Chapter 1 : Types of Risk in Project Management

Managing Project Risk. Managing project risk is an inevitable part of a project. Risks exist for various reasons, such as inaccurate scope definition and management, unforeseen circumstances, and ineffective stakeholder management.

The most common project risks are: Cost risk, typically escalation of project costs due to poor cost estimating accuracy and scope creep. Schedule risk, the risk that activities will take longer than expected. Slippages in schedule typically increase costs and, also, delay the receipt of project benefits, with a possible loss of competitive advantage. Performance risk, the risk that the project will fail to produce results consistent with project specifications. There are many other types of risks of concern to projects. These risks can result in cost, schedule, or performance problems and create other types of adverse consequences for the organization. Governance risk relates to board and management performance with regard to ethics, community stewardship, and company reputation. Operational risk includes risks from poor implementation and process problems such as procurement, production, and distribution. Market risks include competition, foreign exchange, commodity markets, and interest rate risk, as well as liquidity and credit risks. Legal risks arise from legal and regulatory obligations, including contract risks and litigation brought against the organization. Risks associated with external hazards, including storms, floods, and earthquakes; vandalism, sabotage, and terrorism; labor strikes; and civil unrest. As indicated by these examples, project risks include both internal risks associated with successfully completing each stage of the project, plus risks that are beyond the control of the project team. These latter types include external risks that arise from outside the organization but affect the ultimate value to be derived from the project. In all cases, the seriousness of the risk depends on the nature and magnitude of the possible end consequences and their probabilities. In addition to project risk, project deferral risk can be important. Project deferral risk refers to the risks associated with failing to do a project. Like project risk, project deferral risk can arise from any of the bulleted risk sources listed above the second list. Project deferral risk can also occur if there is only a limited window of opportunity for conducting a projectâ€"if the project is not conducted now, there may be a risk that it might never be possible to effectively do it later. Oftentimes, external risks contribute more to portfolio risk because they impact multiple projects simultaneously. Likewise, a construction company might have many projects threatened by the external risk of an increase in steel or commodity prices.

Chapter 2 : Risk Analysis and Risk Management - Decision Making from blog.quintoapp.com

To manage projects effectively you need to be able to recognize and manage risk. Risk is the possibility that you may not achieve your product, schedule, or resource targets because something unexpected occurs or something planned doesn't occur. All projects have some degree of risk because.

Manage risks Project Project Standard More Less All projects have risks. The key to managing a project is not to avoid risks, but to understand them. A risk is the possibility of an event or condition that would have a negative impact on a project. Risk management is the process of identifying, mitigating, and controlling the known risks in order to increase the probability of meeting your project objectives. This article is one of many project management goals on the Project Road Map. In this article Step 2: The accidental project manager: You finished designing the project schedule for a marketing campaign, and after your team reviews it, someone point outs all the red bars on the Gantt chart. You point out cleverly that this is the critical path and that there are three of them in the project. You explain that the critical path contains those tasks which, if they changed in duration, would slip the end date of the schedule. With these warnings in mind, you go back to your schedule and look more closely at the tasks along the critical path. You see a number of them that are long because only one person is working on them at the same time, and you suddenly realize that not only is this person a new hire with little experience, he is also assigned to these tasks at the very end of the schedule when the training budget will be depleted. There is too much risk on these tasks, you decide. You start using the new Team Planner feature in Project to reassign two experienced user on the later tasks that are critical, and you decrease the duration of the tasks because you know how much faster these experienced works can get a job done. The most important thing to remember about risks is that all projects contain them. The mistake beginning project managers make in small projects is not identifying risky events in their short scheduled. Here is a list of typical activities and events that can lead to risk in a project. Activity Problem Critical tasks Pay close attention to tasks that are on the critical path. They have the greatest impact on the end date of the project Multiple critical paths If you have multiple critical paths, pay even more attention. Multiple critical paths increase the number of unknowns in your project. Vendor tasks Tasks that have been contracted by a vendor have more risk than tasks that are perform by internal resources. When contracting work with a vendor, you may need to request more frequent or detailed of progress than you would with your own team members. Vendor tasks that occur at the end of a project have more risk than vendor tasks at other times in the project. Remember, that a vendor includes both contracted people outside your company as well as employees from other areas of your company. Both constitute external dependencies, and both should be treated the same in terms of status reporting and schedule timing. Inexperienced team members Be sure to plan for any ramp-up time with people who are new to the work. Inexperienced workers assigned to work at the end of the project endanger the end date of the project because of ramp-up time more than at other times in the project lifecycle. Projects that take longer than a year have more unknowns and thus contain more risk resulting from resource availability especially for experienced workers , technology changes, market forces stemming from capital forecasting indicators, and so on. Too many tasks occurring at the same time Check for an excessive number of tasks scheduled concurrently. This is especially true if concurrent tasks happen toward the end of the project. Designing a schedule backwards Beginning project managers make the mistake of creating task dependencies through linking before outlining tasks. In a nutshell, here are the steps you should take in designing a new project: List tasks, group related tasks under their summary tasks, determine durations of lowest level tasks, link the tasks. Ignoring the past A company becomes mature by recording its successes and problems from past projects. Documenting how risks were handled in a project is often part of the closing phase of a project. In this way, a company begins to grow its successes while decreases its failures. Here are three steps to start using risk management in a meaningful way to help your project succeed. Explain to your team how risks are defined in project management. People respond to a mathematical depictions or graphical depictions of difficult concepts. Explain that risk is define by this equation: This is how industry defines risk. More dramatically, if the probability of hurting yourself by lighting a match is the same in two rooms in a

