

# PROJECT RISK MANAGEMENT

- Simplified concepts and tools to assess, rank, and manage high-risk projects and tasks
- Clear templates and models
- Proven methods of integrating risk management into business and project planning
- Techniques for monitoring risk using earned value
- Practical models for strategic and project risk planning

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# Preparing the Organization: Building a Risk Management Culture

Building a culture of risk management is primarily a process of developing people in your organization who think and plan projects effectively, and who are supported by company systems that encourage them to think and plan effectively. That involves looking constantly at what could go wrong and knowing the difference between theoretical risk and practical risk. Theoretical risk is risk that *could* happen; practical risk is risk that is *likely* to happen. Experience helps to differentiate the two.

## Prepare the Organization

If the organization does not address risk in *the way work is done*, risk management will fail. Defining culture as the way work is done in the organization, if risk is integrated in the way work is done (e.g., project plans incorporate a risk matrix as defined later in this book) risk planning becomes an expected part of planning. If risk is given lip service but not backed up, then risk management will be superficial and ineffective (Fig. 1.1).

The best way to illustrate risk is to tell a little story about what happens when risk is not in the organization's culture. See if you can relate to the following story.

"I got the customer's approval to do the Schneider program," Lakeisha told Bill. Lakeisha and Bill were project managers at Project Associates, Inc., a software and information technology company. "I've got 4 months to deliver the program to Schneider, including a new hardware platform, software code and documents, and a training manual. I think it's going to be a blast—the biggest issue to me is the software. The hardware is a no-brainer."

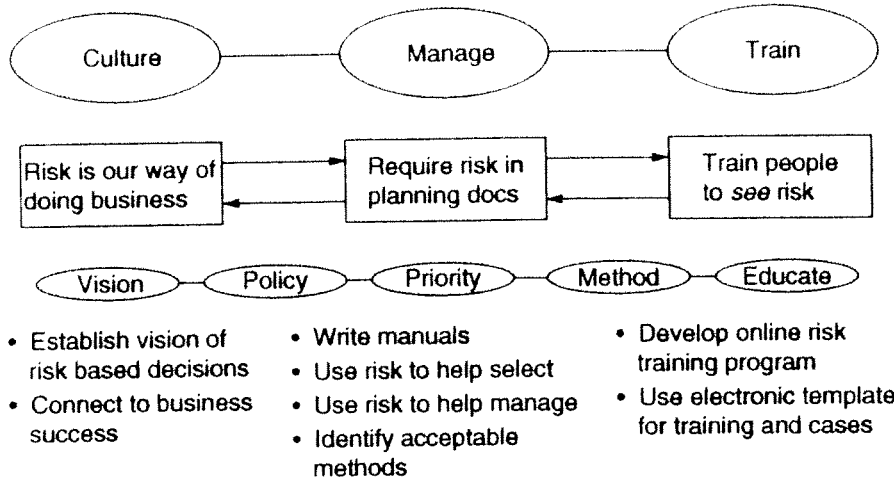


Figure 1.1 The process of preparing the organization.

Lakeisha had delivered her last project, the Mires program, well ahead of schedule. Bill, on the other hand, had not done well in his last project and was late and over budget. Lakeisha was eager to show that her last performance was not a fluke and that she knew what she was doing. She always harbored little lack of confidence under pressure, but always came through. There was a subtle competition going on between the two, but they worked well together.

“I wouldn’t get too excited just yet,” Bill told her. “You know I was going to do that program, but I got sidetracked and the boss gave it to you. I’ve seen the specification for the program, and there are a lot of risks. I think you’ve got at least 6 to 7 months of work with the current team to produce the deliverable as I see it. And that is if you don’t have any problems with platforms, software, people, our old testing equipment, and good old unreliable software systems, our contractor. Are you going to go with the same team you used last time? Planning any risk assessment and contingency—you know, those scenario things?”

“Yes and no. I am going to use the same team, I think, but I don’t have time for the risk stuff this time. It isn’t a required part of the project plan, especially if you have been there before as I have. Been there, done that. I will use a schedule from our last project for Smothers, which was a good run and we kicked butt. I have looked at the risks and the big ones are in the software graphics package and online training package. I’ve got a plan to shrink the schedule to 4 months by crashing some stuff and outsourcing. I read an article on outsourcing last week and the story included a great company that does just what I want them to do—or almost. That is going to cut my schedule by 2 months. This project has to be on the fast track from the word go. I am going to write a cost plus

contract with them because procurement says that is the template they like to work with.”

