**AFRICA CENTRE FOR PROJECT MANAGEMENT**

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**MODULE FIVE ASSIGNMENT WORK**

**1. Explain briefly the types of project organization**

Project organization is a process, which provides the arrangements and decisions about the realization and the process of the [project](https://www.inloox.com/project-management-glossary/project/). Such tasks as organization of the project process, planning of the project frameworks (costs, deadlines, personnel etc.) should be carried out; all project requirements should be given to the [project stakeholders](https://www.inloox.com/project-management-glossary/project-stakeholder/) during this process. Generally, the project organization is the structuring, organization and configuration as well as project process according to the plan. It provides the teamwork of the participants proceed as efficient as possible according to the inserted rules, [standards](https://www.inloox.com/project-management-glossary/standard/) and values of the project. The roles and [responsibilities](https://www.inloox.com/project-management-glossary/responsibility/) are divided, the rules of the teamwork are determined and the information system is defined during the project organization.

George R. Terry defines a project organization as “A project organization is a preferred means whenever a well-defined project must be dealt with or the task is bigger than anything, the organization is accustomed to.”

A Project Organization defines the human infrastructure, and identifies roles and responsibilities of each position that facilitates the coordination and implementation of project activities. One of the important decisions of project management is the form of [organizational](http://www.theprojectdefinition.com/organisation/) structure that the team members with a minimum missing, overlaps and conflict. The success of project depends on its organizational structure, key personnel capability, and management work process in which where decision is made. The Project Organization can be structured as a [Functional Structure Organization,](http://www.theprojectdefinition.com/functional-organisation/) [Project TF (Task force) (traditional Hierarchical) Structure Organization](http://www.theprojectdefinition.com/project-tf-task-force-organisation/), and [Matrix Structure Organization](http://www.theprojectdefinition.com/matrix-organization/). The Project Organization can be evaluated different options based on the project environmental, company needs, assigned personnel capabilities ensuring efficiency, productivity, operational effectiveness.

A project organization is a structure that facilitates the coordination and implementation of project activities. Its main reason is to create an environment that fosters interactions among the team members with a minimum amount of disruptions, overlaps and conflict. One of the important decisions of project management is the form of organizational structure that will be used for the project.

Each project has its unique characteristics and the design of an organizational structure should consider the organizational environment, the project characteristics in which it will operate, and the level of authority the project manager is given. A project structure can take on various forms with each form having its own advantages and disadvantages.

One of the main objectives of the structure is to reduce uncertainty and confusion that typically occurs at the project initiation phase. The structure defines the relationships among members of the project management and the relationships with the external environment. The structure defines the authority by means of a graphical illustration called an organization chart.

A properly designed project organization chart is essential to project success. An organization chart shows where each person is placed in the project structure. An organization chart is drawn in pyramid form where individuals located closer to the top of the pyramid have more authority and responsibility than members located toward the bottom.

It is the relative locations of the individuals on the organization chart that specifies the working relationships, and the lines connecting the boxes designate formal supervision and lines of communication between the individuals.

Creating the project structure is only a part of organizing the project; it is the actual implementation and application that takes the most effort. The project organization chart establishes the formal relationships among project manager, the project team members, the development organization, the project, beneficiaries and other project stakeholders. This organization must facilitate an effective interaction and integration among all the major project participants and achieve open and effective communication among them.

The project manager must create a project structure that will meet the various project needs at different phases of the project. The structure cannot be designed too rigid or too lose, since the project organization's purpose is to facilitate the interaction of people to achieve the project ultimate goals within the specified constraints of scope, schedule, budget and quality. The objective in designing a project structure is to provide a formal environment that the project manager can use to influence team members to do their best in completing their assignment and duties. The structure needs to be designed to help develop collaboration among individual team members; all in a cost effective way with a minimum of duplication of effort and overlaps.

The organization chart has a limited functionality; it only shows the hierarchical relationship among the team members but does not shows the Project Management Structures how the project organization will work, it is for that reason that the design should consider factors that will facilitate the operation of the structure; these include communications, information flows, coordination and collaboration among its members.

The project organization is divided into three areas of competence and responsibility. The [project leadership](https://www.inloox.com/project-management-glossary/project-leadership/) is responsible for the whole [management of the project](https://www.inloox.com/project-management-glossary/project-management/) and the [project team](https://www.inloox.com/project-management-glossary/project-team/) implements the actual project. The third area is a [project board](https://www.inloox.com/project-management-glossary/steering-committee/), which is a supreme decision-making body, can define the project successes or cancel a project.

There are three different organization forms which were well known. Functional organization is one of the types of Organization; Project Organization becomes the second type and lastly the Matrix organization.

**Functional Organization:**

This type of organization is grouped by different areas of specialization within different functional areas such as accounting, marketing, purchase, and so on. Projects in these types of organizations are usually taken up in a single department and the team members may be loaned to these projects from time to time. Team members are expected to take up departmental work in addition to their project work. Each department in a functional organization will do its project work independently of other departments. If any information is needed from another department, request is sent by the head of the department which is implementing the project to the head of the department from whom the information is needed.

In a functional organization the functional or departmental manager is in charge. The project budget is usually managed by the functional manager. The project manager has low influence or power or he could even be a part time employee.

Some of the advantages of a functional type of organization are

* Well defined career paths for the team members in their areas of specialization.
* Deeper company expertise by function.
* Team members usually report to one single supervisor.
* Similar resources are centralized as the company is grouped by specialties.

Some of the disadvantages of a functional type of organization are

* The project manager has very little or no authority.
* Functional organizations lack career paths in project management.
* Priorities on the projects are lower and people place more emphasis on their functional specialty to the detriment of their project.

**Project Organization:**

In a project organization, the entire company is structured according to projects instead of functional departments. Team members are often collocated and most of the company's resources are allocated to project work. In these types of organizations, the project manager is highly empowered. These are mostly found in consulting environments. People are assigned and report to a project manager. Once the projects are over, the team members are assigned to another project or they need to find work with a different employer. All the communication occurs within the project. In a project organization environment, the project manager has the highest level of control.

Some of the advantages of a project organization are:

* In a project organization, the project manager has complete authority.
* Loyalty is strong, to both the team and the project.
* Since everyone is on a single team, project communications are easier and they are more efficient in comparison to functional organizations.

Some of the disadvantages of a project organization are:

* Project 'team members ' work themselves out of a job and may have no 'home' when the project is completed.
* Professional growth could be difficult in a project organization.
* In a project organization, team members only belong to a project - not to a functional area.

**Matrix:**

In a matrix type of an organization, individuals report to both the functional manager for human resources and a project manager for projects. Team members are required to perform project work in addition to departmental work. Matrix organizations are classified as weak, balanced and strong depending upon the relative level of power and influence between functional managers and project managers.  
  
Weak Matrix: In a weak matrix, the functional manager has more authority. In such a type of organization, the project managers’ role is more of a project expeditor or a project coordinator. The project expeditor acts primarily as a staff assistant and communications coordinator. The expeditor cannot personally make or enforce decisions. The project coordinator is similar to the project expeditor except that the project expeditor has some power to make decisions and reports to a higher level manager.

Balanced Matrix: In a balanced matrix, power is shared evenly between functional and project managers. However, the Project Manager does not have full authority over the project, project staff or project budget.

Strong Matrix: In a strong matrix, power rests with the project manager. In a matrix organization, the power is shared between project managers and functional managers. They have full-time Project Managers and project administrative staff. Project Managers have considerable authority over the project in this organizational structure.

Some of the advantages of a matrix type of an organization are:

* In Matrix type of organizations, project managers could gain deep expertise of a functional organization, while still being empowered to manage the resources on a project.
* In a Matrix type of organizations, you could have maximum utilization of scarce resources.