building, there is only relevant risk if one of the rooms contains boxes of fireworks. Review your schedule for risk. Pay particular attention to tasks on the critical path and tasks with over allocated resources. Read the next section to learn how the experts deal with costs Hint: Putting this mathematical definition on a team board while discussing risk helps the team prioritize risks and not get side tracked by long discussions about impactful risks that are highly unlikely to happen. The seasoned project manager: You re-negotiate the contract with a vendor to change the scheduling of these late tasks, and now you feel more confident in the outcome of your project. Here are a few things to keep in mind as you explore risks. A little known concept in risk management is opportunity. Not all risks are bad. Taking experienced engineers off a project creates additional risk in your project, but in this case it may be warranted by the opportunity gained. Remember, however, to check with your PMO office, functional managers, or other stakeholders before reassigning people in the middle of a project just because you think it is good for the company. Review cost variances using earned value. Earned value is an industry standard for analyzing work and cost variances throughout the length of your project. A quick tool you can use are Sparklines in Excel The following example displays Sparklines for earned value information copied from Project to Excel. You can also use Visual Reports in Project to create a more sophisticated PivotChart of earned value commonly known as an S-curve by experienced project managers. Keep in mind three methods risk management professionals use to handle the risks in a project. Avoid the risk If the risk results in serious consequences for your project, avoidance is a good policy. For example, a company may decide that using the same manufacturing processes concurrently for two new deliverables creates a risk in project timing, and can be avoided by using the manufacturing process sequentially for the deliverables. Mitigate the risk Reducing the probability of serious risk is a useful strategy if you are comfortable with your options. For example, you can decide to deploy a simplified and well-understood manufacturing process if a more innovative and costly one will take too long to install. Transfer the risk A common way to control risk is to transfer it to an external vendor. For example, if the documentation of a computer sub-system is too large in scope for internal resources to complete, portions of it can be contracted to an external vendor to develop. Insurance companies are also used as a means to transfer risk, especially monetary risks that are transferred via warranties and payment bonds.

Chapter 3 : How to identify and manage risk in projects | AXELOS

A risk register or template is a good start, but you're going to want a robust project management software to facilitate the process of risk management. blog.quintoapp.com is a cloud-based tool that fosters the collaborative environment you need to get risks resolved, as well as provides real-time information, so you're always acting on.

Environmental People The people category can be subdivided into risks associated with the people. Examples of people risks include the risk of not finding the skills needed to execute the project or the sudden unavailability of key people on the project. A risk breakdown structure organizes the risks that have been identified into categories using a table with increasing levels of detail to the right. A partial list for the planning portion of the RBS is shown in Figure Risk Evaluation After the potential risks have been identified, the project team then evaluates the risk based on the probability that the risk event will occur and the potential loss associated with the event. Not all risks are equal. Some risk events are more likely to happen than others, and the cost of a risk event can vary greatly. Evaluating the risk for probability of occurrence and the severity or the potential loss to the project is the next step in the risk management process. Having criteria to determine high impact risks can help narrow the focus on a few critical risks that require mitigation. Only a few potential risk events met these criteria. These are the critical few potential risk events that the project management team should focus on when developing a project risk mitigation or management plan. Risk evaluation is about developing an understanding of which potential risks have the greatest possibility of occurring and can have the greatest negative impact on the project. These become the critical few. A project with new and emerging technology will have a high-complexity rating and a correspondingly high risk. The project management team will assign the appropriate resources to the technology managers to assure the accomplishment of project goals. The more complex the technology, the more resources the technology manager typically needs to meet project goals, and each of those resources could face unexpected problems. Risk evaluation often occurs in a workshop setting. Building on the identification of the risks, each risk event is analyzed to determine the likelihood of occurring and the potential cost if it did occur. The likelihood and impact are both rated as high, medium, or low. A risk mitigation plan addresses the items that have high ratings on both factorsâ€"likelihood and impact. Risk Analysis of Equipment Delivery A project team analyzed the risk of some important equipment not arriving to the project on time. The team identified three pieces of equipment that were critical to the project and would significantly increase the costs of the project if they were late in arriving. One of the vendors, who was selected to deliver an important piece of equipment, had a history of being late on other projects. The vendor was good and often took on more work than it could deliver on time. This risk event the identified equipment arriving late was rated as high likelihood with a high impact. The other two pieces of equipment were potentially a high impact on the project but with a low probability of occurring. Not all project managers conduct a formal risk assessment on the project. One reason, as found by David Parker and Alison Mobey 2 in their phenomenological study of project managers, was a low understanding of the tools and benefits of a structured analysis of project risks. The lack of formal risk management tools was also seen as a barrier to implementing a risk management program. Some project managers are more proactive and will develop elaborate risk management programs for their projects. Other managers are reactive and are more confident in their ability to handle unexpected events when they occur. Yet others are risk averse, and prefer to be optimistic and not consider risks or avoid taking risks whenever possible. On projects with a low complexity profile, the project manager may informally track items that may be considered risk items. On more complex projects, the project management team may develop a list of items perceived to be higher risk and track them during project reviews. On projects with greater complexity, the process for evaluating risk is more formal with a risk assessment meeting or series of meetings during the life of the project to assess risks at different phases of the project. On highly complex projects, an outside expert may be included in the risk assessment process, and the risk assessment plan may take a more prominent place in the project execution plan. On complex projects, statistical models are sometimes used to evaluate risk because there are too many different possible combinations of risks to calculate them one at a time. One example of the statistical model

