Managing Client Projects

By Jim Marlatt

Last Revised 9/1/2010

Table of Contents

1. Project Management Case Study

The case study revolves around a private gym called Bodies of Steel. This gym has more than 2,000 members, with more than 60% of them being busy single, professionals who typically use the gym before and after work. The gym provides a variety of products and services, including racquetball, basketball, swimming, pilates, weights, personal trainers and a full-service restaurant and bar. Currently the gym is experiencing several major challenges, including: Members are complaining that it is difficult to make reservations because the front desk personnel are overworked and do not answer the phone quickly; and/or without seeing what is available the members have to ask the clerk many questions before finding a time that is suitable to them and available. In addition, in this very competitive environment, the gym would also like to reduce the cost of their clerical personnel, in particular front-desk staff. Even though the gym is facing these two difficult challenges, it continues to be successful because of the fun atmosphere where members can socialize with one another while getting in a workout or grabbing a meal and a drink. The gym wants to make sure that this fun environment is not negatively affected by any changes to address the above opportunities.

2. Project Management Overview

Introduction:

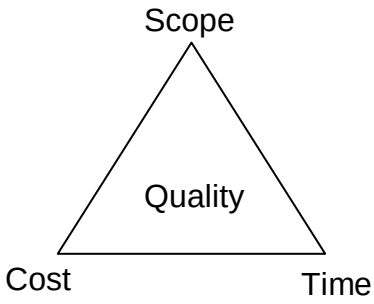
A project is an organized activity with a well-defined purpose, completed by a dedicated project team within a given timeframe. In other words, a project has a beginning and an end; the end comes when you have achieved the project's purpose. Once you have achieved this purpose, the project is over. The project team may stay together and work on extending the project's purpose, but this is considered another project – for example the first project designs and implements a new self-service facility registration system for a recreation center (the project's purpose) – improvements to this system after it has been released or the addition of a new function (such as the member changing how they pay their dues each month) which was not included in the first project are different projects, with a different purpose and different timeframes than the original project. In order to initiate a project with an appropriate purpose, it is first necessary to determine the root cause of the business problem or need which the project will then go about solving. To define this purpose, an individual or group must go through the process of framing and identifying the business problem and defining a solution to that problem. Then it is necessary

to design an analysis that will gather data to verify that the defined business problem is indeed the root cause of the company's underperformance, and that the identified solution actually solves the problem or problems identified. Note: Either or both of the problem and solution may be found to be incorrect during the analysis process, in which case either the team should go back to the previous step and be reexamine the problem. This requires proposing a new problem or solution and then again designing another analysis and verifying whether these newly defined problem and analysis are indeed correct. Once the defined problem and identified solution have been proven to be correct, the purpose of the project has been identified and initiation of the project may begin.

Triple Constraint:

As a project manager you will hear this term a lot. It can be confusing because there are four constraints, not three. The triple constraint (also referred to as Dempster's triangle) describes the balance between a project's scope, cost, schedule (time) and quality. Quality was added later, thus the name triple constraint. As a project manager, you are often told that a project must be completed by a certain date or for a certain amount of

money (cost) or both. At the same time your project deliverables typically must meet some minimum specifications (quality) to be useful to the organization. For example when a member makes a reservation, it should not take longer than 30 seconds from start to finish, otherwise they will simply call the front desk as they have in the past. The area you typically have some leeway to maneuver is project scope. (See project scope for a definition)



During project planning you work with management and your project team to define the project scope, schedule, cost and quality; as the project progresses it is not uncommon to discover that your plan needs some adjustments or the stakeholders make change requests or both. If there is a change request that increases the project's scope, then at least one or more of the other constraints must also change. For example if management asks us to increase peak center utilization (this was out-of-scope in our original

charter), we will either have to reduce the quality of our work in other areas to accommodate this, spend some additional money to bring in more resources (e.g. outside consultant) or spend more time to complete the project (this will also probably cost us more money). So a change in one of the constraints will force us to change at least one or more of the other constraints. One of our most important responsibilities as project manager is to be aware of any changes to our project plan, and before accepting these changes, review them to determine what impact they will have on our triple constraint.

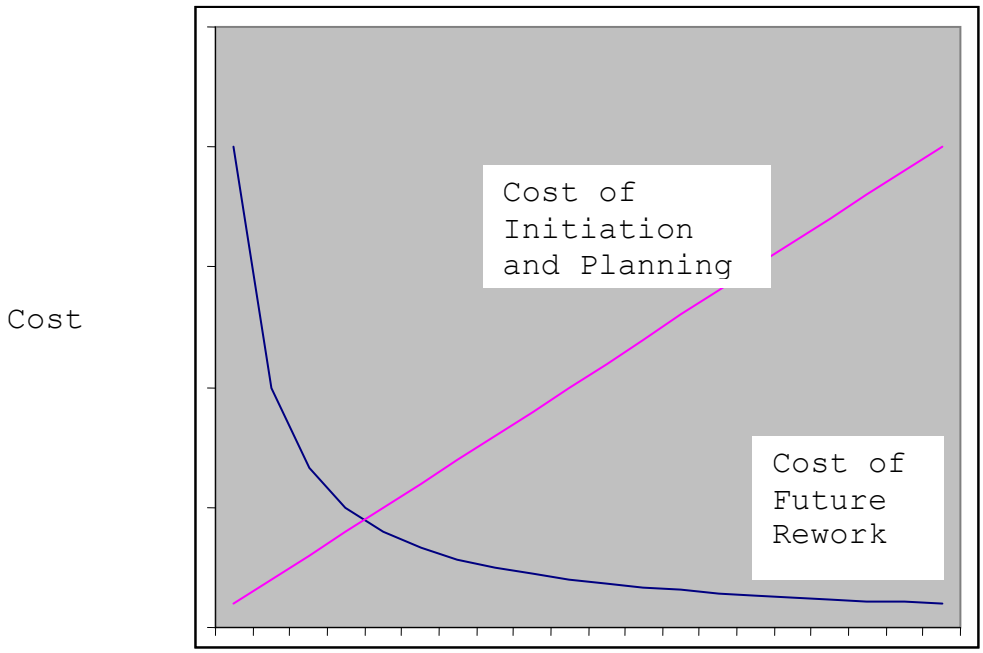
A Project is Accomplished Through a Series of Processes:

According to the Project Management Institute (www.PMI.org) a project is made up of five processes: *project initiation, project planning, project execution, project controlling* and *project closing*. PMI has conducted a study showing that investing in project initiation and planning at the beginning of a project, before you incur most of the project cost, is the **most effective** way of ensuring that the project will meet its objectives. As the figure shows, a relatively modest investment at the start of a project will reduce by a much larger amount the cost of rework at later stages. Also note that the return on investment from

planning is not infinite. As the cost of planning continues to increase at a steady rate, the cost of rework doesn't continue to decrease at the same rate.

