Proven Project Risk Management Techniques for Increased Project and Organizational Success

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Abstract

Management of medium to large complex procurement and integration projects is a difficult challenge. Project decisions at startup tend to focus on decisions on how to achieve near term goals and milestones. Risk management activities are often viewed by leadership as a project expense with little or no return and as a result are generally not properly implemented.

The ability of the project manager to implement proven project risk management techniques will result in increased leadership credibility of the project manager in the eyes of the project team, peers and management along with improved probability of project and organizational success.

Project risk management doesn’t have to be expensive or time consuming - the key is to keep the scale and cost of managing risks in proportion to the scale of the project itself and the types of risks that are presented.

The goal of this presentation is to describe proven project risk management techniques and to assist attendees in how to use these techniques for increased project and organizational success.

Introduction

Project staff generally are overloaded, especially at project startup, as they are actively involved in a number of simultaneous and critical tasks. Where possible, additional staff are assigned to assist the project and, due to schedule constraints or cost overrun pressures, begin supporting the project immediately to attempt to show progress and improve schedule and cost performance. As a result, project plans are generally often not read or followed.
Further, project staff tend to delay admitting that their project contains risk, as well as delay communicating risk and how to deal with the risk. The tendency is to identify risks that are outside the project manager’s control because it’s easy. There is also a general lack of understanding, identification, and effective management of the interrelationship and linkages between various risk areas within the project and the organization.

Experience has shown that the above behavior ultimately results in projects failing to meet their goals. To avoid this, it is critical that the project manager be able to understand what the key project issues and risk areas are and always be in a position to communicate these effectively to internal and external stakeholders. It is also important for executive management to be able to quickly determine where and when these concerns are active within a project.

**The Link between Project Success and Risk Management**

All projects implicitly have uncertainty and associated risks. Organizations that adhere to strong project management methods, including in depth evaluation of scope, schedule, and cost, ongoing risk management and measurement of project results, are consistently more successful than those that do not. Risk management processes go hand in hand with strong project management. Project management without proper consideration and integration of risk management, in the opinion of the author, is not true project management.

Risk management is a continuous project process, as shown in Figure 1.

![Figure 1: Risk management as a continuous project process](image-url)
It is important that the project manager be able to understand what the key project issues and risk areas are and be able to communicate these effectively to internal and external stakeholders. It is also important for executive management to be able to quickly determine where and when these concerns are active within a project.

Following a structured project risk management method enables projects and organizations to predict and respond to risks, better manage schedule and costs, and deliver quality results that satisfy stakeholders. In the most mature project management organizations, these project goals are directly linked to strategic business objectives, giving these organizations a powerful competitive advantage. This is the basis of project portfolio management.

Unfortunately, risk management activities are often viewed by leadership as a project expense with little or no return. A major challenge to most organizations is appreciating how project risks interact across the organization and how to maximize opportunities among them.

For a project and an organization to be successful, leadership must foster an environment where there is a healthy perspective on risk and its management. The goal is to have a culture where all decision making within the organization, whatever the level of importance and significance, involves the consideration of risks in an atmosphere where there are no risks that are out-of-bounds for discussion.

Management of risk has to be embedded in the management philosophy right from the top, and it must support the realistic and open recognition of project risks even if they indicate problems with the project. Otherwise, stakeholders may develop a narrow focus on risks, exposing the project to unnecessary delays, negative financial impacts, and potential damage to the organization’s reputation.

**Implementation Critical Success Factors**

There are several factors that lead to successful project risk management implementation. These factors include:

1. Having a sound knowledge of proven project risk management principles and processes;

2. Understanding and being able to effectively communicate a project to various stakeholders;

3. Properly documenting and analyzing project assumptions for risks;

4. Knowing how to apply the proper level of risk management to a project;

5. Developing a properly structured project schedule;
6. Ensuring risk management activities are properly included in the project schedule;

7. Recognizing the benefits of schedule and cost risk analysis;

8. Tempering optimism with reality;

9. Understanding the role of the project manager in the risk management process; and

10. Integrating the above into an Event Based Risk Management approach.

The above list is based on the experience of the author and represents proven techniques which form the basis of no-nonsense project risk management which every project manager should address as part of their current and future projects.

Understand The Basics

A Guide to the Project Management Body of Knowledge (PMBOK® Guide) - Fourth edition defines project management as the application of knowledge, skills, tools, and techniques to project activities to meet project requirements (Project Management Institute, 2008). Inherent in all projects is uncertainty. Risk is generally viewed as a state of uncertainty where some possible outcomes have an undesired effect or significant loss. A more appropriate definition of a project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on project objectives.

It is important that the project manager be knowledgeable and fully versed on the PMI project risk management principles, concepts, and processes. The six risk management processes that are recognized as good practice on most projects most of the time are shown in Figure 2.
A common misconception is that risk management is supplementary to the project management set of processes. A more appropriate approach is to view risk management as core to the overall project management approach. Effective risk management is critical to project success and must be forward-looking and continuous.