Some of the disadvantages of a matrix type of organization are:

* Since team members in matrix type of organizations have two bosses, it could sometimes cause conflicts and confusion.
* In these types of organizations, overheads could be more due to duplication of many tasks.
* Projects in these types of organizations are tougher to monitor and control.

**2. What are the phases available in project portfolio process?**

Portfolio is “a collection of projects or programs and other work that are grouped together to facilitate effective management of that work to meet strategic business objectives. The projects or programs of the portfolio may not necessarily be independent or directly related”. (PMI 2006, p.4)

Project portfolio is a group of projects which is considered as a structured, proactive (Voss and Kock, 2013), combined (Payne and Turner, 1999), adaptive (Sanchez and Robert, 2010) and an effective management system where number of projects are constantly added, revised and managed effectively and efficiently (Martinsuo and Lehtonen, 2007; Amaral and Araujo, 2009; Pennypacker and Dye, 2000). Managing a single project has its own importance, but not sufficient for an efficient portfolio (Martinsuo and Lehtonen, 2007; Biedenbach and Müller, 2012).

Appropriate project mix is essential for the achievement of organizational goals (Canbaz and Marle, 2016). Amaral and Araujo (2009) stated that organizations have multiple options of a new project to select within the existing physical and financial constraints. New innovative projects interact with already existing projects for their resources and schedule.

Organizational strategic direction should be clear before considering a project for portfolio (Archer and Ghasemzadeh, 1999). So, updating and revision of the projects should be made after careful assessment of every detail according to the organizational strategy, which would be helpful to achieve the PP and organizational strategic objectives (Meskendahl, 2010; Amaral and Araujo, 2009; Archer and Ghasemzadeh, 1999). Project Portfolio is considered as an important tool to implement the organizational strategy (Dietrich and Lehtonen, 2005; Meskendahl, 2010).

This requires high quality advanced preparation, possibly through the utilization of a marketing portfolio approach. It is wise to develop a flexible strategy, where it is possible to monitor the market conditions and the overall performance of the organization (Amaral, 2009).

According to Levine, there are five distinct phases in the project portfolio process, as Portfolio Inventory, Portfolio Analysis, Planning, Tracking and Review and Re-planning. Other authors have used similar divisions of the processes. Nevertheless of the divisions and names of the phases or processes, they are agreed on that the project portfolio process is dynamic, iterative, and ongoing and must be managed artfully depending on project life cycles as well as organizational issues, like budget cycle (Levine, 2005).

However, I based my description of the project portfolio process on PMI (2006, pp.23-41) because it illustrates the process in a chronological way that can be applied within any portfolio types and organizations. They even provide the mandatory information regarding inputs and output for each stage and possible tools, techniques (methods) that utilities the portfolio decisions.

A strategic portfolio management system requires a portfolio management process. This usually involves a step-by-step process which includes:

**1.   Create an Inventory and Establish a Strategy**

First, identify all the projects in the pipeline by gathering key project and organizational information. Categorize these, identify your company’s strategic goals and determine if these projects support those strategic objectives, and if so, which ones.

Business strategies are the basis of Project Portfolio Management and as such, it is important to have a strategy in mind before proceeding. Preparing answers to common questions you expect to get during this phase is also advisable. Common questions can be anything from “What is project portfolio management?” to “How much will this cost the company?” to “How will this benefit us?” and even “Why do we need project portfolio management?” It’s always good to be prepared. Establish what you would like your process for prioritizing projects to be like.

After you’ve set a strategy, you need to build an implementation team. Your implementation team should include technical team members (to help with new systems) and portfolio managers, to name a few. Your implementation team may need a governing body, which is typically made up of senior management.

**2.   Analyze**

Next, analyze the current strengths and weaknesses of your Project Portfolio. Evaluate each project individually project milestones, potential Return on Investment, reporting schedule and resource allocation. After collecting data, it’s generally a good idea to organize it by category. These categories can be anything you think is necessary, but generally, include completed and canceled projects and growth and survival categories. In conducting this analysis, you should ask questions that aim to reveal whether there is duplication or whether some existing projects might not be better combined for the sake of efficiency or even halted completely. You should also assess the overall risk of the project portfolio as a whole by comparing the probability of technical success against the anticipated benefit from the project. Remember to have a good communication process in place so that all the key variables are thoroughly discussed.

**3.   Ensure Alignment**

Next, perform an [alignment analysis](https://www.pmi.org/learning/library/proven-project-portfolio-management-process-8503) that will show you whether your critical resources are working on critical projects and whether the projects you do decide to carry on with really align with all the strategic initiatives the company wants to undertake. Some of your guiding principles should include:

* The degree of the strategic fit between the portfolio and the company. You need a balance between near-term growth opportunities, long-term goals, and the quest for long term innovation.
* Ensuring the distribution of projects, including the number and nature of the projects, are aligned to different strategic goals in a way that makes economic sense.
* The probability that the end product will deliver the return expected.
* An evaluation of associated risks. It is important to take a broad inclusive approach to risk and not only measure in financial terms, but include schedule, scope resource and technology risks

**4.   Management**

Next comes, the management aspect of the process. At this point, you need to view the project portfolio and make necessary decisions about reallocation of budgets and resources, or reprioritization based on information you uncovered during the previous legs of the process. You may also need to reschedule projects which you may have decided to keep, but who scheduling risk does not quite align with your strategy. Obviously, collaboration is absolutely critical before making these decisions and ending up with the right portfolio. In the end, your portfolio should have a healthy mixture of risk and reward and should meet internal requirements.

**5.   Test and Adapt**

Lastly, test and adapt. There is no guarantee you will get your project portfolio management process right immediately, and in fact you shouldn’t expect to. You will need to adapt and make changes as you go. What adaptation means is quite different for every company, as it should be, but it’s generally a good idea to test your new portfolio with a few stakeholders, taking feedback as needed. Project portfolio can be quite a complex process, especially in the beginning. There are project portfolio management templates and Portfolio and project management software that can help.

**3. Explain the term risk management**

Risk management is the identification, evaluation, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability or impact of unfortunate events or to maximize the realization of opportunities.

Project risk management is the systematic process of identifying, quantifying, analyzing, and responding to project risk. It includes maximizing the probability and consequences of positive events and minimizing the probability and consequences of adverse events to project objectives. This is an extremely important aspect of project management that sometimes is overlooked by novice project managers.

Project risk management begins early in the life cycle. A clear understanding of the risks that face the project must be established. The sources of project risk are almost limitless, emphasizing the need for a well-thought-out, detailed plan. Typical examples include the loss of a key team member, weather emergencies, technical failures, and poor suppliers. This introduces general concepts of risk and briefly discusses what should be done early in the process.

Risk management plays a critical role in project planning. There are factors or actions waiting to impede projects, and risk management initiatives will anticipate obstacles and put plans into place to overcome them. Potential risks must be identified and prioritized, and strategies developed to minimize or avoid the risk. Project managers must realize that time must be allotted for risk management planning to maximize the negative happening on projects.

Risk management at project level is most often focused on individual risks that, should they occur, will affect the project’s objectives. It is, however, also important for the project manager to understand the overall risk exposure of the project, so that this can be reported to the project sponsor and other stakeholders.

Risk management must be closely aligned to schedule management. Cost, time and resource estimates should always take risks into account. The project manager is accountable for ensuring that risk management takes place. Depending on the size and complexity of the project, a specialist risk manager may be appointed to oversee and facilitate the risk management process.