“Well, I hope you know what you’re doing,” Bill said to Lakeisha as they crossed in the corridor. “I have seen a lot of people get burned by contractors and you know that the hardware for this deliverable is new and will require some long lead times on parts.”

“Cool it Bill. I’ve picked a reputable contractor,” Lakeisha said. “I checked his references—actually I just talked to a friend who works there—and I am sure that the contractor will do a great job and will accept most of the risk. I told him I would make progress payments on the cost plus contract only if he was on schedule and he agreed. He said he would put more people on the job if it turned out to be more complicated than he thought it was. I will just keep an eye on him. I understand that his is a risky business and some risks are inescapable. But what an opportunity to show what we can do—think of the plus side of this thing if it goes! When I have this much to do in such a short time I’m not going to waste the team’s time on risk games and risk matrices. I know what I want and I know what the risks are.”

Bill thought she should be more careful, but liked her spirit. He and Lakeisha had been over this ground before. He had learned some lessons on risk in his previous project, which failed because he was hit by an unanticipated shortage of key technical people and a surprise glitch in getting parts for the hardware platform. He had been reading about a new theory of “constraints,” which focused on resource and equipment availability risks and not just critical path issues. But he had learned not to argue with Lakeisha when she had already decided what she was going to do.

Lakeisha met with the contractor and gave him the specification before her procurement office could get the scope out and signed, but they didn’t have a problem with that and she didn’t have time to go through formal signatures anyway. It turned out that the contractor, Mag Company, was headquartered in New Delhi, India, but had a local office. Their procurement people had said the specification made sense and that they would get on it right away—they too felt that it could go ahead without a signed contract. They needed the work.

Six weeks later, Lakeisha called the local Mag Company project manager, Abdur Manat, to check on progress. “Everything is going great,” he said. “But we have been working on a high-priority project for another company who came in just last week with a heavy job due yesterday, of course. So I have not made as much progress as I had hoped.” Lakeisha responded, “Maybe I ought to have a schedule from you, particularly on the tough pieces of the work you see as potential problems.” Abdur replied, “But I

still have 3 1/2 months to do 2 months of work, so I don't see any problems. Did you send me those specs on the hardware? By the way, did you say that the customer wants online training—what's that?"

Lakeisha hesitated but disguised her concern in a positive expression. "That sounds fine," she responded. "Let me know if you need anything. I'll be back in touch in another 6 weeks, and then we can talk about integration."

For the next several weeks, Lakeisha spent most of her time trying to put together the specifications for an online training program for the contractor, a task she hadn't anticipated. She also inquired on the lead times for the new hardware, but the design people were busy on other work.

Six weeks later, Lakeisha called Abdur to check on progress. "The last project took me longer than I expected," Abdur said. "I've gotten into the graphics work and looked at your hardware requirements, and I've been working like crazy, but now that I have taken a closer look at it, I think there's at least a good 3 months of work on this job, particularly on that online training stuff you sent me—I will have to sub that out."

Lakeisha almost choked on that one. Her stomach told her she was in trouble and she murmured to herself. That would make the total development time for the Schneider project 6 months instead of 4 months. "Three months!" she said, "you have to be kidding. I need the software code in 2 weeks to begin integration. You were supposed to be done by now! I am not paying your last invoice."

Abdur responded, "OK, but you already paid our last invoice—your accounting office has been very efficient. We just got the check, along with a nice holiday greeting." Lakeisha knew this was not her day.

"I am truly sorry," Abdur said, "but this isn't my fault. There's more work here than we could have ever done and more than you estimated in your schedule. We found that the software code doesn't work in your hardware and we haven't been able to figure out why. And your team people aren't available to talk to. I will finish it as fast as I can."

It turns out that Abdur delivered the software in 3 months, but the project took another month after that because of integration problems with the in-house team's code. In the end, the Schneider program took over 7 months rather than the 4-month estimate. Lakeisha concluded that Bill and the company had "sandbagged her" by palming off a bad project that he was not able to handle and that had inherent big risks.

What is missing in this organization is a risk-based business culture. Lakeisha was treating the project in a careless and superficial way. She acts as if she is *the only* agent of project success. Her company has isolated her in a narrow project manager role without support systems, incentive, and training. A company

that lets a project manager perform that way is a company that does not understand its own culture.