--

[Impact of Investing in Project Initiation and Planning]



-- Source Arthur Andersen --

A project plan is not a big investment of time or resources; it usually takes less than a couple of weeks to develop for most projects. IT project managers often say that one day of planning saves 2-4 days of work during the

project. Who would turn down an investment opportunity with 100% to 300% return?

Project Initiation:

Projects can be initiated by anyone in an organization. Regardless of whom initiates a project, it is good practice to identify a project sponsor with enough authority and organization knowledge to do the following: make sure the planned outcome of the project will help the organization achieve its strategic objectives; assist in getting the right resources for the project (money, people, equipment); help get resolution to project issues in a timely manner (resource conflicts, disagreement on project objectives, changes to project scope, etc.); provide the project manager with the authority he or she needs to successfully complete the project.

Organizations do not have unlimited resources and invest in projects if they believe its outcome will add value to the organization. Typically, value comes about when you solve a problem or exploit an opportunity, whether it is for competitive, economic or regulatory reasons. Projects are initiated as the direct result of opportunities or problems within an organization. This is the project purpose.

Organizations define what business value means to them and how to measure it. Business value can be categorized into several broad areas including, revenue/profit growth, cost reduction and capital utilization. Examples might be improved customer retention, higher market share, lower cost of goods sold, etc. In our project, the value is an increase in gym membership as a result of better facility utilization and the reduction in clerical cost as members self-register for facilities.

During the initiation process, the project manager works with management to develop the project charter, which includes: define the project purpose; how project success will be measured; project in and out of scope; project manager authority; and project deliverables. This process usually is a small percentage of the overall project time and cost and at the conclusion of this step, if it doesn't appear a project will achieve the value expected, the project should be cancelled. Otherwise the charter is used as input into the more detailed project planning process.

Project Planning Process:

The project charter is used as input into the planning process during which the following will be determined: what

work will need to be done to achieve the project's objectives; how much time the project is expected to take; how much the project is expected to cost; what human resources will be needed to complete the project within the planned schedule and budget; how will the project team communicate internally and with people and organizations that are going to be using the project's output (e.g. gym members); and how will the project team know if the project's output meets the expectations of its users? (stakeholders such as gym members).

Just as with project initiation, if management believes that the project will not achieve its purpose within the time and cost budgeted, the project should be cancelled. At this point in time very little resources have been consumed to create the project plan, certainly much less than will be if the project is continued.

Project Execution:

The ongoing management of a project is also critical to keep the project on track. Project execution includes: acquiring the resources necessary to complete the project as defined in the project plan (people, money, equipment); providing any necessary training for the project team;

reporting project status to all interested parties (stakeholders) throughout the project; and gathering and reviewing any changes that are requested by project stakeholders to determine whether the changes will be made or not (if a change is made, the project plan must be updated including at least one or more of the following cost, time, scope and quality).

Project Controlling:

Just as with project initiation and project planning, the project manager must be diligent in assessing whether the project is going to achieve its purpose or not within cost, time, scope and quality. If not, the project manager must either identify what needs to be changed in order to correct this or should recommend the project be cancelled. During the controlling process the project manager should identify experienced resources that can provide some of this oversight. Their responsibility is to help the project manager monitor the project scope, schedule, cost and quality to assess whether the project is under control. This is a continuous process that occurs throughout the project. As problems are discovered, changes are identified that can be made to the project plan. In the worst-case scenario, it is determined that the project

cannot achieve its purpose within an acceptable time, cost, scope and quality and so it is cancelled.

Project Closing:

Project closing has traditionally not been considered very important. The project team and, indeed, management are eager to go on to new things. However, organizations that take the time to analyze what happened on each project and learn from its successes and mistakes do better on later projects. Project closing also includes some other very important activities: getting the client to accept the project with a formal signature; making or receiving any final payments; releasing the project resources; and organizing and storing the project files so they are accessible to others as needed in the future.

Closing the Project

When a project is done – the application is implemented, users know how to use it, and any missing documentation has been completed – the project team will most probably be disbanded. Part of the team may stay on to maintain the system, but others will go on to new areas. Before this happens, however, it is important to have a formal closing of the project.

This closing serves several purposes. First, this is the time to assess which of the measurable objectives have been accomplished and which require more time before they can be truly assessed. For the latter, you should create a benefits realization plan to follow up on them in a reasonable period of time in the future.

Second, you should make a list of requirements that were proposed but not implemented in the first release, as described in Chapter 9 in more detail.
Third, the entire project team should meet as a group and go over what happened on the project – what was done well and where the problems were. All the lessons learned on the project should be documented for use by future project teams as part of a continuous improvement effort.

Chapters 3, 4 and 5 were written by Paolo Ruiz and based on the book The McKinsey Mind: Understanding and Implementing the Problem-Solving Tools and Management Techniques of the World's Top Strategic Consulting Firm by Ethan Rasiel and Ph.D.,Paul N. Friga, McGraw-Hill, 2001.

3. Framing the Business Problem

Introduction:

In order to design a project, it is necessary to first determine the problem which the project is meant to solve. The first and most crucial step in this process is framing the business problem for your company. In order to frame a business problem, you must first determine the type of business problem or need that your company has. A business problem or need may be competitive, organizational, financial, or operational.