In the financial world, risk management is the process of identification, [analysis](https://www.investopedia.com/terms/r/risk-analysis.asp) and acceptance or mitigation of uncertainty in investment decisions. Essentially, risk management occurs when an investor or fund manager analyzes and attempts to quantify the potential for losses in an investment, such as a [moral hazard](https://www.investopedia.com/ask/answers/042415/what-difference-between-moral-hazard-and-adverse-selection.asp), and then takes the appropriate action (or inaction) given his investment objectives and [risk tolerance](https://www.investopedia.com/articles/pf/07/risk_tolerance.asp).

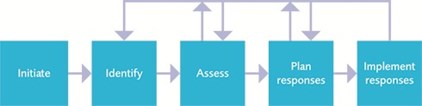
Risk management occurs everywhere in the financial world. It occurs when an investor buys low-risk government bonds over riskier corporate bonds, when a fund manager hedges his currency exposure with currency [derivatives](https://www.investopedia.com/terms/d/derivative.asp), and when a bank performs a credit check on an individual before issuing a personal line of credit. Stockbrokers use financial instruments like [options](https://www.investopedia.com/terms/o/option.asp) and [futures](https://www.investopedia.com/terms/f/futures.asp), and money managers use strategies like portfolio and investment diversification to mitigate or effectively manage risk.

Inadequate risk management can result in severe consequences for companies, individuals, and the economy. For example, the [subprime mortgage meltdown](https://www.investopedia.com/terms/s/subprime-meltdown.asp) in 2007 that helped trigger the Great Recession stemmed from poor risk-management decisions, such as lenders who extended mortgages to individuals with poor credit, investment firms who bought, packaged, and resold these mortgages, and funds that invested excessively in the repackaged, but still risky, [mortgage-backed securities (MBS)](https://www.investopedia.com/terms/m/mbs.asp).

All projects, programmes and portfolios are inherently risky because they are unique, constrained, based on assumptions, performed by people and subject to external influences. Risks can affect the achievement of objectives either positively or negatively. Risk includes both opportunities and threats, and both should be managed through the risk management process.

Risk is defined at two levels for projects, programmes and portfolios. At the detailed level, an individual risk is defined as ‘an uncertain event or set of circumstances that, should it occur, will have an effect on achievement of one or more objectives’. In addition, at the higher level of the project, programme or portfolio, overall risk is defined as ‘exposure of stakeholders to the consequences of variation in outcome’ arising from an accumulation of individual risks together with other sources of uncertainty.

The high-level process, as illustrated here below starts with an initiation step that defines the scope and objectives of risk management. A key output from the initiation step is the risk management plan, which details how risk will be managed throughout the life cycle.



**Figure: Risk management process**

Risks are then identified and documented in the risk register. The relative significance of identified risks is assessed using qualitative techniques to enable them to be prioritized for further attention. Quantitative risk analysis may also be used to determine the combined effect of risks on objectives.

The process continues with risk response planning, aiming to avoid, reduce, transfer or accept threats as well as exploit, enhance, share or reject opportunities, with contingency (time, cost, resources and course of action) for risks which cannot be managed proactively. The final step is the implementation of agreed responses.

The whole process is iterative. For example, assessment or response planning can lead to the identification of further risks; planning and implementing responses can trigger a need for further analysis, and so on.

It is also important to identify and manage behavioral influences on the risk process, both individual and group, since these can have a significant impact on risk management effectiveness.

Risk management at project, programme or portfolio level must not be conducted in isolation and must interface with the organisation. Risks at project level may need escalation to programme and portfolio. Risks can also be delegated from higher levels to lower levels.

In addition, risk management must contribute, as appropriate, to both business risk assessments and organizational governance requirements. The project manager must be aware of risks that have an effect outside their scope of responsibility, for example, those that could affect the organization’s reputation.

The management of general health and safety risks is usually excluded from risk management, as the management of these risks is traditionally handled by a separate function within the organisation.

Risk management at project level is most often focused on individual risks that, should they occur, will affect the project’s objectives. It is, however, also important for the project manager to understand the overall risk exposure of the project, so that this can be reported to the project sponsor and other stakeholders.

Risk management must be closely aligned to schedule management. Cost, time and resource estimates should always take risks into account.

The project manager is accountable for ensuring that risk management takes place. Depending on the size and complexity of the project, a specialist risk manager may be appointed to oversee and facilitate the risk management process.

The programme will establish a common framework and standards for risk management across the programme. This will enable comparison of risk, reduce the time taken to initiate management processes at project level, and help identify interdependencies between risks across the programme. The common framework will be set out in the programme risk management plan.

Programme risk management addresses any individual risks at project level that, if realized, will have a wider impact. Project risks that cannot be effectively managed within projects and within contingency are escalated to the programme for attention and/or action. In addition, related or common risks within individual projects may combine or aggregate to have an effect at programme level, in which case they also need to be escalated.

Programme risk management also considers any risks delegated from the portfolio or strategic level, as well as risks arising directly at the level of the programme itself. Programme risks are likely to focus on prioritization of programme components, allocation of resources, interfaces and interactions between programme components, the ability to deliver change management activities within the programme, and cumulative risks arising from the combined impact of the project risks.

Risks at portfolio level are often of such scale that they may have significant impact on the ability of the organisation to operate. Portfolio risk management will focus on two areas:

* Risks escalated from projects or programmes and from areas of day-to-day business;
* Risks that impact upon the objectives of the portfolio and the host organization.

Project and programme risks that cannot be effectively managed at their originating level may be escalated to the portfolio for responses unavailable at project or programme level.

The portfolio will establish common frameworks and standards for risk management, which will be cascaded to projects and programmes to ensure a common approach and reporting structure. This enables effective comparison of risk, reduces the time taken in initiating risk management processes, and assists with identification of potential conflict in selected responses across the portfolio.

The consideration of risk efficiency is of particular importance to portfolio risk management. The principles of risk efficiency have been established in financial portfolios for many years. They are equally relevant to portfolios of projects and programmes. Ensuring that the portfolio does not expose an organization to too much risk and is efficient is an important function in the ‘balance’ phase of the portfolio life cycle.

**4. How are projects cushioned from risk?**

Projects are risky undertakings, and modern approaches to managing projects recognize the central need to manage the risk as an integral part of the project management discipline. Managing Risk in Projects places risk management in its proper context in the world of project management and beyond, and emphasizes the central concepts that are essential in order to understand why and how risk management should be implemented on all projects of all types and sizes, in all industries and in all countries. The generic approach detailed by David Hillson is consistent with current international best practice and guidelines (including 'A Guide to the Project Management Body of Knowledge' (PMBoK) and the 'Project Risk Management Practice Standard' from PMI, the 'APM Body of Knowledge' and 'Project Risk Analysis & Management (PRAM) Guide' from APM, 'Management of Risk: Guidance for Practitioners' from OGC, and the forthcoming risk standard from ISO) but David also introduces key developments in the risk management field, ensuring readers are aware of recent thinking, focusing on their relevance to practical application. Throughout, the goal is to offer a concise description of current best practice in project risk management whilst introducing the latest relevant developments, to enable project managers, project sponsors and others responsible for managing risk in projects to do just that effectively.

Risk can be faced by project team, however confident you are that your project will be a success; there is always a chance that something might go wrong. 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. Creating a list of risks is a good starting point, but it is not enough in itself. 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: acceptance, avoidance, transference, mitigation or exploitation. Here’s a detailed look at each of them.

**1. 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.

This is a good strategy to use for very small risks – risks that won’t have much of an impact on your project if they happen and could be easily dealt with if or when they arise. It could take a lot of time to put together an alternative risk management strategy or take action to deal with the risk, so it’s often a better use of your resources to do nothing for small risks.