used on projects is the Monte Carlo simulation, which simulates a possible range of outcomes by trying many different combinations of risks based on their likelihood. The output from a Monte Carlo simulation provides the project team with the probability of an event occurring within a range and for combinations of events. Risk Mitigation After the risk has been identified and evaluated, the project team develops a risk mitigation plan, which is a plan to reduce the impact of an unexpected event. The project team mitigates risks in the following ways: Risk avoidance Risk reduction Risk transfer Each of these mitigation techniques can be an effective tool in reducing individual risks and the risk profile of the project. The risk mitigation plan captures the risk mitigation approach for each identified risk event and the actions the project management team will take to reduce or eliminate the risk. Risk avoidance usually involves developing an alternative strategy that has a higher probability of success but usually at a higher cost associated with accomplishing a project task. A common risk avoidance technique is to use proven and existing technologies rather than adopt new techniques, even though the new techniques may show promise of better performance or lower costs. A project team may choose a vendor with a proven track record over a new vendor that is providing significant price incentives to avoid the risk of working with a new vendor. The project team that requires drug testing for team members is practicing risk avoidance by avoiding damage done by someone under the influence of drugs. Risk sharing involves partnering with others to share responsibility for the risk activities. Many organizations that work on international projects will reduce political, legal, labor, and others risk types associated with international projects by developing a joint venture with a company located in that country. Partnering with another company to share the risk associated with a portion of the project is advantageous when the other company has expertise and experience the project team does not have. If the risk event does occur, then the partnering company absorbs some or all of the negative impact of the event. The company will also derive some of the profit or benefit gained by a successful project. Risk reduction is an investment of funds to reduce the risk on a project. On international projects, companies will often purchase the guarantee of a currency rate to reduce the risk associated with fluctuations in the currency exchange rate. A project manager may hire an expert to review the technical plans or the cost estimate on a project to increase the confidence in that plan and reduce the project risk. Assigning highly skilled project personnel to manage the high-risk activities is another risk reduction method. Experts managing a high-risk activity can often predict problems and find solutions that prevent the activities from having a negative impact on the project. Some companies reduce risk by forbidding key executives or technology experts to ride on the same airplane. Risk transfer is a risk reduction method that shifts the risk from the project to another party. The purchase of insurance on certain items is a risk transfer method. The risk is transferred from the project to the insurance company. A construction project in the Caribbean may purchase hurricane insurance that would cover the cost of a hurricane damaging the construction site. The purchase of insurance is usually in areas outside the control of the project team. Weather, political unrest, and labor strikes are examples of events that can significantly impact the project and that are outside the control of the project team. Contingency Plan The project risk plan balances the investment of the mitigation against the benefit for the project. The project team often develops an alternative method for accomplishing a project goal when a risk event has been identified that may frustrate the accomplishment of that goal. These plans are called contingency plans. If a critical piece of equipment is late, the impact on the schedule can be mitigated by making changes to the schedule to accommodate a late equipment delivery. Contingency funds are funds set aside by the project team to address unforeseen events that cause the project costs to increase. Projects with a high-risk profile will typically have a large contingency budget. Although the amount of contingency allocated in the project budget is a function of the risks identified in the risk analysis process, contingency is typically managed as one line item in the project budget. Some project managers allocate the contingency budget to the items in the budget that have high risk rather than developing one line item in the budget for contingencies. This approach allows the project team to track the use of contingency against the risk plan. This approach also allocates the responsibility to manage the risk budget to the managers responsible for those line items. The availability of contingency funds in the line item budget may also increase the use of contingency funds to solve problems rather than finding alternative, less costly solutions. Most project managers, especially on more complex projects, will manage contingency funds

at the project level, with approval of the project manager required before contingency funds can be used. Risk management can be very formal, with defined work processes, or informal, with no defined processes or methods. Formal risk evaluation includes the use of checklists, brainstorming, and expert input. Risk evaluation prioritizes the identified risks by the likelihood and the potential impact if the event happens. Risk mitigation is the development and deployment of a plan to avoid, transfer, share, and reduce project risk. Contingency planning is the development of alternative plans to respond to the occurrence of a risk event.

Chapter 4 : Identifying and Managing Project Risk - Wikipedia

Risk management is the art of assessing and managing risk, while working on projects in the workplace. The Risky Business of Project Management It is important at the beginning of any project to go through the risk identification process.