Components:

Competitive

A competitive business problem is a problem where a certain condition of operation makes the company less competitive relative to its peers in the industry. A competitive business problem is often also an organizational, financial or operational problem. Examples of competitive business problems often result in not gaining sufficient share of a growing market or losing market share in a stagnant or shrinking market. Both of these can be due to factors such

as a less competitive cost structure, product offering, service capability or poorer brand recognition relative to the firm's competitors. In the case study it is stated that due to competition, the firm would like to cut costs in the area of their clerical personnel (which means they have a less than competitive cost structure).

Organizational

An organizational business problem may be related to any facet of the firm's organization that is not being completely leveraged or that is negatively impacting the goals of the business. This is caused by the way in which people in the firm are organized to perform their duties. For example, if it is critical that a firm's salespeople be in direct contact with its suppliers, but the organization of the firm does not allow for this, or the communication between these two is inefficient, than this is an organizational problem or need. Often companies have organizational problems due to ineffective communication between managers and employees, or between two groups, as just mentioned in the example.

Financial

A financial business problem pertains to the financial aspects of the firm: either capital structure, the respective levels of debt or equity in the business, or other financial aspects such as income profit margin, or variable and fixed costs. In the Bodies of Steel case, a financial business problem/need can be identified by looking into whether or not there is enough income to cover the costs of purchasing and implementing an online registrations system. It is assumed in the case study that the company is producing enough income to cover the costs of the online registration system and therefore there is not a financial business problem or need for Bodies of Steel.

Operational

In the case study there is a problem with front desk employees being overworked and causing delays in customer service. Additionally, customers have a difficult time knowing all the times and facilities that are available at the gym, and need to rely on front desk personnel, causing a large increase in the time needed to process their requests. These are both examples of operational business problems/needs.

Below is a worksheet to help you organize the identification process of Bodies of Steel's business problems/needs:

Identification of Business Problems/Needs Worksheet **Date:** February 1, 2XXX **Company:** Bodies of Steel
Competitive: -Competitive need to cut clerical costs, develop a more competitive cost structure relative to industry peers
Organizational: -*N/A*
Financial: - *N/A*
Operational: **-**Overworked and ineffective front desk personnel, causing a large increase in time needed to process reservations and scheduling requests

4. Defining the Solution

Introduction:

Once you have identified the problem or need, you can begin to seek a solution. It is important to conduct a fact-based problem solving process in *defining your solution*. It is also important to design an analysis that will enable you clearly define a solution that will actually solve the newly identified problem or problem(s) like the two we see in the Bodies of Steel case study.

Defining the Solution

In the Bodies of Steel case study there is a problem with having ineffective, inefficient front desk personnel and reservation process in the same place that the firm thinks there may be strategic cost cutting needed. Often you are limited in what changes can be made in order to solve these competitive and operational problems. For example, there may be limits to the types of online registration systems Bodies of Steel can use to improve customer service. Some may not solve the problem, and some may solve the current problem but create different new problems, which in total create more of a problem than before. These possible solutions lie *outside the scope* of potential solutions. Another limitation may pertain to the proposed solution of

simply firing and hiring of different, more capable personnel. In fact this may not be possible due to a lack of more qualified workers in the town or city that Bodies of Steel resides in. There will also be limits to solutions of potential cost cutting measures. Firing employees may be outside the project scope for many large firms with employee unions or where management doesn't have a hire/fire mentality. A final limit is the time in which any prescribed solution will take to implement. A reasonable time for the solution to take will be dictated by management, given the constraints of the business. For Bodies of Steel, it is important to determine which course of action is inside and outside of the project scope in order to solve the identified problem. Once all courses of action have been identified, the team can move forward with defining a solution using the identified "in-scope" solutions.

In identifying the problems faced by Bodies of Steel we have also concluded that both of these problems, the ineffective and inefficient front desk staff, as well as the need for reduction of cost in the clerical personnel area, are most likely <u>not</u> mutually exclusive, that is, any solution will affect <u>both problems</u> and the outcome of <u>both</u>

objectives. The problems in other words are directly linked to one another and are not separate. The solution to one problem will affect the solution to the other. Therefore, scope will play an integral part in the final solution. This is not always the case, but it is important to make this distinction before completing the scope portion of your analysis.

All functions in a business are solutions to various needs of the business. When defining scope during the framing phase, it is also important to think about what function is currently being performed in the area of the business under examination, and how that function (or solution to a need) fits within the current scope. Is the function now being performed in line with the scope present in the current operations? More specifically, the core of the problem may lie in the fact that the function being performed fits with the old scope. For example, with Bodies of Steel, when the gym first started, there were fewer members and thus the front desk staff was able to adequately provide a high level of customer service at a low cost. Think of this in the context of a solution (human staff) to the need for the customer service function to schedule reservations was inside the project scope at that time. However, now that

customer volume has increased, this solution is no longer within the scope of a satisfactory solution. This could also be the case with cost. An employee based solution was cost effective when the gym began, but is no longer. It is important to re-examine what the current objectives and scope of the business are, and whether or not the functions in the indentified problem area fit these objectives are within this scope. One should also consider, especially in a fast moving market or industry, what future scope and objectives may be for the company in question.

Defining the Solution in terms of Its Component Elements

Introduction:

The second step in more clearly defining the analysis needed to prove or disprove the identified problem is to view potential solutions in the context of how they solve the problem components identified. If any solution does not sufficiently solve all of the problem components, it is *not* an acceptable solution. In the Bodies of Steel case study the two major components of the company's problem already identified are: the operational problems of an ineffective and inefficient customer service/front desk function; and secondly, a competitive need to reduce the cost of clerical personnel, particularly in the front desk area. When defining the solution that will best solve the major problems in a case, the defined solution should adequately solve all of problems previously identified. We will give 3 examples of possible solutions and how they interact with each problem.