**2. Avoid the Risk**

You can also change your plans completely to avoid the risk. Avoid risk is a good strategy for when a risk has a potentially large impact on your project. For example, if January is when your company Finance team is busy doing the corporate accounts, putting them all through a training course in January to learn a new process is not going to be a great idea. There is a risk that the accounts would not get done. It’s more likely, though, that there’s a big risk to their ability to use the new process, since they will all be too busy in January to attend the training or to take it in even if they do go along to the workshops. 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.

**3. Transfer the Risk**

Transference is a risk management strategy that isn’t used very often and tends to be more common in projects where there are several parties. 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. The project team acknowledges that the accident might happen, but they won’t be responsible for dealing with sourcing replacement kit, moving it to the right location or paying for it as that is now the responsibility of the insurance company.

**4. Mitigate the Risk**

Mitigating against a risk is probably the most commonly mitigation of risk used risk management technique. It’s also the easiest to understand and the easiest to implement. 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. For example, if you are launching a new washing machine and the Sales teams then have to demonstrate it to customers, there is a risk that the Sales teams don’t understand the product and can’t give good demonstrations. 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. There could still be a chance that some team members do not understand the product, or they miss the training session, or they just aren’t experts in washing machines and never will be, but the impact of the risk will be far reduced as the majority of the team will be able to demonstrate the new machine effectively. You can mitigate against the impact, like in this example, and you can also mitigate against the likelihood of it happening. Sometimes the actions will be broadly the same; sometimes you’ll have to have some tasks to reduce the chance that the risk happens and some separate tasks to make the impact of the risk smaller if it happens.

**5. 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? For example, the risk that the new washing machines are so popular that we don’t have enough Sales staff to do the demonstrations? That’s a positive risk something that would have a benefit to the project and the company if it happened. 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 can be used to manage risk on the project. You will probably find yourself using a combination of techniques, choosing the strategies that best suit the risks on your project and the skills of your team. 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.

Here, we can see a scenario about Becky; Becky’s hair company has grown substantially over its first 5 years and now has $20,000 of assets. Becky is considering investing in stock from Apple, but she is unsure how much she should invest. Becky, being the smart business owner that she is, decides to perform a risk analysis. The risk assessment reveals to Becky that the Apple stock is very risky for new investors at the moment. In addition, the stock is price is high making any potential dividends in the short term are extremely limited. Thus, she would need to be able to devote a substantial amount of her remaining savings in order to receive an adequate dividend. For these reasons, Becky decides not to invest in the Apple stock and instead invest her savings in new equipment that would allow her to hire another hairdresser and increase sales.

**5. Why is it important to plan for risk in execution of any project?**

Many project managers attempt to deal with risks on an informal basis with little or no prior planning. Any project manager who operates in this manner is inviting failure, if not disaster. These are strong words, but appropriate for an important topic. A formal, comprehensive project risk plan allows the project manager to be proactive regarding the innumerable things that can and do go wrong with a project. Without this plan, you are forced to manage reactively when things go wrong easily the most expensive approach. A systematic process adds discipline and efficiency when creating the plan.

Project planning plays an essential role in helping guide stakeholders, sponsors, teams, and the project manager through other project phases. Planning is needed to identify desired goals, reduce risks, avoid missed deadlines, and ultimately deliver the agreed product, service or result. Without careful planning, project performance is almost certainly guaranteed to suffer.

More so, many project managers wait too long to assess risk factors and delay the risk plan because they assume they don’t know enough yet, that there are too many unknowns. This is a common trap that you should try to avoid. During the initiation phase of the project life cycle, an initial high-level assessment ought to be conducted. You and your team members should take a strategic approach to “what can go wrong” and begin laying the foundation for the detailed plan to follow. Without this foundation, projects often experience the negative impact of risks that become reality, risks that might have been prevented or mitigated through contingency planning.

This is reactive behavior, and you must live in the proactive world to be successful as a project manager. Potential opportunities are sometimes referred to as positive risks, where the project manager strives to optimize the positive impact on project objectives.

The Project Management Institute [estimates](https://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/pulse/pulse-of-the-profession-2017.pdf) that as of 2017, organizations were wasting an average of $97 million for every $1 billion invested, due to poor project performance.

Project risk management is identified as one of the nine knowledge areas of the PMBOK® Guide. The PMBOK® Guide describes project risk management as “the process of conducting risk management planning, identification, analysis, response planning, and monitoring and control on a project.” By definition, a process can be considered a formal, controlled undertaking with little or no variation. When applied to processes, variation often equals inefficiency. It is important for the project manager to manage risks formally by applying an agreed-upon process to establish the risk management plan. Given the realities and variables of the typical project environment, a certain amount of flexibility is appropriate. As you gain experience in managing risks, an intuitive feel for flexibility will develop depending upon style and the length, width, depth, and breadth of the projects.

There are six-step processes which are common and practical approach to establishing the project risk plan. This process should not be created in a vacuum but typically involves a great deal of research and collaboration with the project team. Here below are the details of the processes:

**Step 1: Make a List**

It’s good for the project team to brainstorm about the risk to happen. Making a list of potential risks to the project should not be an analysis but a formal brainstorming session, when all ideas are captured. Steps 2 and 3 of the process allow for a vetting of these ideas. It is important that the entire team get involved in identifying threats and highlighting what can go wrong. Some project managers make the mistake of trying to accomplish this on their own to allow team members to complete other tasks. This is shortsighted and a bad idea. This initial step of the process must be collaborative and involve the individuals who are expert at that portion of the project work for which they are responsible. Leverage the intellectual capital (smarts) that is your team. If one or more members are left out, it is likely that some risks will remain unidentified and pose a threat to project success. Remember, involve everyone a procurement specialist will not be helpful in identifying potential software development problems, and vice versa.

When you work with the support of an informal team, you will need to be disciplined and realize that a certain amount of research is necessary before moving forward. This may include phone calls, e-mails, office visits, or videoconferencing whatever it takes to elicit the information you need. You typically start with the informal team members or contributors to the project and initiate a dialogue as to what might go wrong. Usually, these discussions identify other ancillary individuals who should be contacted. Functional department managers can be very helpful in these circumstances, either assisting directly or identifying others in their department who can.

In either case, project manager should take a holistic approach to establishing the list, as all types of risks will need to be identified and dealt with accordingly.

**Steps 2 & 3: Determine the Probability of Risk Occurrence and Negative Impact**

I am combining steps 2 and 3 because they are the prioritization factors. They assist project managers in vetting the list of risks. These two steps allow you to prioritize all identified threats to the project and help you determine how much time, effort, staff, and money should be devoted to preventing or mitigating each. Again, this must be accomplished not in a vacuum but with full input from team members and subject matter experts (SMEs).

How probable is it that each risk will become a reality? This question needs to be asked and answered. It is often sufficient to use a High-Medium-Low (HML) scale and apply it to the list of brainstormed risks. If a risk is considered highly probable, it receives an H; if the probability is medium, it receives an M; and if the probability is low, it receives an L. These labels should not be applied arbitrarily, emphasizing the need for team collaboration or research and analysis by the project manager.

If the risk becomes a reality, how badly will it damage the project? This is the next question that needs to be asked and answered. All aspects of the project should be considered when rating the negative impact of any risk. If the risk becomes reality, how will it affect the budget, schedule, resource utilization, scope of work, and so on? The output of steps 2 and 3 results in a list of potential risks with corresponding values for probability and negative impact:

**Risk Probability Impact**

A M L

B M M

C L L

D H H

Given the assessment of risks A through D in the table, it is clear that you should focus most of your efforts mitigating risk D and that very little attention should be paid to risk C. Please remember that you could be wrong (unfortunately, I needed to be reminded of this as a young project manager). Just because you label a risk Low probability and Low impact does not guarantee that it will be, so leave it on your radar screen.