The things that might go wrong are called project risks, and a wise project manager identifies them early at the beginning of the project so that he or she can do something about them. Of course, risk management is an ongoing activity, so you should carry on identifying and recording new risks as they come up. You also need an action plan per risk in order to be able to manage them effectively. There are 5 main ways to manage risk: Accept The Risk Accepting the risk means that while you have identified it and logged it in your risk management software, you take no action. You simply accept that it might happen and decide to deal with it if it does. Avoid The Risk You can also change your plans completely to avoid the risk. Instead, it would be better to avoid January for training completely. Change the project plan and schedule the training for February when the bulk of the accounting work is over. Essentially, you transfer the impact and management of the risk to someone else. For example, if you have a third party contracted to write your software code, you could transfer the risk that there will be errors in the code over to them. They will then be responsible for managing this risk, perhaps through additional training. Normally transference arrangements are written up into project contracts. Insurance is another good example. If you are transporting equipment as part of your project and the van is in an accident, the insurance company will be liable for providing new equipment to replace any that was damaged. Mitigate The Risk Mitigating against a risk is probably the most commonlymitigation of risk used risk management technique. What mitigation means is that you limit the impact of a risk, so that if it does occur, the problem it creates is smaller and easier to fix. As a result, they will make fewer sales and there will be less revenue for the company. A mitigation strategy for this situation would be to provide good training to the Sales team. You can mitigate against the impact, like in this example, and you can also mitigate against the likelihood of it happening. Exploit The Risk Acceptance, avoidance, transference and mitigation are great to use when the risk has a negative impact on the project. But what if the risk has a positive impact? In those cases, we want to maximize the chance that the risk happens, not stop it from happening or transfer the benefit to someone else! Exploitation is the risk management strategy to use in these situations. Look for ways to make the risk happen or for ways to increase the impact if it does. We could train a few junior Sales admin people to also give washing machine demonstrations and do lots of extra marketing, so that the chance that there is lots of interest in the new machine is increased, and there are people to do the demos if needed. These are the 5 risk management strategies that you can use to manage risk on your project. However you decide to approach risk, make sure that you log the action plan in your risk log and keep it up to date with the latest progress towards managing your risks.

Chapter 5 : Risk Management Process â€" Project Management for Instructional Designers

Risk management is about maximizing your chances of project success by identifying risks early on and planning how to manage them. The following examples of risks will get you started down the path of risk identification.

Tips on Managing Project Risk written by: Therefore, managing project risk is critical. Risks exist for various reasons, such as inaccurate scope definition and management, unforeseen circumstances, and ineffective stakeholder management. As a matter of fact, project management risk can crop up from practically any project process. Follow these simple project management risk rules to ensure success with your project: Make It a Recurring Process During Project Kickoff, to reduce project management risk, you document project risks and make a list of risk mitigation strategies in a Risk Register. The risks identified will vary from project to project. However, the Risk Register will always need to be created at the start of a project. This is a critical aspect of managing project risk. When the project is executed, do not forget about the Risk Register. As a project manager, you are expected to update the Risk Register as the project progresses. This is what managing project risk is all about. Block your time once a week to review and update the Risk Register. This will reduce project management risk. Gather project risks from team members in the daily team meeting. This will help to train them in proactive project risks identification. Your team can help you reduce project management risk. Review the Risk Register with all stakeholders frequently. If you are following Agile Project Management practices, then an Iteration Kickoff can be used to identify project risks. Some project management methodologies have processes that are very effective in reducing project management risk. Managing project risk is a daily, 24X7 activity for the Project Manager. If all goes well, you will have a litany of project risks coming from various stakeholders. This is where managing project risk by risk quantification comes in handy. To quantify project risks, assign each risk a value out of 4 based on the probability of the risk occurring and the impact of the project risk on the project. For example, suppose you have identified the following project risks: Project Management Risk 1: The vendor will not be able to deliver on time given labor problems. Project Management Risk 2: For managing project risk, look at the first project risk, the probability of occurrence may be low if the vendor is located in a country that has few labor problems. However, the impact on the project will be high when the risk is materialized. Therefore, the project risk would be classified as high with a value of 3. You can manage project risk choosing a vendor in a location that does not have labor problems. Now, looking at the second project risk, the probability of occurrence is high and so is the impact. Therefore, managing project risk would involve assigning this risk the highest value 4. One way to mitigate this risk would be to use Agile Project Management practices. There are several other techniques used for managing project risk by risk quantification, which have not been discussed in this article. Tracking Managing project risk by tracking is about not losing focus. In the Risk Register, you would have mentioned a mitigation strategy for each risk. It is important to track all tasks associated with the risk mitigation to closure. This ensures reduced project management risk. It is similar to how you would track other project tasks and activities to closure. By following these risk management rules, your project will have reduced project management risk and you will be less likely to modify the Project Network Diagram Precedence Diagram during the course of the project.

Chapter 6 : Project management goal: Manage risk in your project - Project

All projects have risks. The key to managing a project is not to avoid risks, but to understand them. A risk is the possibility of an event or condition that would have a negative impact on a project. Risk management is the process of identifying, mitigating, and controlling the known risks in order.