Potential Solutions

Solution 1

One solution would be to hire new personnel that are more efficient than the clerical personnel currently working at the firm. This solution would not only be incomplete, but

in many ways detrimental and most likely not feasible. First, it inadequately addresses the inextricably linked problem of cost reduction; as the new hires would most likely demand to be paid the same wages or more as the previous staff, as they presumably produce higher quality work. In addition, it would most likely exacerbate the cost cutting problem, as the firing of the previous staff would likely result in higher total expense due to payments of built up sick and vacation days, etc to exiting employees as well as the added expense of training the new employees; both costs are ones that would not otherwise be incurred with business as usual. Finally, this solution is very unlikely to be successful when taking into account qualitative components such as the detriment to the morale of other employees of the firm as well as the predictable dip in customer service while the new staff is trained and brought up to speed, which would make one of the major components of the overall problem worse and not better for at least weeks and perhaps months. Finally, this solution is flawed in the fact that it is unlikely that new staff would provide better customer service as the root cause of the front desk problem is the fact that 1) the staff is overworked, and 2) each staff member cannot perform adequate service to the customers because it is impossible

for them to check the availability of all facilities in a comprehensive or timely manner. Neither of these component problems will be solved by changing the clerical personnel. If indeed the nature of the customer service problem component is an organizational one which cannot be solved by changing personnel, as we have identified, than it is necessarily impossible that new personnel would be more effective and efficient.

Solution 2

Another solution would be to re-train existing personnel to be become more effective and efficient. Relying on the hypothesis laid out in solution one, we have already determined that the nature of the problem lies in the lack of efficient communication provided by the current front desk function, which creates an inability of the clerical personnel at the front desk to provide timely or comprehensive customer service. It is impossible therefore, even with re-training, that the personnel could ever achieve a satisfactory level of customer service. More personnel could be hired, which would solve the component of being overworked. However it would not change the ability of the individual members of the clerical staff to know the availability of all the facilities in a timely

manner. The customers knows what times and types of facilities are right for them, so no member of front desk personnel can serve the customer's needs like an online registration system that allows the customer to make their own choice. The rudimentary function that is now in place, takes an enormous amount of time as the front desk staff member goes through a number of needless scenarios with the customer on the phone before finding out which time and facility works best for that customer. In addition, this solution would add to the total cost of clerical personnel, either by adding more employees to the payroll, or by increasing the cost by the amount of expense that is necessary to re-train the current employees.

Solution 3

The last solution, and the one that we have deemed best solves the needs and accomplishes the objectives of the firm going forward is to look into purchasing software that would allow for gym members to search for and make facility reservations online. This accomplishes a solution to the customer service function being overworked, as there is effectively no limit to the capacity of the system being used. It also solves the problem of cost cutting, as the majority of the clerical staff cost can be eliminated and

only an up-front cost of the purchase and installation of the software itself will be incurred. This interface- or the method in which the customer members and the gym interact- is much more efficient and faster than the current interface experience of having members call and speak to a member of the desk staff. It is important to look back at the scope mentioned in the previous section when judging whether this is truly the best solution to all components of problems identified in the first section. A choice between alternatives of software must actually lower the cost in a pre-determined future period; it must also truly solve the problem of effective and efficient handling of members' scheduling time in the various facilities throughout the day. In the end a simple subtraction problem must be derived to find the total net value of solution 3. Relative to business as usual (BAU), benefits of taking the course of action described in solution 3 are: the benefit of implementing the online registration software as opposed to keeping on the clerical staff for within in a pre-determined period (say 3 years). This is derived by identifying the total cost of keeping employees on for an additional 3 years- the benefit is characterized as the value of not having to incur this expense over the period. Also taken into consideration are the qualitative

benefits of the better customer service, which will likely create quantitative benefits for the gym through additional memberships and improved customer retention. This is due to the increase in value to the customer because of the actions taken to implement the online reservation system. Members already come in for the fun atmosphere where they can work and grab a bite and a drink; and with this improvement, the negative effects of frustration in scheduling a reservation are removed, thus providing more value for the customer. Finally, any qualitative benefits not directly related to the improved customer service, such as perception due to the overall change perhaps a re-branding of the gym as more progressive, forward thinking and hip, should be also be accounted for as part of this solution.

These benefits will need to then be netted with the costs of implementing solution 3 relative to a BAU scenario. Costs include the cost of purchasing and installing the new software, including the costs of re-training current and future employees. Any costs associated with firing current employees also need to be taken into account. Qualitative costs such as temporary frustration experienced both by employees and customers as the new system is implemented,

need to be accounted for; as well as qualitative costs unrelated to the change in customer service, such as the potential bad perception by the local community of the company firing staff which may lead to quantitative costs due to loss in potential new memberships and lower customer retention. It is critically important to meet with management to determine the various qualitative costs of a prescribed set of actions as well the magnitude of the cost of each one. We proceed with the assumption that we are able to find a software package and course of action in line with solution 3 that gives us a significant net benefit.

For a visual representation of how each of our proposed solutions solves the various components of the identified problems, see the chart below:

	Solution 1	Solution 2	Solution 3
Solves Competitive Need to Eliminate Clerical Costs			SC
Solves Operational Problem to provide a more efficient reservation system	PS	PS	SC
Does *not* cause other quantitative problems			SC
Does *not* cause other qualitative problems		SC	SC

Key:

SC= Solves Completely

PS= Partially Solves

As we found out, only solution 3 solves all of the components of the identified problems.

5. Proving or Disproving the Identified Problems and Defined Solutions

Introduction:

You've now completed setting up your analysis. It is now time to take the problems you have framed and the solutions you have identified, and go through the process needed to prove or disprove them. If you find that the data you gather disproves the problems identified, which would mean that you've found that there are other possible root causes in the area of underperformance of the company, and then you need to go back and reframe the problem. If the data you gather disproves that the solution is indeed the best fit to solve all of the problems identified in context of their boundaries and components, again you must go back to the analysis phase and make a different hypothesis for your solution. This may seem tedious, but it is much better to spend a day or two ensuring that you have correctly indentified the root causes of your firms' problems and the correct solution to those problems, than to begin initiation and implementation only to discover it won't solve the problem you are trying to fix.

Proving or Disproving the Identified Problem

As you prepare to delve into your analysis to prove or disprove the identified problems it is important to keep a few things in mind. The two types of questions the preparer of the analysis should ask themselves are what and how? *What* type of analysis and data do I need to gather in order to prove or disprove the identified problem and solution and *how* do I prove or disprove the identified problem and solution?

