opportunity for risk increases. The Work Breakdown Structure (WBS) is another obvious source of risk. Analyze which deliverables and/or activities may have associated risks, and consider potential risks for deliverables and activities that might have been inadvertently omitted. Project resources are another prime source of risk, so you must consider issues related to resources. Cost, availability, delivery, quality, and expertise are only some of the items to consider when identifying risks associated with resources.

Costs and budgets provide another excellent opportunity for adding potential risks to your risk register. What if the costs of the project exceed those expected, or the money allotted for the project is reduced? You must anticipate how those events could impact your project. The desire of the sponsor or organization for a specific level of quality also provides additional opportunities for identifying potential risks. Does your organization have quality processes in place? Or, is this yet another new area you must address for your projects?

What could go right, or wrong, with communications planning and/or procurement? Answering this question will enable you to further add risks to your risk register. And last, but not least, remember to consider risks related to managing the project. Your estimates for cost, duration, resources and all other components are additional sources for risk. Simply use the chart provided to begin to develop the risk register, and identify the characteristics and possible triggers, or symptoms, for each identified risk.

The next two processes are just as straightforward but may require a bit more time and, perhaps, some assistance from subject matter or risk experts.

Perform Qualitative Risk Analysis

Following risk identification is qualitative risk analysis. This means that the project manager, the team, and key stakeholders will look at the probability and impact of each risk that has been entered on the risk register. Probability is defined as the likelihood that the uncertain event will occur. Impact is the consequences to the project, generally in terms of cost or time, if the event occurs. The way that both will be addressed - by percentages, levels, color codes, etc., - should have been determined during risk management planning. As a group, the team will subjectively, but without bias, attempt to rank each risk on these two criteria.

The probability and impact of each risk will be determined through meetings and discussions by the project manager, stakeholders and, perhaps, unbiased risk experts or subject matter experts. Then, a risk score is calculated by multiplying the probability by the impact to derive a risk score. The risk score then enables you to rank each risk in comparison to other risks on the register. Before sorting the risk register from highest to lowest, be sure to separate positive risks from negative risks. Your goal is to maximize the positive risks (opportunities) and minimize the negative risks (threats).

Once the risks have been sorted, the risks in the upper portions of the risk register are those deemed highest priority. During risk management planning, the team should have determined the threshold above which to continue analysis of risks for quantitative analysis.

Perform Quantitative Analysis.

Of all the risk processes, this is the one that may be the most difficult, depending upon the level of mathematical analysis you choose to perform. The goal is to determine the expected monetary value (EMV) of each high-priority risk. The benefit of this is to anticipate the cost of the risk in terms of lost/saved time or money. Generally, you perform quantitative risk analysis only on those risks now residing above the threshold on the risk register.

Once again, you may need to include subject matter or risk experts in the discussion of the value of the impact of each risk. Do this to dilute any biases that team members may have about particular risks. To derive the EMV, use the formula listed below.

$$\text{EMV} = \text{Probability} \times \text{Value of the impact}$$

The value of the impact is what you expect the loss, or gain, to be if a particular risk occurs. The probability, as previously defined, is the likelihood that the event will occur. So, if the probability of a new server not being large enough for the development project is 20%, and the value of the impact is \$60,000, the EMV for this event would be calculated as shown below.

$$\text{EMV} = .20 \times \$60,000$$

$$\text{EMV} = \$12,000$$

What does that tell you? If the new server is inadequate, the cost of the risk is \$12,000, meaning that you could add this amount, or some portion of it, to your contingency reserve. By doing similar calculations for each high-priority risk, you will be able to estimate the amount of money to be considered for the contingency reserve. The same calculations work for time, allowing you to add contingencies to the schedule, as well as to the cost estimates.

There are many other techniques that could be used for quantitative risk analysis. Some, such as using simulation software like Monte Carlo, standard deviations or distribution charts may require additional expertise. Industry experts and/or risk experts may be consulted for these and other techniques.

When you finish calculating the EMV of each high-priority risk, once again, you will re-sort the list of risks and move risks that have been calculated to have the greatest expected impact on the project to the top of the list. You are now ready to begin making specific plans for how to respond to each of these high-ranked risks.

Plan Risk Responses

You have already planned your approach for handling risk, identified the potential risks, and performed qualitative and quantitative risk analysis. You now have the top-ranked list to deal with. Next, in this straightforward method for risk management, you will plan the way in which you will respond to each of these top ranked risks. PMBOK® recommends four general strategies for both negative and positive risks (see Figure 2 below).

	For negative risks:	For positive risks:	
	• Avoid	• Exploit	
	• Transfer	• Share	
	• Mitigate	• Enhance	
	• Accept	• Accept	

Figure 2

The strategy you choose will depend, in part, upon the earlier analysis of your organization’s attitude toward risk. Other considerations include the EMV of the risk, the timing of the potential risk, and recommendations from subject matter and risk experts. The strategy you select will help determine the specific response plan for each of the top-ranked risks. For the highest-ranked risks, document both a contingency plan (Plan A) and a fallback plan (Plan B). Be sure to consider budget and schedule the activities that will be required to implement the documented responses.