Risk Management is the process of identifying, analyzing and responding to risk factors throughout the life of a project and in the best interests of its objectives. Proper risk management implies control of possible future events and is proactive rather than reactive. An activity in a network requires that a new technology be developed. The schedule indicates six months for this activity, but the technical employees think that nine months is closer to the truth. If the project manager is proactive, the project team will develop a contingency plan right now. They will develop solutions to the problem of time before the project due date. However, if the project manager is reactive, then the team will do nothing until the problem actually occurs. The project will approach its six month deadline, many tasks will still be uncompleted and the project manager will react rapidly to the crisis, causing the team to lose valuable time. Proper risk management will reduce not only the likelihood of an event occurring, but also the magnitude of its impact. I was working on the installation of an Interactive Voice Response system into a large telecommunications company. The coding department refused to estimate a total duration estimation for their portion of the project work of less than 3 weeks. My approach to task duration estimation is that the lowest level task on a project whose total duration is 3 months or more should be no more than 5 days. So… this 3 week duration estimation was outside my boundaries. Nevertheless, the project team accepted it. It appeared an unrealistic timeline for the amount of work to be done but they were convinced that this would work. No risk assessment was conducted to determine what might go wrong. Unfortunately, this prevented their ability to successfully complete their tasks on time. The system must also be able to quantify the risk and predict the impact of the risk on the project. The outcome is therefore a risk that is either acceptable or unacceptable. If risk management is set up as a continuous, disciplined process of problem identification and resolution, then the system will easily supplement other systems. This includes; organization, planning and budgeting, and cost control. Surprises will be diminished because emphasis will now be on proactive rather than reactive management. Risk Management…A Continuous Process Once the Project Team identifies all of the possible risks that might jeopardize the success of the project, they must choose those which are the most likely to occur. They would base their judgment upon past experience regarding the likelihood of occurrence, gut feel, lessons learned, historical data, etc. Early in the project there is more at risk then as the project moves towards its close. Risk management should therefore be done early on in the life cycle of the project as well as on an on-going basis. The significance is that opportunity and risk generally remain relatively high during project planning beginning of the project life cycle but because of the relatively low level of investment to this point, the amount at stake remains low. In contrast, during project execution, risk progressively falls to lower levels as remaining unknowns are translated into knowns. At the same time, the amount at stake steadily rises as the necessary resources are progressively invested to complete the project. The critical point is that Risk Management is a continuous process and as such must not only be done at the very beginning of the project, but continuously throughout the life of the project. Risk Response Avoidance…eliminating a specific threat, usually by eliminating the cause. Mitigation…reducing the expected monetary value of a risk event by reducing the probability of occurrence. Acceptance…accepting the consequences of the risk. This is often accomplished by developing a contingency plan to execute should the risk event occur. In developing Contingency Plans, the Project Team engages in a problem solving process. Contingency plans will help to ensure that they can quickly deal with most problems as they arise. Once developed, they can just pull out the contingency plan and put it into place. Why do Risk Management? The purpose of risk management is to: Provide a rational basis for better decision making in regards to all risks. Assessing and managing risks is the best weapon you have against project catastrophes. Additionally, continuous risk management will: Ensure that high priority risks are aggressively managed and that all risks are cost-effectively managed throughout the project. Provide management at all

levels with the information required to make informed decisions on issues critical to project success. There are many sources and this list is not meant to be inclusive, but rather, a guide for the initial brainstorming of all risks. By referencing this list, it helps the team determine all possible sources of risk. Various sources of risk include: Project Management Top management not recognizing this activity as a project Too many projects going on at one time Impossible schedule commitments No functional input into the planning phase No one person responsible for the total project Poor control of design changes Problems with team members.

Chapter 7 : Managing Geotechnical Risks in Design–Build Projects | The National Academies Press

Risk Analysis and Management is a key project management practice to ensure that the least number of surprises occur while your project is underway. While we can never predict the future with certainty, we can apply a simple and streamlined risk management process to predict the uncertainties in the projects and minimize the occurrence or.

One way of doing this is to make your best estimate of the probability of the event occurring, and then to multiply this by the amount it will cost you to set things right if it happens. This gives you a value for the risk: So the risk value of the rent increase is: This will help you to identify which risks you need to focus on. Gather as much information as you can so that you can accurately estimate the probability of an event occurring, and the associated costs. It may be better to accept the risk than it is to use excessive resources to eliminate it. Be sensible in how you apply this, though, especially if ethics or personal safety are in question. Avoid the Risk In some cases, you may want to avoid the risk altogether. This could mean not getting involved in a business venture, passing on a project, or skipping a high-risk activity. This is a good option when taking the risk involves no advantage to your organization, or when the cost of addressing the effects is not worthwhile. Remember that when you avoid a potential risk entirely, you might miss out on an opportunity. Conduct a "What If? Share the Risk You could also opt to share the risk â€" and the potential gain â€" with other people, teams, organizations, or third parties. For instance, you share risk when you insure your office building and your inventory with a third-party insurance company, or when you partner with another organization in a joint product development initiative. Accept the Risk Your last option is to accept the risk. For example, you might accept the risk of a project launching late if the potential sales will still cover your costs. Before you decide to accept a risk, conduct an Impact Analysis to see the full consequences of the risk. You may not be able to do anything about the risk itself, but you can likely come up with a contingency plan to cope with its consequences. Control the Risk If you choose to accept the risk, there are a number of ways in which you can reduce its impact. Business Experiments are an effective way to reduce risk. They involve rolling out the high-risk activity but on a small scale, and in a controlled way. You can use experiments to observe where problems occur, and to find ways to introduce preventative and detective actions before you introduce the activity on a larger scale. Preventative action involves aiming to prevent a high-risk situation from happening. It includes health and safety training, firewall protection on corporate servers, and cross-training your team. Detective action involves identifying the points in a process where something could go wrong, and then putting steps in place to fix the problems promptly if they occur. Detective actions include double-checking finance reports, conducting safety testing before a product is released, or installing sensors to detect product defects. Plan-Do-Check-Act is a similar method of controlling the impact of a risky situation. Like a Business Experiment, it involves testing possible ways to reduce a risk. Key Points Risk Analysis is a proven way of identifying and assessing factors that could negatively affect the success of a business or project. It allows you to examine the risks that you or your organization face, and helps you decide whether or not to move forward with a decision. You do a Risk Analysis by identify threats, and estimating the likelihood of those threats being realized. This may include choosing to avoid the risk, sharing it, or accepting it while reducing its impact. Subscribe to our free newsletter , or join the Mind Tools Club and really supercharge your career!