An alternate method by which to view the six project risk management processes is shown in Figure 3.
A number of references, handbooks, textbooks, and courses are available for project managers to become more familiar with project risk management processes, tools, and techniques. An excellent reference is the PMI Practice Standard for Project Risk Management, (Project Management Institute, 2009), which clearly builds on the principles underlying the six project risk management processes in the PMBOK Guide-Fourth Edition.

**Develop an Executive Project Summary**

Clearly show understanding of your project by developing a single page high-level view with key activities and milestones identified. Without a clearly understood overview of the project, there is an increased likelihood of project rework and delays.

The Executive Project Summary (EPS) is a composite event diagram that captures, on a single page, key events and considerations over the life of the project. This graphic representation provides project managers, project teams, and executive management with a comprehensive overview of a project, no matter how complex, and facilitates a common understanding of project goals. Without a clearly understood overview of the project, there is an increased likelihood of project rework and delays. A sample executive project summary is shown in Figure 4.

![Figure 4: Key components of an Executive Project Summary](image-url)
Properly Document and Analyze Project Assumptions

A common item that often is overlooked or improperly addressed is how project assumptions and constraints are identified, reviewed, and documented. Experience has shown that the process of how to manage project assumptions and constraints is essential to clearly understanding project scope, minimizing project risk and increasing project as well as organizational success.

Assumptions in project management refer to specific items that are considered to be true or certain when planning a project without necessarily having proof of it in reality. Unfortunately even the most carefully considered ones typically carry with them a certain element of risk and if not properly addressed, result is a false sense of security in the project, senior management team, and the customer. This is not a good situation to be in and should be avoided.

The project manager and the complete project team must always be aware of all project assumptions and constraints. Major assumptions and constraints must be clearly communicated to senior management and relevant stakeholders.

Determine the Appropriate Level of Risk Management

All projects have risk. Experience has shown that a limited number of organizations claim to be satisfied with the application of risk management on their projects, or be able to demonstrate it successfully. Improving project risk management involves two basic objectives; improving the ability to identify and influence risk while there is opportunity in the project lifecycle to do so, and embedding the management of risk into the project environment itself.

Effective project risk management requires the generation of a Risk Management Plan (RMP). The RMP is the major artifact developed during the Plan Risk Management process identified in Figure 1. The RMP identifies the strategy to identify and handle negative project risks (threats), both technical and non-technical before they become issues and cause schedule, cost, or performance impacts. The RMP should also identify positive risks (opportunities) such as schedule enhancements, cost savings, and performance improvements.

The RMP is generally referenced or is part of the Project Management Plan (PMP). The RMP may take various forms from a simple spreadsheet for smaller projects to a separate complicated document for large projects. Numerous templates are commercially available and there are also many available on the Internet. Project managers, however, need to be careful with available templates as there is no one size fits all RMP.

The key is to keep the scale and cost of managing risks in proportion to the scale of the project itself and the types of risks that are presented to the project and the
organization. Spending too much time assessing and managing risks when it is not warranted for the project at hand can divert critical resources that could be used more effectively. In the words of the author, ensure you are “risk smart”.

Develop a Proper Schedule

A schedule is a required tool of project management. Unfortunately, the development of proper schedules is not well understood by most project managers. Project managers need to properly understand the implementation and use of proper scheduling methods as a tool to plan, coordinate and schedule the execution of projects. This is critical if schedule risk analysis is to be performed at a later stage. A clear and agreed to overview of the project, however, is required first. As previously discussed, the Executive Project Summary is an excellent tool to do this. Project managers must avoid the trap where a schedule “deep dive” is done too early because available scheduling tools make it easy to do so. Without a clearly understood overview of the project, it will be very difficult to properly implement the project in a schedule resulting in an increased likelihood of schedule rework.

Include Risk Activities in the Project Schedule

Through the proper identification of discrete work activities required to complete the project and the relationship of those activities to one another, a proper project schedule allows for the determination of what activities and deliverables are critical to completing the project successfully.

A common mistake by project managers is to not include the activities associated with the management of risk in their project schedules. Incorporate risk management activities into the project schedule and do not leave them in a separate risk register. This provides increased visibility of these activities and allows them to be more easily integrated into your project activities. By including risk mitigation tasks in the project schedule, action plan progress and effectiveness can be reviewed on a regular basis and reported at project status meetings. This allows the allocation of resources and budget for these activities.

A further worthwhile step is to map the project risks in the schedule to program activities through the project Work Breakdown Structure (WBS). This mapping provides a method by which grouping of risks may be identified highlighting areas where further investigation by the project manager may be required.

Perform Schedule and Cost Risk Analysis

Many project managers rely too heavily on the Critical Path Method (CPM) to provide the most likely completion date and not enough on their own past schedules or experiences. This results in schedules dates which most of the time are inaccurate and optimistic. Further, project managers simply add up estimates at completion for WBS
components as a way to build up a project cost estimate. This results in cost estimates which are also inaccurate and optimistic resulting in projects overrunning their cost estimates. To make things worse, these two activities tend to be done separately without using the data from one to influence the other. The end result is an inaccurate estimate of the project both from a schedule and cost perspective leading to potential schedule delays and cost overruns.