Proving or Disproving the Problem through Analysis: What Type of Data?

The analysis needs to be designed by keeping a focus on what data will give the project team the most confidence that the problems already identified are truly the root causes of the underperformance of the firm. A correctly identified problem will fit the data, confirming that it is the root cause.

How the Data Proves/Disproves the Problem

In the Bodies of Steel case study, data showing frustration due to sub-par customer service directly affecting new customer sales and customer retention would effectively prove that this is indeed the root cause of

underperformance relative to its competitors. Showing that firms without the problems associated with poor customer service exhibit higher new sales and higher customer retention than firms with similar customer complaints to Bodies of Steel would confirm that the problems previously identified are correct. When looking at whether higher costs of clerical personnel are a root cause of Bodies of Steel underperformance, it would make sense to capture data showing a consistent relationship between firms who have lower cost of clerical personnel and higher performance. For example measures might include profit margin, return on sales and other measures deemed to be important to the firm or industry. Conversely, data that would show that other factors are indeed primary root causes of the underperformance of the firm disprove the identified problems.

Things to Keep in Mind

After determining the type of data and the measures and metrics that will best prove or disprove the identified problem, it is helpful to map out your analysis *before* you begin to gather and accumulate the data. If you make a map beforehand, once you accumulate the data, it will make it much easier for you to keep track of your analysis as well

as to later present your findings to your team and the management. This will also serve as a check during the data gathering process that you are indeed gathering the proper data, as well as aid in the interpretation of it afterward.

Proving or Disproving the Defined Solution

Introduction:

Designing the analysis to prove or disprove the defined solution is to be done in a similar manner to the one to prove or disprove the identified problem. We will focus on what data needs to be gathered in order to prove that one particular solution, in our case, solution 3, is the best solution to all of the component problems while still being within the boundaries of scope defined in the previous section.

Just as in the problem analysis, an indication of what data is needed will become clear once how the solution will be proved or disproved is determined. In the Bodies of Steel example, metrics and correlations need to be chosen that clearly show whether or not solution 3 best solves all of the component problems within the boundaries of scope for the problems identified. These could be calculations

showing the estimated costs and benefits of taking the actions prescribed in solution 3, indicating the net benefit relative to a business as usual (BAU) scenario. Calculations showing the comparison to the other prescribed scenarios could also be shown, indicating both quantitative measures such as net benefit-cost analysis, as well as how each solution compares in solving the component problems within the identified scope. If another scenario were to be proven a better solution, then solution 3 would be disproved.

Again, a formatted list or map of the data you are to gather in order to prove or disprove the validity of the solution you have defined is helpful in aiding the process of gathering *and* interpreting of the data.

It important to incorporate intuition as well as your knowledge of the industry and market into your analysis as you begin to gather and interpret the data. A solid foundation can be built solely on the data gathered; however it is the specific industry, geographic and/or firm knowledge that will provide the intuition necessary to correctly identify the problem and its corresponding solution. This also emphasizes the importance for management and those taking part in project research to be educated about the nuances and relationships specific to

the industries, geographic regions and firms that they are analyzing.

Gathering the Data

Introduction:

After designing an analysis in order to prove or disprove the identified problems or needs and the corresponding solution for Bodies of Steel, it is necessary to perform the mundane yet essential function of gathering the data necessary to perform the analysis.

Methods in Gathering Data

The methods in which to conduct data gathering and research will vary widely depending on the size and scope of the project, as well as the geographic region, sector, industry and firm one is gathering data for. It is important to do some homework in order to find out what resources will likely give the best data needed for the analysis. Finding out where data will come from beforehand will make the research phase much more efficient and effective.

Since Bodies of Steel is a smaller, local firm, the appropriate data will most likely come from internal sources- things like current profit margin and other

metrics, as well as current management's strategy on organizational structure and operational tactics. A record of current employee salaries is also necessary to obtain for the analysis we have created. Finally, a bit of outside research will need to be done in order to determine the true costs and impact of whichever software package is chosen by the firm. Measures such as cost, steps to install and implement the software and new reservation process, as well as the reviews and a summary of the capabilities of the product will also be important in completing the analysis.

Interpreting the Results

Introduction:

The final step in framing is interpreting the results of your analysis. Remember that your interpretation should be geared towards proving or disproving the validity of your identified problem and defined solution. It is important however to note that you should not fit the data to your identified problem and defined solution. Instead it is crucial that you gather good data and evaluate whether there is a correlation between the data you gathered and the identified problem and solution.

Things to Be Aware of

You should also be aware of two components while interpreting your data. Internally, you should be piecing together a picture or summary of your hypothesis that will lead to action and a recommendation. Externally, in turn you should begin assembling the key facts into an end product that you will use to communicate your end recommendation to you client.

Interpreting the Data Gathered for Bodies of Steel

Now we have assumed that we've gathered data that shows that firms with similar customer complaints about scheduling and the front desk exhibit lower new customer volume and less customer retention than similar firms without these problems. In fact we've found that there are a number of firms in the industry with online registration systems that have a significantly higher number of new memberships and better customer retention. This adequately proves that the identified problem is indeed the root cause of Bodies of Steel's relative underperformance. We have also found data that shows that similar industry competitors with lower relative clerical personnel costs have higher gross margins and higher profit margins- the measures we decided to use- than those with relatively

higher clerical personnel costs. This confirms that Bodies of Steel's higher relative clerical personnel costs are also a root cause and driver of the firm's underperformance. An online registration system has been proven to be the best solution to both of the identified problems.

The following worksheet can be used to perform the analysis described in chapters' three, four and five.