Chapter 8 : Project Management | Project Risk Identification for New Project Manager

Risk Management is the process of identifying, analyzing and responding to risk factors throughout the life of a project and in the best interests of its objectives. Proper risk management implies control of possible future events and is proactive rather than reactive.

Methods for dealing with such risks include Provision for adequate contingencies safety factors for budget and schedule contingencies are discussed in Chapter 6. Improvement in the work processes in order to reduce the uncertainties. Prefabrication of major components to avoid the uncertainties of construction at a job site is one example of changing the normal process to reduce risks although in this example the change may also introduce new risks, such as transportation of the components to the job site; thus the resolution of one risk may give rise to another. High Impact, Low Probability By definition, high-impact, low-probability events are rare occurrences, and therefore it is very difficult to assign probabilities to them based on historical records. Data do not exist and so subjective estimates of probabilities are necessary. However, the objective is not the scientific determination of accurate probabilities of rare events but the determination of what management actions should be taken to monitor, mitigate, and manage the risks. For example, if a certain risk is identified and management determines that some specific mitigation actions should be taken if the risk has a likelihood of more than 1 in of occurring, then a precise characterization of the probability is unnecessary; the only issue is whether it is assessed to be more than 1 in or less than 1 in Pareto Diagrams One of the important uses of a good risk analysis is to determine where to apply management resources and what to leave alone, as management resources are not unlimited. One approach is to break down the uncertainties into manageable parts. Pareto diagrams are one way to show the sources of uncertainty or impact in descending order. This form of presentation makes explicit those activities that have the greatest effect on the project completion date or cost and that therefore require the greatest management attention. The project director or manager must then determine whether the high-ranking events are 1 truly root causes or 2 simply work packages or activities that may reflect underlying causes but are themselves symptoms. The resulting analysis can provide guidance for managers to reduce, mitigate, buffer, or otherwise manage these sources of uncertainty. Page 28 Share Cite Suggested Citation: The National Academies Press. First, we estimate the uncertainty, or variance, in the cost of each individual work package. Second, we estimate the correlations or associations between each pair of work packages. Then, by elementary second-moment theory Benjamin and Cornell, , 1 the sensitivity of the uncertainty in the total project cost with respect to each work package is proportional to the combination of the activity uncertainties and the correlations between activities. That is, the uncertainty in the total cost is affected not only by the uncertainty in each work package but also by how much each work package affects, and is affected by, the others. As an elementary example, the uncertainty in the cost of a construction project may be more sensitive to outdoor activities than to indoor activities because unusually bad weather can cause a number of outdoor activities to run over budget and over schedule simultaneously, whereas indoor activities are typically not linked so tightly to the weather. By tabulating these values for all work packages, and sorting them from largest to smallest, we can identify those work packages with the largest sensitivities, which are those to which the project manager should give the highest priority. If we do this for a project of, say, 20 work packages and sort them according to the largest values of the sensitivities, we can then plot a Pareto diagram, as shown in Figure The absolute values of the sensitivities have no importance; the only concern is the relative values. Failure Modes and Effects Analysis In project risk assessment, a failure can be any significant event that the sponsor does not want to happenâ€"a budget overrun, a schedule overrun, or a failure to meet scope, quality, or mission performance objectives. While risks may arise from specific causes, they may also be the result of general environmental conditions that are not limited to specific times and places but are pervasive throughout the project. The objective of failure modes and effects analysis is the identification of root or common causes, which may affect the project as a whole. Often this identification is facilitated by methodically considering the project function by function, 1 All probability distributions may be characterized by their moments. Second-moment theory is the use of the second moments of probability distributionsâ€"that