Schedule Risk Analysis (SRA) is the application of the Monte Carlo technique to the project schedule. A Guide to the Project Management Body of Knowledge (PMBOK® Guide) - Fourth edition identifies the Monte Carlo technique as the typical method of modeling/simulating projects (Project Management Institute, 2008). Similarly, Cost Risk Analysis (CRA) is the application of the Monte Carlo technique to the project costs.

One of the artifacts of the SRA process is the distribution chart plots that predict the finish date(s) of the selected event(s) for each schedule simulation. This will provide the project manager and the project team with an understanding of the likely range of finish dates; the confidence in meeting the target date; and the worst-case completion date. Figure 6 details an example of an SRA distribution chart showing the typical distribution of the projected finish dates against the probability of meeting those dates.

![Figure 6: Sample schedule risk analysis distribution.](image)

In almost all cases, projected finish dates occur later than planned and need to be reworked to be brought into the target range. SRA is an iterative process. Outputs are fed back into the development of the plan to get to an acceptable level of confidence. The goal is to have each event probability in the 80% - 90% range.
Similarly, CRA ideally requires that the project costs be built using three-point estimates. To determine the contingency to be allocated to the project, we need to define what confidence level we would like to achieve: The higher the contingency level, the larger amount of contingency needed. Figure 7 details an example of a CRA distribution chart showing the typical distribution of the projected project costs against the probability of meeting those costs. The chart shows that to have a 90% confidence factor on project completion costs, the required project budget is $94 M.

![Figure 7: Sample cost risk analysis distribution.](image)

The best approach is to implement integrated cost-schedule risk analysis which includes the impact of schedule risk on cost risk to properly identify cost contingency reserves.

**Break The Cult of Optimism**

A key role of the project manager is to motivate their team for increased project execution performance. Unfortunately, the level of motivation may result in excessive optimism and result in the project manager and the project team overestimating their degree of control of project activities and their odds of success. This is known as optimism bias and includes a tendency to over-estimate the likelihood of positive events and under-estimate the likelihood of negative events.

Project managers must temper optimism with reality and ensure that their projects are viewed by staff and stakeholders in a balanced and realistic manner. Failure to do so may result in unrealistic schedule and cost commitments significantly increasing risk within the project and the organization.
Know Your Role

The project manager has overall responsibility (and in turn accountability) for delivering a successful project. As a result, the success of project risk management on a project is directly attributable to the activities and engagement of the project manager.

The project manager has direct responsibilities in the risk management process and these include the following:

1. Ensuring the project's risk register is current;
2. Encouraging and facilitating open and honest communication about risk;
3. Determining contingency reserves to deal with risks;
4. Seeking management reserve where required;
5. Regularly reporting risks;
6. Monitoring participant bias to minimize any impacts;
7. Ensuring the collection of high quality risk data;
8. Monitoring and recommending improvements to the project risk management process; and

Project managers must remember that they are responsible to ensure that nothing significant is overlooked and that risks are realistically assessed.

Implement Event Based Risk Management

Event Based Risk management (EBRM) is a proven management technique and should be an integral element of any project. It is equally applicable during the project planning and the execution phases. EBRM offers the following discriminators:

1. Top-down approach to provide the big-picture view, as opposed to a bottom-up approach;
2. Event-centric view with a focus on key events/deliverables;
3. Inherent schedule analysis to increase the probability of project success;
4. Key artifacts that greatly facilitate understanding of the entire project and of the key risks to the project. These artifacts are extremely effective for communicating important project information to both the project team and to other stakeholders, such as senior management; and

5. Consultative inputs from others who have had similar experiences and leverage of lessons learned.

The EBRM process overview is shown in Figure 8.

![Figure 8: EBRM overview.](image)

The EBRM process is an iterative process applicable to both the proposal and execution phases of a project. It is also of benefit in addressing specific problems or challenges within a project phase. For example, EBRM may be used to assist in the planning of a technology insertion activity in a large system where many stakeholders are involved.

EBRM may also be used to address the steps required to correct a major deficiency of a software build within an overall project. If EBRM was not implemented during the proposal phase of a project, the project manager should consider implementing the EBRM process as soon as possible if for no other reason than to facilitate project monitoring and improve communications with the project team and stakeholders.
Conclusion

The ability of the project manager to implement proven project risk management techniques will result in increased project and organizational success. There are several critical success factors that lead to successful project risk management implementation and every project manager should address these as part of their current or future projects.

About the Author

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Laszlo offers more than twenty-five years of experience in the project management and engineering fields. Prior to his current roles, Laszlo held a number of senior and executive engineering, project management, and business development positions at General Dynamics Canada, a division of General Dynamics Corporation. Previously, Laszlo was with the Irving Group of Companies and SED Systems.

Laszlo has been happily married to Lisa for over twenty-five years and has two great sons, Andrew and Alexander. Laszlo earned his Bachelor of Electrical Engineering from the University of New Brunswick in 1984. He can be contacted at laszlo@retfalviandassociates.com. More at www.retfalviandassociates.com