### **Risk: The Organizational Culture Issue**

While risk is traditionally seen as an analytic activity (identifying and assessing risks in the project task structure, and applying decision trees, sensitivity analysis, and fine-tuned probabilities) the essence of risk management is the way your organization treats risk and the way you and your team think about the project. The challenge for the organization is teaching and training project leaders and team members to think in terms of risk and to internalize the risk management process into their daily work. They are the front line of risk management. The assumption behind this approach is that risk management is “something I want my people to do in the normal course of their work,” not something I want a specialist to do later in the project as a separate audit exercise. Risk is a way of visualizing the project and its successful outcomes and *seeing* potential pitfalls. You can’t see risks if you are not looking for them.

So the successful management of risk is usually the product of a successful organization that has instilled into its people the importance of careful planning. Careful planning involves a core competence—the capacity to dimension uncertainty and risk, to integrate risk identification and assessment into program and project planning, and to build and sustain a support system for risk management that provides essential information when it is needed. But how does an organization build risk into its daily work, and how do executives use their leadership and institutional leverage to further good risk management?

### **A Culture of Risk Management Competence**

The successful risk management organization has five basic competencies:

- Active training and development in risk planning and management
- Strong linkage between corporate planning and project planning, particularly between business analysis of threats and opportunities, and analysis of project risk
- Deep project experience in its industry
- Capacity to document project experience and “learn” as an organization
- A workforce of strong functional managers who address product quality as a risk reduction issue

### **Link Corporate and Project Planning**

Strong ties between corporate strategic planning, including market analysis, and project planning ensure that the business “sees” its technological risks early in its business planning and is able to anticipate and dimension the risks it will

face in designing and implementing projects that carry out its strategies. For instance, a telecommunications firm that performs SWOT (strengths, weaknesses, opportunities, threats) analysis in its field may uncover a potential threat in unanticipated breakthroughs in telecommunications cable technology. Addressing contingencies at the corporate level to address these potential breakthroughs (opportunities created from analysis of threats) helps the business support its selected projects that involve such new cable systems.

### **Training and Development in Risk**

Training and development programs that address risk identification, assessment, and response can help build professional competence in handling risk issues in real projects. Such training would include a curriculum in:

- Building a WBS (work breakdown structure)
- Identifying risks in the WBS
- Producing a risk matrix

### **Project Experience**

A company that “sticks-to-the-knitting,” as Tom Peters called it in *Search for Excellence*, is in a better position to recognize and offset risk simply because its workforce is likely to have a better handle on the technology and process risks inherent in its core business. Whenever a business departs fundamentally from its core competency areas, it stands to experience unanticipated problems, which develop into high-impact and high-severity risks.

### **Learning Organization**

A learning organization, as Peter Senge describes it, is an organization that does not reinvent the wheel each time it plans and implements a project. This means that lessons learned from real project experiences are incorporated in documentation and embedded in training programs so that project managers learn from past experiences. Communication is open in such organizations, leading to a process by which project experiences are “handed” down to next generation project teams.

### **Strong Functional Managers Address Quality**

The existence of strong functional management ensures that the basic functional competency of the company in areas such as engineering or system development is backed up by technology leaders in the field. Key processes like product development are documented and product components controlled through with disciplined configuration systems. This means that the risks of

product quality failures that result from product component variation are minimized in methodologies such as six sigma simply because the company can replicate products and prototypes repeatedly for manufacturing and production without variation.

## Building the Culture

*Organization culture* can be defined as the “prevailing standard for what is acceptable in work systems, work performance, and work setting.” A *risk management culture* can be defined as the “prevailing standard for how risk is handled.” An organization with a strong risk management culture has policies and procedures that *require* its workforce to go through disciplined risk planning, identification, assessment, and risk response project phasing.

A mature organization does not treat risk management as a separate process, but rather “embeds” the risk process into the whole project planning and control process. Risk is an integral part of the thinking of its key people. In the same way that the quality movement matures to the point that quality assurance and statistical process control processes become institutionalized into the company rubric, risk assessment tools and response mechanisms become an indistinguishable part of a company mosaic in a mature organization.