is, means, variances, and covariances or correlation coefficients , instead of full probability distribution functions. As probability distributions are subjective and therefore not capable of precise definition, this approximate method can greatly simplify many calculations and, more importantly, provide the risk analyst with insight into the effects of uncertainty on project outcomes. Page 29 Share Cite Suggested Citation: Identification of potential risks that turn out, upon further assessment, to be negligible is a waste of time; however, failure to identify potential risks that turn out to be serious is a threat to the project. Therefore, the project director should err on the side of caution when identifying possible risks. Failure modes and effects analysis FMEA is a discipline or methodology to assist in identifying and assessing risks qualitatively. It is a method for ranking risks for further investigation; however, it is not a method for quantifying risks on a probabilistic basis Breyfogle, FMEA is typically based on a subjective assessment of the relative magnitudes of the impacts of the risk events on the project often on a scale from 1 to 10 , multiplied by the relative likelihood that the risk event will occur also on a scale from 1 to In addition, a third parameter may be included to assess the degree of warning that the project will have regarding the actual occurrence of the risk event again on a scale from 1 to This third parameter may give some management support by establishing early warning indicators for specific serious risks, which might not otherwise have been established. Page 30 Share Cite Suggested Citation: In the absence of more quantitative factors, such as sensitivity analysis, the failure modes, or better, all root causes, can be used to rank the risks. One can prepare a Pareto chart that shows the risks ordered by possible impact or by the combination of impact and likelihood of occurrence. Then risk mitigation efforts can first address the failure mode or root cause with the highest impact and work from there. The three factorsâ€"severity, likelihood, and leading indicatorsâ€"interact. For example, if the project is the construction of a facility in a flood plain or an area with poor drainage, then a failure mode could be flooding of the work site. Project management cannot affect the frequency of floods, so risk management must focus on trying to reduce the severity of the impact of a flood. If the control method is to reduce the severity of loss by placing sandbags around the perimeter and renting pumps, then measuring the water height may have little impact on the mitigation effort; but measuring the rainfall across the watershed may be more appropriate because it allows time to implement the control. If the control method is to build a cofferdam around the site before constructing anything else, then the choice of leading indicator may be irrelevant. Efforts to mitigate the risks will focus on the impact, likelihood, and detectability of the most serious risk or its root causes and will try to reduce these factors until this risk becomes as low as or lower than the next higher risk. As this process continues, the most important risks will be reduced until there are a number of risks essentially the same and a number of other risks all lower than the first group. The first group will require specific management actions and may require constant monitoring and attention throughout the project. The second group will be monitored, but with lower priority or frequency. The first group is considered the critical group, much like the critical-path activities in a network schedule; the second group is the noncritical group, which must be watched primarily to see that none of the risks from this group become critical. It should be emphasized that this form of risk assessment is qualitative and relative, not quantitative and absolute. It is primarily for distinguishing between risks that require follow-up and management, because of high impact or high likelihood or both , and risks that do not appear to require follow-up, because of both low impact and low likelihood. It should be clearly understood that there is no quantitative assessment of the overall risk to the total project: The analysis only identifies risk priorities in a methodical way to help direct further risk management activities. It is left to the judgment of the project engineers, designers, and managers to determine the appropriate risk mitigation and control measures to achieve an acceptable level of risk. Note especially that risks with a low likelihood of occurrence but very high severities may require follow-up and management action. Due to changes in project conditions or perceptions, even risks that appear to have low impact and high likelihood at one time may appear differently at another. The PDRI is used in front-end project planning to help the project team assess project scope definition, identify risk elements, and subsequently develop mitigation plans. It includes detailed descriptions of issues and a weighted checklist of project scope definition elements to jog the memory of project team participants. It provides the means to assess risk at various stages during the front-end project planning process and to focus efforts on high-risk

areas that need additional definition. Each risk element in the PDRI has a series of five predetermined weights. Once the weights for each element are determined they are added to obtain a score for the entire project. This score is statistically correlated with project performance to estimate the level of certainty in the project baseline. It cannot be repeated too often that the purpose of risk assessment is to be better able to mitigate and manage the project risksâ€"not just to compute project risk values. The assessment of risks attributed to elements completely out of project management controlâ€"such as force majeure, acts of God, political instability, or actions of competitorsâ€"may be necessary to reach an understanding of total project risk, but the risk assessment should Page 32 Share Cite Suggested Citation: It is often desirable to combine the various identified and characterized risk elements into a single quantitative project risk estimate. Owners may also be interested in knowing the total risk level of their projects, in order to compare different projects and to determine the risks in their project portfolios. See the discussion of program risk and project portfolios in Chapter 8. This estimate of overall project risk may be used as input for a decision about whether or not to execute a project, as a rational basis for setting a contingency, and to set priorities for risk mitigation. While probabilistic risk assessment methods are certainly useful in determining contingency amounts to cover various process uncertainties, simple computation methods are often as good as, or even better than, complex methods for the applications discussed here. When addressing probabilistic risk assessment, project directors should keep in mind that the objective is to mitigate and manage project risks and that quantitative risk assessment is only a part of the process to help achieve that objective. There are many available methods and tools for quantitatively combining and assessing risks. Some of the most frequently used methods are discussed briefly below. Multivariate Statistical Models Multivariate statistical models for project costs or durations are derived from historical data. Also known as regression analysis, statistical models are one of two methods of analysis explicitly cited in OMB Circular No. The models are typically either top-down or parametric and do not contain enough detail to validate bottom-up engineering estimates or project networks. These methods are objective in that they do not rely on subjective probability distributions elicited from possibly biased project advocates. Analysts build linear or nonlinear statistical models based on data from multiple past projects and then compare the project in question to the models. The use of such statistical models is desirable as an independent benchmark for evaluating cost, schedule, and other factors for a specific project, but statistically based methods require a large database of projects, and many owners do not perform enough projects or expend the effort to create such databases. Owners who have performed many projects but have not developed usable historical project databases have an opportu- Page 33 Share Cite Suggested Citation: Computational methods such as resampling and bootstrapping are also used when data are insufficient for direct statistical methods. The bootstrap method is a widely used computer-based statistical process originally developed by Efron and Tibshirani to create a proxy universe through replications of sampling with replacement of the original sample. Bootstrapping is used to estimate confidence levels from limited samples but is not applicable for developing point estimates. Event Trees Event trees, also known as fault trees or probability trees, are commonly used in reliability studies, probabilistic risk assessments for example, for nuclear power plants and NASA space probes , and failure modes and effects analyses. The results of the evaluations are the probabilities of various outcomes from given faults or failures. Each event tree shows a particular event at the top and the conditions causing that event, leading to the determination of the likelihood of these events. These methods can be adapted to project cost, schedule, and performance risk assessments. System Dynamics Models Projects with tightly coupled activities are not well described by conventional project network models which prohibit iteration and feedback. Efforts to apply conventional methods to these projects can lead to incorrect conclusions, counterproductive decisions, and project failures. In contrast, system dynamics models Forrester, describe and explain how project behavior and performance are driven by the feedback loops, delays, and nonlinear relationships in processes, resources, and management. Because system dynamics models are based on dynamic feedback the models can also be used to evaluate the impacts of various failure modes or root causes, particularly in cases where the root causes can be identified but the ripple effect of their impacts is difficult to estimate with any confidence. System dynamics models have been effectively used for project evaluation, planning, and risk assessment Cooper, ; Lyneis, Cooper, and