For those who prefer metrics, a simple number-based scale can be applied. As you rate probability and impact, you assign a value to each risk. The probability scale can be based on a range of 1 through 10, with 1 representing unlikely and 10 being very likely. Negative impact can be represented by the same scale or in budgetary impact:

**Risk Probability $ Impact Total**

A 3 x 1K = 3K

B 7 x 1K = 7K

C 2 x 14K = 28K

D 5 x 3K = 15K

According to this analysis, risk C will demand most of this project team’s attention because of its relative value of 28K. It should be noted that the same method can be used to focus on schedule impact or even resource utilization.

**Step 4: Prevent or Mitigate the Risk**

Some risks can be prevented; others can only be mitigated. Earthquakes or the retirement of an important stakeholder, for instance, cannot be prevented. Some risks can and should be prevented in step 4. If a risk has been identified and you have the ability to prevent its occurrence, do so. Proactivity is the project manager’s best friend. Kill the risk before it has a chance to grow and flourish, and you won’t have to deal with it again.

For example, if a vendor or supplier is targeted for your project and one of your team members has had previous dealings with the company and was not impressed, he will inform you that the supplier’s material deliveries are frequently late and often rejected. Assuming that the supplier is not a sole source (your only choice), you can prevent the risk by finding an alternate supplier that is more reliable.

For those risks that cannot be prevented, an attempt should be made to mitigate or lessen the probability and/or impact should they occur. Using the example of the unreliable supplier, if you must use that company, you can create concrete steps to pro-actively expedite the delivery of the material, thereby mitigating the impact of the risk. If management threatens to deprioritize your project, you can lobby on your project’s behalf, mitigating the chances that this will occur.

**Step 5: Consider Contingencies**

Preventive measures are those steps taken before the risk becomes reality. Contingencies represent the specific actions that will be taken if the risk occurs. Here, you answer the question “If the risk becomes reality, what will we do”?

For example, if acceptance testing for a supplier’s widgets has been identified as medium to high risk and a test failure occurs, an appropriate contingency might be to supply engineering support at the vendor’s expense. Another contingency might be to switch to another predetermined vendor if he has widgets in stock.

Contingencies are directly linked to the prioritization factors introduced in steps 2 and 3. If the risk is a high priority (high probability, high negative impact) you will want to identify multiple contingencies. Since there is a good chance that the risk will occur and that when it does, it will hurt the project, you want to be covered. If the risk falls in the middle range of the prioritization scale, you should establish at least one contingency. Those risks that fall in the lower level should not require much attention; it is best to invest your efforts elsewhere. When establishing your contingencies, be careful of the very low probability, very high impact risk. These tend to be totally ignored because of the low probability, but they can and sometimes do bring projects down.

**Step 6: Establish the Trigger Point**

The trigger point is often the most important element of the project risk plan. There is a direct relationship between the trigger point and the contingencies. True to its name, the trigger point is the point at which the risk becomes enough of a reality that the project manager needs to trigger the contingency. It is a judgment call meant to maximize the value of the predetermined contingency by implementing it at the optimal time. Trigger too soon and you will probably spend time, effort, or money for no good reason. Trigger too late and you may end up experiencing the full impact of the occurrence, with little value added by implementing the contingency. Let’s return to our example.

If a usually reliable supplier has experienced labor issues and has shut down because of a strike, perhaps your contingency plan has identified suppliers B and C as alternatives. Each has widgets in stock and has quoted a lead time of two calendar weeks for prep and delivery. If the required delivery date is February 15, your trigger should include the two-week lead time plus a few days’ buffer. An appropriate trigger point here would be January 31. If the contingency affects a task or tasks on the critical path, additional buffer days should be considered.

The trigger should be a specific point in time or a defined range of time. Most project managers consider this to be the trickiest part of the project risk plan, but it is well worth the effort.

Often, in my role as consultant, I come across well-thought-out plans that were wasted due to untimely or nonexistent contingency implementation. The trigger point is a best practice for project managers that will improve the efficacy of the entire plan.

**6. What can be a source of conflicts in a team and how can the same be solved**

Conflict is a common occurrence on teams. Conflict itself can be defined as antagonistic interactions in which one party tries to block the actions or decisions of another party. Bringing conflicts out into the open where they can be resolved is an important part of the team leader’s or manager’s job.

As organizations continue to restructure work teams, the need for training in conflict resolution will grow. Conflict arises from differences, and when individuals come together in teams, their differences in terms of power, values, and attitudes contribute to the creation of conflict. To avoid the negative consequences that can result from disagreements, most methods of resolving conflict stress the importance of dealing with disputes quickly and openly. Conflict is not necessarily destructive, however. When managed properly, conflict can result in benefits for a team.

A major advantage a team has over an individual is its diversity of resources, knowledge, and ideas. However, diversity also produces conflict. As more and more organizations restructure to work teams the need for training in conflict resolution will continue to grow. Varney (1989) reports that conflict remained the number-one problem for most of the teams operating within a large energy company, even after repeated training sessions on how to resolve conflict and how to minimize the negative impact on team members. One reason for this may be that mangers and other leaders within organizations are not giving the issue of resolving conflict enough attention. Varney’s research showed that although most managers are aware of disagreements and have received training in conflict resolution, they seldom assign a high priority to solving conflict problems. With this in mind, it is critical that team members possess skills to resolve conflict among themselves.

Conflict arises from differences. When individuals come together in work teams their differences in terms of power, values and attitudes, and social factors all contribute to the creation of conflict. It is often difficult to expose the sources of conflict. Conflict can arise from numerous sources within a team setting and generally falls into three categories: communication factors, structural factors and personal factors (Varney, 1989). Barriers to communication are among the most important factors and can be a major source of misunderstanding. Communication barriers include poor listening skills; insufficient sharing of information; differences in interpretation and perception; and nonverbal cues being ignored or missed. Structural disagreements include the size of the organization, turnover rate, levels of participation, reward systems, and levels of interdependence among employees. Personal factors include things such as an individual’s self-esteem, their personal goals, values and needs. In order for conflict to be dealt with successfully, managers and team members must understand its unpredictability and its impact on individuals and the team as a whole.

Conflict in work teams is not necessarily destructive, however. Conflict can lead to new ideas and approaches to organizational processes, and increased interest in dealing with problems. Conflict, in this sense, can be considered positive, as it facilitates the surfacing of important issues and provides opportunities for people to develop their communication and interpersonal skills. Conflict becomes negative when it is left to escalate to the point where people begin to feel defeated and a combative climate of distrust and suspicion develops (Bowditch & Buono, 1997). Nelson (1995) cautions that negative conflict can destroy a team quickly, and often arises from poor planning. He offers this list of high potential areas from which negative conflict issues commonly arise:

**Administrative Procedures:** If the team lacks good groundwork for what it’s doing, its members will not be able to coordinate their work.

**People Resources:** If the team does not have enough resources to do the job, it is inevitable that some will carry too heavy a load. Resentment, often unexpressed, may build, so it is crucial that team leaders ensure adequate resources.

**Cost overruns:** Often inevitable, cost overruns become a problem when proper measures are not taken. The whole team should know early on when cost becomes a problem so additional funding can be sought by the team. This way the problem can be resolved before it grows into a problem for management.

**Schedules:** The schedule is highly consequential to the team’s project and should be highly visible. All members should be willing to work together to help each other meet their deadlines.