Project Purpose Breakdown
Date: February 1, 2XXX **Company:** Bodies of Steel (BOS)
Framing the Business Problem: **Problems/needs of the business:** 1.Competitive- Competitive need to cut clerical costs, develop a more competitive cost structure relative to industry peers 2.Operational- Overworked and ineffective front desk personnel, causing a large increase in time needed to process reservations and scheduling requests

Scope of the potential solution:

1.Online system must be within the cost budgeted for the project

2.Online system must not create other problems for BOS that will negate the solution provided

3. Firing and re-hiring new employees does not solve the competitive clerical cost problem due to the cost to fire existing employees and hire and train new ones

4. The solution must be implemented within the timeframe determined by BOS management

Defining the solution in terms of component elements:

1.Competitive Need- The defined solution of an online reservation system needs to adequately solve the competitive need to cut clerical costs by replacing reoccurring clerical costs with a onetime purchase and implementation of the online reservation system

2.Operational Problem- The defined solution of an online reservation system needs to adequately solve the operational problem of an ineffective and inefficient front desk by allowing customers to go online and see all options for reservations and selecting the one that best suits their needs

Proving the Identified Problems:

1.In order to prove that the competitive and operational problems we've identified are indeed to root cause of the underperformance of Bodies of Steel, we are looking for:

a. Data that shows that firms with lower clerical costs also show higher numbers in metrics such as gross profit and net profit

b.Data that shows that firms with better reservation systems than that of BOS, particularly *online reservation systems*, exhibit higher new customer sign-up and higher current customer retention

Proving of the Defined Solution:

1.Data must show that the online reservation system that BOS is considering is within the defined boundaries of scope such as: cost, quality, scope and the time allotted for the project by management

2. In terms of Component Elements: Data must show that the online reservation system that BOS is considering implementing adequately solves the competitive need to lower clerical costs, and operational problem of providing customers with a viable reservation mechanism in a timely manner.

Interpreting the Results:

Proving the Problems:

1. We gathered data that shows that firms with similar customer complaints about scheduling and the front desk exhibit lower new customer volume and less customer retention than similar firms without these problems. We also found data that shows that there are a number of firms in the industry with online registration systems that have a significantly higher number of new memberships and better customer retention, the ineffective and inefficient registration system now in place is the root cause of BOS's underperformance.
2. We found data that shows that similar industry competitors with lower relative clerical personnel costs have higher gross margins and higher profit margins, than those with relatively higher clerical personnel costs. This confirms that Bodies of Steel's higher relative clerical personnel costs are a root cause of the firm's underperformance.

Proving the Solution:

1. An online registration system has been proven to be the best solution to both of the identified competitive and operational problems, given the

boundaries of scope and problem components.
The Resulting Project Purpose: (see chapter 6 pp.45-48 for more details on how to develop a project purpose statement) "The purpose of this project is to provide customers with self-service registration for athletic facilities to improve customer access, reduce clerical personnel cost and improve facility utilization."

Moving to the Next Step: Initiating the Project

We have now framed and identified the problems for Bodies of Steel: those being the operational problem of an ineffective and inefficient customer service/front desk function; and secondly, a competitive need to reduce the cost of clerical personnel, particularly in the front desk area. We then defined a solution of implementing an online reservation system. We have identified the components of the problem: those being a customer service and cost component identified within the operational and competitive problems. We also identified the scope within which a sufficient solution to the identified problems would be. We then gathered data in order to prove whether or not the problems identified were in fact the root causes of the underperformance of the business and whether the defined solution would indeed properly solve the identified

operational and competitive problems, given the scope of the solution and components of the problem. We then interpreted the data we gathered and found that it did indeed prove the problems of ineffective customer service and relatively high clerical costs to be the actual root causes, and the identified solution of an online reservation system to be the most appropriate method of solving these problems. By confirming the solution of an online reservation system to be correct, we now have identified the purpose of our project. We can now begin to *initiate*, *plan* and *execute* the project with the purpose of implementing our identified solution. The rest of the text will now kick off the project to implement the proposed solution.

6. Project Initiation

a. Project Purpose Statement

Introduction:

The project purpose statement is often the first thing that someone interested in learning more about a project might read or hear from a project team member or another project stakeholder. This purpose statement, like the proverbial elevator speech, should in a few words describe what the project is all about. The purpose statement is part of the project charter that is created during the project initiation phase. (See frame: project charter)

How is it created?

A project purpose statement is relatively short, typically just a few sentences. This is what makes writing one hard, because these few sentences often must describe a project that is fairly complex. In addition the audience reading it can be from different parts of the organization or possibly from outside the organization.

A great way to start writing a project purpose statement is by writing down the problems and/or opportunities the project is supposed to resolve. When writing these make

sure you demonstrate how the problems/opportunities affect the business.

For our gym example, it is not enough to say, "This system will improve customer service and reduce payroll costs." Instead you should describe the problems and opportunities addressed by the project along the following lines:

- "Our facility is overcrowded at some times, when several people who have been unable to make reservations show up at the same time, and underutilized at other times, when people who might have come haven't been able to get through to make reservations.
- Our front-desk employees spend an average of three hours a day taking telephone reservations, mostly at mealtimes and just before closing. As a result, the employees work longer hours than scheduled (and are paid for overtime) and are not productive at their other tasks. We therefore have an opportunity to reduce personnel costs while getting more work done and improving client satisfaction."

Project Purpose Statement

Once you have described the problems and opportunities you can articulate the project purpose. In our example, the project purpose is the following:

"The purpose of this project is to provide customers with self-service registration for athletic facilities to improve customer access, reduce clerical personnel cost and improve facility utilization."

You must be very careful to state the purpose in business terms. The statement should be short, yet clearly understood by management and other stakeholders. It is best to use the stakeholders' own words to describe the problems and opportunities and how your project will address them.

What it isn't:

You should avoid using technical terminology, as in the following sample purpose statement:

"The gym's server must be upgraded from a Dell Dimension XPS R450 to a Sun Microsystems E450 w/2 Gig RAM, 2 X 400Mhz Processors, 4MM Tape Unit(X6261A), CD ROM, 4 X 18Gb Drives, PGX Video and Country Kit. This upgrade will enable Bodies of Steel to implement web based facility registration."

While this statement would be very understandable to the IT department and possibly to your project team, most of the information in it would be irrelevant to other stakeholders: management, clerical personnel and customers.

How do you know when you are done?