For each top-ranked risk, identify how you will know if/when the risk is about to occur. This symptom or warning sign is known as the risk “trigger.” At the same time, assign a team member the responsibility of watching for the risk trigger, in order to know when to implement the documented response for each risk. By doing this, you have now closed the loop; you have the risk, the response plan, the indicator, and the person responsible for taking action, if/when the risk occurs.

By now, you're feeling less afraid and more confident in your ability to manage risks. But, your job isn't quite over, because all projects are subject to many changes – changes in scope, cost, and time, in addition to changes in resources, management, project teams, etc. So, you must monitor and control risks while you are monitoring and controlling all other aspects of the project.

Monitor and Control Risks

Just as there was a direct correlation between other planning processes and the risk planning processes, there is a direct correlation between the monitoring and controlling processes (see Figure 3). As changes occur to the project, changes also occur to the potential for risks. Some changes are approved and, therefore, changes to the cost and schedule can be planned for. Other changes just occur without prior planning. But, all changes offer a potential for additional risks.

Monitoring & Controlling	
Monitor and control project work	Monitor and control risks
Perform integrated change control	
Control schedule	
Control costs	
Perform quality control	
Report performance	
Administer procurements	
Bolded Items - potential sources of risk or changes in risk	

Figure 3

When you monitor and control risks, you actually do much more than just that. You track the risks, evaluate the effect of the implemented risk responses, continue to identify new risks, and change the qualitative and quantitative rankings as needed. You also evaluate the impact of secondary and residual risks – risks that may remain after, or be caused by, implementation of a risk response.

To do all of these tasks requires you to know how the project is doing from an over-all standpoint, which may be obtained from the results of monitoring and controlling all the other processes shown on Figure 3. Earned value analysis will show how well the costs and schedules have been controlled. Work performance and technical performance information will provide additional information for variance analysis. Procurement audits will provide even more valuable information for monitoring and controlling risk. Additionally, you will need to invite someone from outside the project to perform risk audits in order to validate the effectiveness of your risk planning and risk responses.

Another very important component of monitoring and controlling risk is reserve analysis. You must constantly be aware of the amount of time and money that you set aside for risk, and compare that to the risks remaining

on the project, but, you aren't quite finished, yet. You still need to document the results of the monitoring and controlling, and that takes us back to the very integrated nature of all the processes.

Risk Management Is Necessary

Just as the other processes, and the documentation from those processes, provided input for the risk management processes, the risk management processes provide updates to many other project documents, balancing the interrelationships among them all. The following list shows some of the project documents that will be updated as a result of performing the risk management processes.

- Technical documents
- Assumptions Log updates
- Project management plan and all of its components
 - Schedule management plan
 - Cost management plan
 - Quality management plan
 - Procurement management plan
 - Staffing management plan
 - WBS
 - Schedule baseline
 - Cost performance baseline
- Recommended corrective and preventative actions

Because of the relationships among all the project management processes, a change in any one often sets in motion changes to one or many others. Risk management changes are no different. In order to clearly track what happens on your projects, you must understand, appreciate, and document all changes and their effects on other processes. Monitoring and controlling all processes, including risk management processes, and documenting the results of monitoring and controlling continues until the project is closed. This is a necessary responsibility of the successful project manager.

Summary

Risk cannot be managed in isolation; instead, it requires an integrated approach. As you plan, execute, monitor, and control the other project management processes, complete the risk processes concurrently. Take this easy and straightforward approach to plan for and handle all aspects of risk management in order to protect the schedule, scope and costs for all your projects.

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About the Author:

Gloria C. Brown, a full-time Professional Skills Instructor for Global Knowledge, has over forty years of professional experience. She holds B.S. and M.S. degrees in Education and an M.S. degree in Business (Decision Sciences). She has served as a public school teacher, an IT project manager, a project management consultant, a Business Communications instructor, and a Professional Skills Instructor. During the last 25 years, she has managed enterprise wide and national projects for entities such as the State of Georgia, The University System of Georgia, Atlanta Housing Authority, Coca-Cola USA, CONTEL, Digital Equipment Corporation, Atlanta Public Schools, and other public and private sector organizations. As a Senior Faculty Member, she taught Business Communications classes for over ten years for Keller Graduate School of Management. At Global Knowledge she combines her love of teaching with her passion for project management through teaching, developing courses, writing white papers, and mentoring students. Her teaching philosophy is that people learn when they have fun and can relate new concepts to real-world experiences. She stays young by walking in 10k races and taking adventure vacations around the globe. She holds PMP certification and is a member of the Atlanta Chapter of PMI.