Els, ; Ford and Sterman, Although the use of these models is not standard practice for project planning and risk management, they can significantly help owners to improve their understanding of project risks. Page 34 Share Cite Suggested Citation: A sensitivity coefficient is a derivative: Even if the probability of a particular risk cannot be determined precisely, sensitivity analysis can be used to determine which variables have the greatest influence on the risk. Because a primary function of risk analysis is to break down the problem into essential elements that can be addressed by management, sensitivity analysis can be very useful in determining what decisions the manager should make to get the desired resultsâ€"or to avoid undesired results. In the absence of hard data, sensitivity analysis can be very useful in assessing the validity of risk models.

Chapter 9 : Project risk management - Wikipedia

The guidelines provide five strategies for aligning a transportation agency and its design-builder's perception of geotechnical risk as well as 25 geotechnical risk management tools that can be used to implement the strategies on typical design-build projects.

Less Risk in a project is determined by two things: The negative outcome of a project activity. The likelihood that the outcome will occur. But because a power failure is unlikely, the risk can be safely ignored. A more reasonable risk to plan for might be the unavailability of a print shop for a more complex, high-quality shareholder report. For this risk, the project manager should schedule more time for report printing. For more articles in this series of project management instructional guides, see The project management road map. Project management tips before you start. Examples of activities with high risk Here are some typical activities and events that can increase risk in a project. Risky Activity Description Critical tasks Pay close attention to tasks that are on the critical path. They have more risk because they have the greatest impact on the end date of the project. Vendor tasks When you contract with a vendor, request more frequent or detailed progress reports than you would with your own team members. Vendor tasks that occur at the end of a project have more risk than vendor tasks at other times. Vendors include both contracted people outside your company as well as employees from other areas of your company. Because both are further out of your control than people on your own team, both should be treated the same in terms of risk to a project outcome. Inexperienced team members Assigning inexperienced workers assigned to work at the end of the project endangers the end date of the project because they might need more ramp-up time. Minimize this risk by scheduling sufficient ramp-up time for new workers. Too many tasks occurring at the same time Check for an excessive number of tasks scheduled at the same time. Even if these tasks are being performed by different people, too many of them occurring at the same time creates risk in your project--especially toward the end of the project. Designing a schedule in the right order Beginning project managers make the mistake of linking task before outlining them. This can lead to a confusion and lot of backtracking. When you start a new project, list and group tasks first so that you see the entire scope of the project and its deliverables. Then, you can start linking tasks to arrive at the ideal schedule. Projects often end with closing documents for the purpose of minimizing repeated risks to future projects. How to manage risks Here are tricks-of-the-trade project managers use to handle project risks. Avoid the risk If a project activity results in serious consequences, avoidance is a good policy. For example, using a manufacturing processes at the same time for two deliverables can put project timing at. Instead, a project manager can avoid the risk by using the manufacturing process sequentially. Mitigate the risk Find ways to reduce the likelihood of a risk. For example, you might decide to use a simplified and well-understood manufacturing process if a more innovative and costly one will take too long to install. Transfer the risk Control risk by transferring it to an external vendor. For example, if the documentation of a computer sub-system is too large in scope for internal resources to complete on time, contract portions of it to an external vendor. Learn from the risk Not all risk is bad. Risk can also open the door to opportunity. For example, if after exploring risks in your project, you realize that a software sub-system being developed as part of a larger manufacturing process is itself marketable, you might decide to reassign your best engineers onto further developing the sub-system. Taking experienced engineers off a project creates additional risk in your project, but in this case it might be offset by the opportunity gained.