A great way to test your project purpose statement is to try it out on a few people not on the project team. Share your project purpose and ask the person you are testing it on to describe the project to you in more detail. If a few different people can do this to your satisfaction, you have written a great project purpose statement.

b. Measurable Objectives

Introduction:

A good way for an organization to know if a project has been successful is by painting a picture of what the project will produce at its conclusion. "If you don't have a clear destination in mind, any old path will do." (Source unknown) Defining measurable objectives is a great way to paint a picture of the project's destination. These objectives are part of the project charter (see project charter frame) and are listed right after the project purpose.

You may have thought that the purpose statement will do this for your project; although it provides important information regarding the project's purpose, it does not provide a way to measure if you have accomplished your purpose at the end of the project. The only way the organization will know if the project has been completed successfully is if you have established measurable objectives up front, which define how well you have solved the problem or seized the opportunity that made you undertake the project in the first place. As Peter Drucker puts it, "What gets measured gets done." By describing the

purpose and objectives in business terms, you make clear what the stakeholders can and cannot expect of the project.

How are Measurable Objectives Created?

Developing measurable objectives which link your project objectives to the overall business problems and/or opportunities is critical to making sure your project gets the resources it needs to be successful. Otherwise management probably won't understand the value your project is providing to the organization and other projects may get their attention.

Remember what our organization's problems are from the case: "Our facility is overcrowded at some times, when members who have been unable to make reservations show up at the same time, and underutilized at other times, when people who might have come haven't been able to get through to make reservations;" and "our front-desk employees spend an average of three hours a day taking telephone reservations, mostly at mealtimes and just before closing. As a result, the employees work longer hours than scheduled (and are paid for overtime) and are not productive at their other tasks. We therefore have an opportunity to reduce

personnel costs while getting more work done and improving client satisfaction."

From this we wrote our project purpose statement: "The purpose of this project is to provide customers with self-service registration for athletic facilities to improve customer access, reduce clerical personnel cost and improve facility utilization."

Using this information as the starting point, we can write measurable objectives for our project. Keys to writing good measurable objectives include: objectives can be accomplished by the team within the timeframe allocated; when accomplished the project team can measure that the objective has been completed; objectives are clear enough that the project team understands what they must do to accomplish the objectives. Measurable objectives for the University Athletics system might be:

- Provide a way for customers to self-register for center facilities.
- Reduce clerical costs by 20% per year.
- Expand the hours where customers can make reservations to 24 hours per day, 7 days per week.

- Improve center utilization to 65% during off-peak times (off-peak is Monday to Friday between 9 AM and 4 PM and all day Saturday and Sundays).
- Implement the new registration system by October 1, 20XX, in time for the busy fall season.

Each of the above objectives is measurable. At the conclusion of the project, you can easily determine (measure) if you have accomplished them or not. At the same time these objectives provide enough information for the project team to use to make decisions about how to implement the new self-service registration system. For example, the project team knows they must implement a system that allows customers to self-register, and that they have to do this by October 1st. Based on these objectives, the team can quickly start to narrow in on solutions that meet these requirements and eliminate others that do not.

You should also work with management to prioritize these objectives so that the most important are given the most attention throughout the process. For instance if center utilization is more important than reducing clerical costs, the team may spend more time on improving utilization than

on finding ways to reduce clerical costs. If reducing clerical costs is more important, the team may find that sacrificing a few percentage points of utilization helps them achieve the cost savings. The project team will be faced with many decisions throughout the project; these prioritized objectives will help them make better decisions in a timely manner.

Prioritized Measurable Objectives:

- Provide a way for customers to self-register for center facilities.
- Expand the hours where customers can make reservations to 24 hours per day, 7 days per week.
- Implement the new registration system by October 1, 2XXX, in time for the busy fall season.
- Reduce clerical costs by 20% per year.
- Improve center utilization to 65% during off-peak times (off-peak is Monday to Friday between 9 AM and 4 PM and all day Saturday and Sundays).

To be convincing when you measure the project results at the end, it is important to have collected this same data at the start of the project for comparison purposes. In the

example of University Athletics, the team spent some time up front actually measuring things like the time spent on hold, wait times, actual facility utilization, and so on. You should then ask management and other stakeholders to sign off on these figures, which represent the "as-is" state and can serve as a basis for comparison at the end of the project.

What Measurable Objectives are not!

Measurable objectives are still specified at a fairly high level and have to be further defined into a set of project specifications or requirements. For example it is clear that a new system must be created where customers can self-register, but it is not clear from this information the form that this system will take. Self-registration could be handled by a third-party, done over the telephone or by using a web based system among other potential solutions. These details will be determined during the project planning phase. (See project deliverables for more information)

How do you know when you are done?

Review your objectives against your project purpose and the business problems and/or opportunities. It should be clear

that once these objectives are met, the project purpose and business problems/opportunities are also met. If this is not the case, you need to continue to either identify additional objectives or modify these objectives to address these needs.

These objectives are included in the project charter. (see project charter) Now you can start to identify project scope. (see project scope)

c. Scope

Introduction:

Project scope is created during the initiation phase and is part of the project charter (see project charter frame). The project scope is simply what must be done (in-scope) and what will not be done (out-of-scope) to accomplish the project objectives. Since you have already defined these objectives in measurable terms (see measurable objectives frame), it should be relatively straightforward to identify what is included in the scope (in-scope) and what isn't (out-of-scope).

In-scope is anything we will have to perform to address the problem or opportunity we are working on during the

project. Out-of-scope is anything that is either not related to what we are working on or which is related, but not necessary to complete to achieve our project objectives. Although it would be nice to be able to work on every aspect of the project, this is not realistic. All projects have limited time and resources (money, people, and equipment) in which they must be completed. By limiting our scope, we can make sure to focus on those things that must be done to achieve our project objectives in a reasonable period of time for a reasonable amount of resources. These out-of-scope items can be reassessed and done during future projects if it makes sense to do so.

How is it created?

In order to begin determining what is in and out-of-scope, make a list of everything that you think must be done to achieve the project's objectives.

Our project objectives as of February 23rd, 2XXX:

- Provide a way for customers to self-register for center facilities.
- Expand the hours where customers can make reservations to 24 hours per day, 7 days per week.
- Implement the new registration system by October 1, 2XXX, in time for the busy fall season.