Sustaining the culture of risk management is considered a major function of corporate leadership in the *risk-planning* phase. Although most organizations do not enter the risk-planning phase as a distinct step in the project planning process, best practice addresses potentially high-risk tasks, assigns probability implicitly to the process, and develops optional contingencies that may or may not be documented in a formal risk matrix. This is typically not a mysterious, mathematical process, but rather an open, communicative process in which key project stakeholders, team members, and the customer talk about uncertainty and identify key “go or no go” decision points. They often know where the key risks are in the project process because the project itself is grounded in addressing a risk that the customer is facing.

## Keane’s Risk Process

A good example of a strong risk management culture is found at the Keane Company.

Keane connects and integrates risk with cost and schedule estimating, e.g., identifying project risks and determining actions to minimize the impact on the project and to improve project estimates. In other words, Keane thinks in terms of risk as a guide for cost estimating, scheduling, and defining mitigation actions.

The process starts with an estimating process that takes much of the guesswork out of estimating. Keane has established a set of guidelines, techniques, and practices to pin down estimates and to ensure that customers and stakeholders clearly understand associated risks. Keane emphasizes communication on the relationship between a given project estimate (project schedule and cost



estimate) and how the estimate has handled risks and risk mitigation. Their experience is that project success does not depend as much on completely mitigating risk as on communicating risk up front so that stakeholders can make judgments and decisions along with the project team as things happen.

In building the culture for risk management, Keane warns its people about the hazards of estimating:

- Making sure they know the difference between negotiating and estimating. Estimating is the calculation of schedule and cost given the tasks at hand; negotiation is working out differences between the estimate and a customer or client schedule and cost.
- Understanding the variations in technical skill in how those variations can impact estimates.
- Being objective about your own work.
- Adjusting to the lack of an estimating database.
- Being too precise before it is needed, understanding the timing for order-of-magnitude, ballpark estimates, versus the need for more detailed budget and definitive estimates.
- Understanding the limitations of work measurement.
- Looking at untracked overtime in building estimates from past work.

Keane advises its people to ask the question “who is at risk?” before you ask the question, “what is at risk?” This is because the issue of risk is framed by those who are affected by it, not by some arbitrary quantitative formula. Different project stakeholders have different perspectives on risk and estimates, and indeed their perspectives change during the life of the project. It is best that risk assessment be guided by those who will suffer the consequences of risk and who will bear some or all of the cost of risk mitigation.

The role of the project planner/manager during this process is to inform the process with parametric data. Keane has found that in many cases the person asking for the estimate is more at risk than other stakeholders, or the project manager, really understand. This is because the person asking is going to use the estimate to make business critical decisions. For instance, if a client for a new information system is facing the possibility that a new system cannot handle the estimated user load on it projected for peak periods, then that client must make a decision either to limit the user universe or upgrade the system. So the estimate of risk is key to the client decision process and will affect client success.

Keane integrates cost and risk to better understand how risk effects project schedules. By training its people to identify risks from broader business and industry data and to schedule risk planning and management activity into the project baseline schedule, the company delivers an important message to its people.

## Addressing Risk with Scenarios

Keane is a good example of a *projectized* company that uses risk scenarios to get its project teams to anticipate risks in the planning process. It encourages the development of issue or scenario statements that pose potential problems—variations from the plan—in a project and generate queries about the issue. For instance, Keane might encourage a project manager developing a new project information system to build the following question into an early project review session: What challenges does this new system create for the customer and what is the likelihood of these challenges becoming project “show stoppers,” what case we do about it now?

## Performance Incentives

Any organization building a risk-based culture must provide incentives for integrating risk into the project planning and control process. The incentive for handling risk is top management support and resources. Top management support comes when project management identifies and anticipates business risks that save the company time and money. Project managers who manage risks effectively are likely to be more successful in acquiring additional resources because they tend to have backup and contingency plans ready when risks occur.

## Taking Risks: The Risk of “Blinders”

One of the major risks in any project is the tendency of its key project decision makers, especially the project manager, to overestimate what they know and underestimate what they don't know. The risk is that key people will “take risks” but not manage risk. This means that the beginning of good risk management is the capacity to know what the organization and its people can do and what they cannot do.

The field of organizational behavior contributes a tool called the *Johari Window* that is helpful in analyzing personal tendencies of project managers to take risks rather than manage them (Fig. 1.2).