**Responsibilities:** Each team member must know what areas are assigned and who is accountable for them.

**Wish Lists:** Stick to the project at hand and avoid being sidetracked into trying to fit other things into it. Wait and do the other things you would like to do after successful completion of the original project.

Team members can and should attempt to avoid negative conflict from occurring. Being aware of the potential for negative conflict to occur, and taking the necessary steps to ensure good planning will help.

As a leader it is important to differentiate between the different types of conflict teams experience and to have a plan for helping the team move forward.  Here are four examples of team conflict and some advice on how a leader can intervene properly from Dr. Eunice Parisi-Carew, teams’ expert, and coauthor of the upcoming book, “[*Collaboration Begins With You*](http://www.amazon.com/Collaboration-Begins-You-Silo-Buster/dp/1626566178/)”.

**Conflict over positions, strategies or opinions**

If two or three strong, but differing, positions are being argued in the group and it is getting nowhere, a leader might stop the group and ask each member to take a turn talking with no interruption or debate.  The rest are just to listen and try to understand where they are coming from and why they are posing the solution that they are.  It may go something like this.

In this instance, the leader’s job is to make sure everyone is heard. When the exercise is completed the leader should look for concerns or goals that people have in common. Once all are uncovered, the leader can build on any interests that are shared.  In most cases this becomes the new focus and it turns the situation from conflict to problem solving.

**Mistrust or uneven communication**

If some people on the team are dominating the conversation while others sit silent or appear to have dropped out, a leader might stop the process and ask each person what they need from others to feel effective in the group and how others can help.

Another simple practice is to appoint a process observer whose job is to focus on how the team is interacting.  If the teams gets out of kilter it might be tempers are rising or communication is not flowing the process observer is allowed to call time and point out their observations.  For example, “In the last five minutes we have interrupted the speaker 10 times,” or, “We keep talking over each other.”  Just knowing this fact can alter the team’s interaction.  Soon the team will catch itself.  It is harder to misbehave once you know what the impact of your behavior is.

**Personality clashes**

If personal styles are very different and causing conflict among team members, a team leader might administer another behavioral assessment tool to help people better understand each other and learn to work together.  These tools help people understand what the other person needs.  They can also provide a common frame of reference for dealing with individual differences.

**Power issues and personal agendas**

Conflict that involves power issues or strong personal agendas must sometimes be dealt with also.  The reality is that some people just do not fit on a team and a leader needs to be willing to remove them or offer them another role. This doesn’t happen often, but occasionally it is needed.  The good news is that once it is dealt with, the team usually takes a leap forward.  This should be an option only when other attempts to work with the person have failed.

**Handling negative conflict**

When negative conflict does occur there are five accepted methods for handling it: Direct Approach, Bargaining, Enforcement, Retreat, and De-emphasis (Nelson, 1995). Each can be used effectively in different circumstances.

**1. Direct Approach:** This may be the best approach of all. It concentrates on the leader confronting the issue head-on. Though conflict is uncomfortable to deal with, it is best to look at issues objectively and to face them as they are. If criticism is used, it must be constructive to the recipients. This approach counts on the techniques of problem-solving and normally leaves everyone with a sense of resolution, because issues are brought to the surface and dealt with.

**2. Bargaining:** This is an excellent technique when both parties have ideas on a solution yet cannot find common ground. Often a third party, such as a team leader, is needed to help find the compromise. Compromise involves give and take on both sides, however, and usually ends up with both walking away equally dissatisfied.

**3. Enforcement of Team Rules**: Avoid using this method if possible; it can bring about hard feelings toward the leader and the team. This technique is only used when it is obvious that a member does not want to be a team player and refuses to work with the rest. If enforcement has to be used on an individual, it may be best for that person to find another team.

**4. Retreat:** Only use this method when the problem isn’t real to begin with. By simply avoiding it or working around it, a leader can often delay long enough for the individual to cool off. When used in the right environment by an experienced leader this technique can help to prevent minor incidents that are the result of someone having a bad day from becoming real problems that should never have occurred.

**5. De-emphasis:** This is a form of bargaining where the emphasis is on the areas of agreement. When parties realize that there are areas where they are in agreement, they can often begin to move in a new direction.

Rayeski and Bryant (1994) recommend using the Team Resolution Process to handle conflict when it occurs in teams. Conflict should first be handled on an informal basis between the individuals involved. This, they say, will allow time for resolution or self-correction by the individuals. If the conflict remains unsettled, a mediator can be brought in to help resolve the situation. If resolution is still not achieved the dispute should be openly discussed in a team meeting. A formal discipline process needs to occur, if resolution is not achieved after being addressed at the team level. The escalating process of Team Resolution is as follows:

1. Collaboration (One-on-one): Handle the new problem person-to-person. Use as many facts as possible and relate the issue to customer, team, or organizational needs. Be open and honest and conduct the session in a private setting. Document the concerns or issues, the dates, and the resolution, if any, and have both parties sign it.

2. Mediation (One-on-one with Mediator): If collaboration did not work or was inappropriate, handle the problem with a mediator. The mediator must be trained in conflict resolution, understand policy and ethics, be trusted by the team, and have the ability to remain neutral. Gather facts and talk over the issue with the people involved. Bring up as many facts as possible and relate the issue to customer, team, or organizational needs. Be open and honest and conduct the mediation session in private. Document it and have all parties sign.

3. Team Counseling: The conflict is now a definite issue to the team. Collaboration and/or Mediation could not be done, were not appropriate, or did not work. Handle the conflict at a team meeting; put the problem on the next agenda and invite the necessary individuals. Again, bring up the facts; relate the issue to customer, team, or organizational needs. Be open and honest, discuss it in a private setting, document it, and have all parties sign it. Anyone on the team can put an issue or problem on the team agenda, however, this step should be used only after Collaboration, and Mediation has been ruled out.

Because every team is different, disputes that arise will be too. However, Stulberg (1987) recognizes patterns common to all controversies. He calls them the Five-P’s of Conflict Management:

1. Perceptions: People associate conflict with negative responses such as anger, fear, tension, and anxiety. Rarely do we perceive any benefits from being involved in a dispute. Our negative perceptions impact our approach in resolving conflict as we strive to eliminate the source of these negative feelings.

2. Problems: Anyone can be involved in a conflict, and the amount of time, money, and equipment needed for resolution will vary according to its complexity.

3. Processes: There are different ways to go about resolving disputes: Suppress the conflict, give in, fight, litigate, mediate, etc.

4. Principles: We determine the priorities of all resolution processes on the basis of an analysis of our fundamental values regarding efficiency, participation, fairness, compliance, etc.

5. Practices: Power, self-interest, and unique situations are all factors relating to why people resolve disputes the way they do. Stulberg proposed these patterns as an aid for formal mediators, but anyone dealing with conflict can benefit from understanding the elements common to disagreements.

Though the recognition that conflict can be productive is not new (for example, Coser, 1956; Deutsh, 1969), some of the conflict issues that organizations are dealing with are. For instance, one study (Kezsbom, 1992) looked at sources of conflict among project teams and found that the number one issue developed from goals and priority issues. Previous literature (Posner, 1986; Thamhain & Wilemon, 1975) presented the number one source of conflict as being disagreements over schedules, which ranked at number seven in Kezsbom’s study. It makes sense that goals and priority issues have risen on the list as organizations have evolved into multi-project, streamlined environments. In this new complex, hybrid organizations, employees often find themselves serving on a variety of project teams, being led by a variety of project managers while reporting directly to functional managers. This sets the stage for Kezsbom’s third conflict category: communication and information flow. When reporting relationships are complex it becomes more difficult to share information.