The Johari Window, named after the first names of its inventors, Joseph Luft and Harry Ingham, is one of the most useful models describing the process of human interaction and behavior. A four-paned “window,” as illustrated below, divides personal awareness into four different types, as represented by its four quadrants—open, hidden, blind, and unknown. The lines dividing the four panes are like window shades, which can move as an interaction progresses.

A typical project manager might go through the following thinking process personally to test what he or she knows:

1. The “open” quadrant represents both things that I know about myself and that others know about me. For example, I know my name and so do you, and

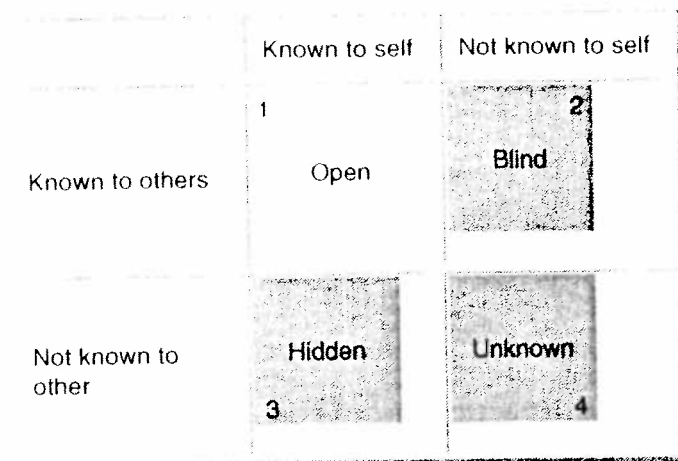


Figure 1.2 The Johari Window.

you know some of my interests. The knowledge that the window represents can include not only factual information, but my feelings, motives, behaviors, wants, needs, and desires. Indeed, any information describing who I am.

The risk here is that what is open to some coworkers may not be open to the customer or a project sponsor. So it is important that a project manager get to know the customer and key sponsors or stakeholders as people. The focus is customer expectations; if there is an open process on expectations then the chances of managing risk are high.

- The “blind” quadrant represents things that you know about me but I am unaware of. So, for example, we could be eating at a restaurant, and I may have unknowingly gotten some food on my face. This information is in my blind quadrant because you can see it, but I cannot. If you now tell me that I have something on my face, then the window shade moves to the right, enlarging the open quadrant’s area.

The risk factor here is that there may be variables that a competitor or customer knows about the organization that the project manager may not know. For instance, a current supplier to the project may have failed in delivery of a similar component to a competitor, but the project manager is unaware of the situation.

- The “hidden” quadrant represents things that I know about myself and you do not know. So for example, I have neither told you nor mentioned anywhere on my website, what one of my favorite ice cream flavors is. This information is in my “hidden” quadrant.

The risk here is that a project team member may not be entirely open in divulging important information about their expertise and experience.

- The “unknown” quadrant represents things that neither I know about myself, nor you know about me. For example, I may disclose a dream that I had, and

as we both attempt to understand its significance, a new awareness may emerge, known to neither of us before the conversation took place.

The risk here is that there are factors at work that are unanticipated both by the project manager and the customer.

### **Personal, Project, and Organizational Risk**

There is something very personal about the issue of risk. In many companies, taking risks is rewarded in principle, but failure in taking risks has its implications despite the company rhetoric. What the company is really saying is, "Go ahead and take risks, but take them only if you think you can succeed and produce value for the customer and the company. We will support you with data and information. Don't take risks frivolously."

For the business and project professional, risk is first a personal issue because project risk is directly associated with personal risk. If a project manager fails to see and control risk, that project manager faces the prospect of being associated with a failed project. So the way a project team faces risk has implications for each team member personally—and for the team dynamics involved in a given project.

The way the company protects its employees and officers from risk is key as well. If the company is positioned to absorb the cost of failure then the program or project manager is more likely to take the risk. Thus the propensity to accept risk and manage it successfully is partly a function of organizational support—if my company supports me, I will address risk and make the best decisions I can, but I will want to let my top management know the risks as I see them so that if the risk is not successfully controlled, it will have been a company-wide decision, not a personal one.

In sum, the model is this—the organization must position itself for risk and must empower and enable its business and project people to address and take risks, but there must be an open, organization-wide process for addressing and absorbing risk. If these conditions don't exist, the project manager is not "incentivized" to address risk and will avoid risk, often at the expense of opportunity.