Personality and interpersonal issues, ranked in the number two category by those in high technology environments, presented another dramatic change from previous studies. This change may be related to the increased use of cross-functional, self-directed teams in which individuals with technical backgrounds must rely on the work of others to get their own work done. This specifically illustrates how important it is to provide training in communication and interpersonal skills to cross-functional team members, while emphasizing an appreciation of the value of differences.

Overall, this study provides valuable insights for organizations, project leaders, and project team members. Because goal and priority issues frequently change, communication must be improved. Kezsbom (1992) makes these recommendations:

More frequent and effective upward, downward, and team communications. More frequent meetings and status review sessions to increase communication between functions and minimize inconsistent perceptions of project goals and priorities. Increase human relations training and facilitate more active team-building efforts.

Organizations must be aware that conflict grows from differences, but so does innovation. If project teams are properly trained in human relations and team-building skills, production and quality measures will increase. No matter what kind of team it is, no method of managing conflict will work without mutual respect and a willingness to disagree and resolve disagreements. Donald Weiss, president of Self-Management Communication, Inc., believes each person on the team must be willing to take the following four steps when a team meeting erupts into a storm (Weiss, 1997): listen, acknowledge, respond, and resolve remaining differences.

Listen: To hear what someone else is saying is not the same as listening. To listen effectively means clearing your mind of distractions and concentrating not only on the words but also on nonverbal gestures, which often convey ninety percent of what the person is trying to say. When resolving disagreements, you often have to deal with feelings first.

Acknowledge: You can acknowledge people’s positions without agreeing with them. Show this with statements like, “I understand that you’re angry,” “If I understand you, you think we should”, or “Let’s explore your opinion further.” You may still disagree with them, but at least they know you’ve heard them.

Respond: You’ve listened and acknowledged what the other person is saying. Now it is your turn to be heard. If you’re offering criticism of your teammate’s ideas, make sure it’s constructive, and if you’re disagreeing with them, be ready to offer an alternative. Be willing, also, to be questioned or challenged, while avoiding defensiveness when you answer.

Resolve remaining differences: Define the real problem by looking for what’s causing the disagreement. Then analyze it into its manageable parts. Now you can generate alternative solutions to the problem and select the alternative on which everyone can agree.

For individuals to work effectively in teams they must be able to clearly communicate their ideas, to listen, and be willing to disagree. Although it is difficult, learning to appreciate each other’s differences reflects a team’s ability to manage conflict. When conflict occurs we must not turn our backs and hope it will go away. Instead, we must learn to tolerate it, even welcome it, for well-managed conflict can be the source of change and innovation. As more and more organizations attempt to make the difficult transition to teams, they must develop and provide programs for their employees by offering training in conflict management skills and techniques. These ideas can help organizations and their teams begin, or continue, this challenging task.

Gain common ground by putting the conflict in perspective with the goals and purpose of the team.  
Seek to understand all angles of the disagreement, keeping in mind that understanding is different from agreement. Attack the issue, not each other. Channel anger and hostility into problem solving and action planning. Develop an action plan describing what each person will do to solve the problem.  
This method allows both parties to acknowledge the nature of the conflict, and then jointly work toward resolving it. As with Varney’s (1989) approach, the key to this process is responding quickly and effectively when conflict presents itself. Teams are cautioned to avoid covering up painful issues. Sooner or later, unresolved issues tend to resurface, often in uglier forms than before. Along the same lines, teams should not automatically defer an issue to management, as this disempowers the team. Instead, they should learn how to handle disputes themselves, requesting help from management only when their own attempts at resolution have failed. Fisher et al. (1995) stress that team members should be encouraged to voice their concerns in team meetings rather than outside the team setting, in an attempt to avoid what they call the AParking Lot Commentary (p. 212). This happens when team members are afraid to voice feelings to the team so they begin to talk about team issues in conversations with individuals. When this occurs it undermines the trust and integrity of the team.

**7. Give some ideas citing relevant examples for successful and better project teams**

Team effectiveness, also referred to as team performance, is a team's capacity to achieve its goals and objectives. This capacity to achieve goals and objectives leads to improved outcomes for the team members (for example, team member satisfaction and willingness to remain together) as well as outcomes produced or influenced by the team. In a science team or larger group, the outcomes include new research findings or methods and may also include translational applications of the research.

More than half a century of research on team effectiveness ([Kozlowski and Ilgen, 2006)](https://www.ncbi.nlm.nih.gov/books/NBK310384/) provides a foundation for identifying team process factors that contribute to team effectiveness, as well as actions and interventions that can be used to shape the quality of those processes. This evidence base consists primarily of studies focusing on teams in contexts outside of science, such as the military, business, and health care. These teams share many of the seven features that can create challenges for team science introduced. For example, in corporations, top management teams and project teams are often composed of members from diverse corporate functions, and these teams seek to deeply integrate their diverse expertise in order to achieve business goals. Therefore, the committee believes the evidence on teams in other contexts can be translated and applied to improve the effectiveness of science teams and larger groups.

The conceptualization of project success as a multi-variable construct is described in Gladstein (1984), Hackman (1987), Sundstrom et al. (1990), Pinto et al. (1993) and Denison et al. (1996). This literature distinguishes between task-related outcomes (example, quality of the software product and adherence to cost and budget) and people-related outcomes (example, team member satisfaction and viability of the team). In this study, we use the outcome categories of team performance and team members’ success

Team performance may be defined as the “extent to which a team is able to meet established quality, cost, and time objectives” (Hoegl and Gemuenden, 2001). Many team performance models and teamwork frameworks describe team work quality and its relation to team performance in general, example, Mathieu et al. (2008), Cohen and Bai- ley (1997) and Rasmussen and Jeppesen (2006). Team performance and team effectiveness are often used synonymously in the literature; sometimes team performance is part of team effectiveness, example, Cohen and Bailey (1997), and sometimes team effectiveness is part of team performance, example, Hoegl and Gemuenden (2001). Most of the models of team performance (or team effectiveness) originate from management science and psychology (Salas et al., 2007). In this study, team performance is described in terms of the sub constructs effectiveness and efficiency. Effectiveness refers to the degree to which the team meets expectations regarding the product quality. The quality of a soft- ware product is often measured by the customer, and includes aspects such as functionality, robustness, reliability, and performance. Efficiency refers to the degree to which the team meets expectations regarding project quality.

(Hackman, 1987; Sundstrom et al., 1990). It is obvious that the success of team members increases their motivation for working on future projects of the same team. Collaborating with other team members also provides the opportunity for learning social, management, technical, and creative skills. In some team performance models, example, Janz (1999), learning is defined as one of the aspects of team work quality, and thus is seen as a contribution to the success of a project its outcome and not as a part of the outcome itself.

One key consideration regarding team effectiveness is that it is inherently multilevel, composed of individual team and higher-level influences that unfold over time ([Kozlowski and Klein, 2000](https://www.ncbi.nlm.nih.gov/books/NBK310384/)). This means that, at a minimum, three levels of the system need to be conceptually embraced to understand team effectiveness (for example, within person over time, individuals within team, and between team or contextual effects; [Kozlowski, 2012)](https://www.ncbi.nlm.nih.gov/books/NBK310384/). Broader systems that encompass the organization, multiple teams, or networks are obviously even more complex. Moreover, individual scientists may be part of multiple research projects spread across many unique teams and thus are “partially included” in their teams ([Allport, 1932)](https://www.ncbi.nlm.nih.gov/books/NBK310384/).

A second critical consideration for understanding, managing, and improving team effectiveness is the degree of complexity of the workflow structure of the team task ([Steiner, 1972)](https://www.ncbi.nlm.nih.gov/books/NBK310384/). In simple structures, team members' individual contributions are pooled together or constructed in a fixed serial sequence. For example, in a multidisciplinary team, members trained in different disciplines combine their expertise in an additive way. Complex structures incorporate the integration of knowledge and tasks through collaboration and feedback links, making the quality of team member interaction more important to team effectiveness.

A final key consideration is the dynamic interactions and evolution of the team over time. According to [Kozlowski and Klein (2000](https://www.ncbi.nlm.nih.gov/books/NBK310384/), p. 55):

A phenomenon is emergent when it originates in the cognition, affect, behaviors, or other characteristics of individuals, is amplified by their interactions, and manifests as a higher-level, collective phenomenon.

In other words, emergent phenomena arise from interactions and exchange among individuals over time to yield team-level characteristics. Emergent phenomena unfold over time as part of the team development process. Time is also pertinent with respect to how teams themselves evolve. For example, [Cash et al. (2003)](https://www.ncbi.nlm.nih.gov/books/NBK310384/) reported on the evolution of a trans-disciplinary group focused on developing improved varieties of wheat and corn. The authors reported that a strictly sequential approach in which scientists first developed new crops in the laboratory or field and then later handed them over to native farmers did not lead to widespread use of the new crops. However, when the native farmers were brought into the research at an earlier point in time, as valued participants and partners with the scientists, the group produced new crops that were widely used. Relatedly, teams have different time frames for interaction (i.e., their life cycle or longevity), and this too will alter the emergent dynamics (example, [Kozlowski et al., 1999](https://www.ncbi.nlm.nih.gov/books/NBK310384/); [Kozlowski and Klein, 2000](https://www.ncbi.nlm.nih.gov/books/NBK310384/); [Marks, Mathieu, and Zaccaro, 2001](https://www.ncbi.nlm.nih.gov/books/NBK310384/)).

**Here below are some of the examples of a successful project team:**

**Team work**

Teamwork is obviously important in project development and implementation. In traditional development, the study by Faraj and Sproull (2000) showed a strong relationship between management of expertise and team performance. Another study demonstrated the importance of cooperative learning on project success for software development teams (Janz, 1999). In agile development, a few studies analyzed teamwork using team performance models, such as the one found in Moe et al. (2010). Sharp and Robinson (2010) described how agile development teams enable collaboration, co-ordination, and communication. Another study Pikkarainen et al. (2008), focused on how agile development methods improve communication, and claimed that Scrum and XP practices improve both formal and informal communication. Maruping et al. (2009) demonstrated that XP practices of collective code owner- ship and coding standards could lead to increased technical quality of software products. A survey of success factors of agile development found that team capability was one of the factors (Chow and Cao, 2008). Detailed models that show relationships between various as- pects of teamwork quality and team performance have been used in studies of software teams; for example, those described in Hoegl and Gemuenden (2001), Salas et al. (2005), Dickinson and McIn- tyre (1997) and Janz (1999). In this work, we focus on the factors described by Hoegl and Gemuenden (2001).

**Team work quality**

The successful project team can be seen through team work quality. We use the construct of teamwork quality conceived by Hoegl and Gemuenden (2001), which refers only to the quality of interactions. Measures of the task process, the task strategy, and the quality of the performance of the task activities performed by the individual team members are not the subject of this team work quality construct, nor are management activities such as task planning, allocation of resources, or management by objectives. Team work quality is conceptualized as a higher order construct and is based on Hackman’s input-process-output model on group behaviour and effectiveness (Hackman, 1987) and derived from McGrath (1964). The six sub-constructs of communication, coordination, balance of member contribution, mutual support, effort, and cohesion cover performance-relevant measures of internal interaction in teams.

**Communication**

The importance of open and clear communication cannot be stressed enough. This is probably the most important characteristic for high-performance teams. Many different problems that arise on projects can often be can be traced back to poor communication or lack of communication skills, such as listening well or providing constructive feedback.

Excellent communication is the key to keeping a team informed, focused, and moving forward. Team members must feel free to express their thoughts and opinions at any time. Yet, even as they are expressing themselves, they must make certain they are doing so in a clear and concise manner.

Pinto and Pinto (1990) describe quality of communication within a team in terms of frequency and formalization of the information exchange. Frequency refers to how often communication occurs among team members and how much time is spent on it. Formalization refers to the degree of spontaneity in the communication. Communication that requires much planning and includes written status reports, and so on, is considered formal, while spontaneous communication, such as talking in the doorway, chatting, talking in front of the screen, and so on, is considered informal. Ideas and contributions are usually shared, discussed, and evaluated with other team members more quickly and efficiently in informal communication than in formal communication. It is also critical for the quality of communication that team members share their information openly with each other (Gladstein, 1984). Lack of open communication may hinder sharing of knowledge and experience that may be relevant for common tasks. In agile teams, the team members are often placed close together in open-plan offices to stimulate informal and open communication.

**Coordination**

Malone and Crowston (1994) describe coordination as “managing dependencies between activities.” Such dependencies include shared resources, task assignments, and task/subtask relationships. Many activities in task processes are delegated to individual members. Harmonization and synchronization of these individual activities are important for the team work quality and project success (Tannenbaum et al., 1992; Brannick et al. 1995). Teams need to agree on common structures for breaking down work, schedules, and effort needed for the tasks. Coordination means that the teams must develop and agree upon a common task-related goal structure that has sufficiently clear subgoals for each team member. In agile teams, tasks are often selected or delegated when planning a new iteration. In a given iteration, some of the “user stories” (requirements) in the backlog are prioritized. A user story is often divided into several tasks. The workload for the tasks is estimated and each task is de- signed for or selected by one or more of the team members.

**Balance of member contribution**

The contribution of the task-relevant knowledge and experience of all members to the decision-making processes of the team may benefit the team (Hackman, 1987; Seers et al., 1995). Balanced contribution is critical in software teams with members who have expertise in different areas (core development, GUI development, system architecture, testing, etc.). If only one or even just a few team members dominate the discussions, the others may become less motivated for the work, which in turn may hamper overall team performance. The daily meetings (Stray et al., 2016) in agile teams support such a balance of member contribution.

**Mutual support**

In software teams (as well as other teams working with innovative projects), the many inter-dependent tasks and the tight collaboration among individual team members together make cooperation a central issue. A competitive attitude meaning self-interest at the expense of overall performance of the team tasks may not benefit the work of the team (Tjosvold, 1998). The team members should be given assistance when needed and should take the other team members’ contributions into consideration rather than trying to outdo the other team members. Some agile development methods include collective code ownership, which in turn stimulates mutual support and collaboration.

**Effort**

Team members should do their best to support the tasks of the team. Hackman (1987) describes conditions that support effort, and says it is important that “interaction among members minimizes social loafing and instead promotes a shared commitment among members to the team and its work.” Prioritization of a team’s tasks over other tasks is a good indicator of the effort that team members spend on common tasks (Hackman, 1987; Pinto and Pinto, 1990). In a focus group study of what hinders and what fosters effective teamwork in projects’ teams, prioritizing the team’s tasks was perceived as one of the most important factors for achieving better team performance (Dingsøyr and Lindsjørn, 2013).

**Cohesion**

A common definition of team cohesionis “a dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its goals and objectives” (Mudrack, 1989). Mullen and Copper (1994) distinguish between three aspects of team cohesion: (1) commitment to the team tasks, (2) interpersonal attraction of team members, and (3) group pride/team spirit. In a survey of 31 software teams, team cohesion was found to be the dominating factor when investigating the influence of team cohesion, team experience, and team capability on team performance (Lakhpanel, 1993). In agile teams, the members are often placed close together in office. According to the agile model of development, individuals and their interactions are valued over processes and tools, thus revealing the value of team cohesion.

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