- Reduce clerical costs by 20% per year.
- Improve center utilization to 65% during off-peak times (off-peak is Monday to Friday between 9 AM and 4 PM and all day Saturday and Sundays).

Based upon these objectives, we brainstorm with our team in order to compile a list of things to be completed in order to achieve them.

Our list for our case:

- Design a self-registration system for services that require reservations (this is the most realistic option for a 24/7 registration system where we are trying to save money on front-desk staff)
- Determine how members utilize services that typically do not require reservations such as open-swim, free weights and the restaurant/bar
- Identify self-registration system solutions used by other gyms or membership organizations
- Pick a self-registration system to use
- Identify new products and services which will attract members to use our facility during off-peak times
- Develop and install the new system

- Test the new system
- Train users on the new system
- Increase membership
- Add new functions based on user feedback
- Promote the new self-registration system with members
- Survey existing center utilization during off-peak times (9 am to 5 pm on Monday to Friday and on weekends)
- Reassign/fire clerical staff
- Identify ways to increase utilization during off-peak times
- Increase the size of the gym

Now review this list to determine which of these items must be done to achieve our objectives and which ones can be put aside or done by other project teams. Clearly we must select and implement the new self-registration system, train users on the system and promote its use with our members. We also must survey member utilization during off-peak times and identify ways to increase utilization during these times in order to achieve our objective "improve center utilization to 65% during off-peak times."

At the same time increasing membership may seem like something we must do to complete this project, but it is of such a large scope in and of itself, we have decided to leave this out-of-scope of our project with management's approval. By leaving this out, we can still achieve our project's objectives. In addition, by leaving it out as we brainstorm ways to improve center utilization, the team will know not to include any items that would require adding new members (or at least note ideas for future projects). So after brainstorming with our project team and reviewing this with management, we have identified the following for project scope.

Project In-Scope:

- Increase non-peak center utilization
- Decrease clerical costs
- Positively impacting the fun atmosphere
- Promote the new system with members
- Address basketball, racquetball, weight stations, swim lanes, pilates and personal trainers

Project Out-of-Scope:

- Increase peak center utilization

- Increase the size of the gym
- Add new products and services
- Increase membership
- Reassign clerical staff
- Fire clerical staff
- Assist clerical staff with new employment
- Free weights, open swim, restaurant and bar

As a project progresses, the scope may need to change. The team may discover unforeseen difficulties as they get more and more into the details. The team may also discover that some objectives cannot be met without compromising the budget or the deadline. Finally, external conditions may change: the competition or the regulatory environment may change management's priorities. Management may then decide to change the objectives (and therefore the scope) of the project. After having set the initial scope, the project manager must therefore be prepared to maintain it over time, continually keeping the team and other stakeholders informed of any changes. Since scope is defined in the project charter and the charter is approved by management, the project manager must get approval from management for any changes in project scope.

Changes to scope are not necessarily bad if they improve the projects chances of success as defined in the project charter. They are bad if you are adding additional requirements and/or improving product quality that was not defined in your project charter (This is commonly referred to as gold-plating). If you are constantly changing the project scope, you will never finish the project. As the project manager you must be make sure that you and your team can spot any changes to scope and assess their impact on the project cost, schedule and quality prior to requesting the change be approved by management (see triple constraint).

One of the biggest problems projects face is commonly referred to as scope creep, when the scope gradually increases over the course of the project. This usually occurs when users and team members get overenthusiastic about what the system can do – "If we just add one or two simple items to the scope…" – and keep adding little items one at a time, until the project timetable and budget must be revised. These changes are not necessary to achieve our project objectives. By clearly defining measurable objectives and project scope up front, making sure your

project team and project stakeholders understand scope and monitoring it continuously throughout the project, you can reduce the chances of scope creep happening to your project. For our project, the new self-reservation system can always be improved upon, and the same is true for clerical efficiency and center utilization. Your focus must be on achieving the projects objectives which include schedule and budget constraints. In order to do this, you must not allow scope creep. A better way to handle this is by noting these "improvements" and dealing with them on future projects.

What it isn't:

It is easy to confuse scope with objectives. Although it is related, it is also different in a very important way. Scope is different than objectives because it differentiates between work that you will and will not do to achieve these objectives. This is not made clear in project objectives, so scope helps you further clarify what work you will do to achieve them. This is critical to your project if you want to complete it within time and budget!

How do you know when you are done?

With scope you are never done! You must diligently watch to make sure that only work which is in-scope is being done throughout the project. At the same time as project team members and other stakeholders approach you with work that is out-of-scope, you must assess whether this will require a scope change. Avoid this whenever possible and push for this work to be done in another project. This is one of your most important jobs as project manager!

d. Assumptions

Introduction:

According to the Merriam-Webster dictionary an assumption is: "to take as granted or true." We all make assumptions every day; unless we confirm these assumptions with whomever we are working, these may in fact be false and could have a significant negative impact on our project success. What makes assumptions difficult to identify is that they are largely made at the unconscious level; they define who we are and how we think often based on our cultural background. When you bring different people together to work on a project, they typically come from different backgrounds (cultures) and therefore make different assumptions. These assumptions must be made

explicit so that the project team and other stakeholders have a clear understanding of one another and of the project.

How are Assumptions Identified?

Let's start with our project. As we define the elements in our project charter, we must ask ourselves what must happen for this element to be true. One of our objectives explicitly stated that we will reduce clerical costs by 20%. For this to be true a number of things must happen. This includes a new system that members can use to register must be accessible to and used by our members. These things are explicitly stated in our charter. At the same time for this to be true, we can't lose all of our clerical staff during the transition to the new system. If we do, we will have to hire and retrain new staff along with dealing with other disruptions to customer service. This will cost us money, distract us from our project and create customer service problems during the transition to the new system. Of course this makes perfect sense and everyone on the project team was aware of this, even though it wasn't explicitly stated; maybe or maybe not.

Either way, this assumption must be stated explicitly so we can manage it during the project. Our assumption is as follows and noted in our charter:

"Front-desk clerks adversely affected by the project changes will get assistance with either finding a new job within the gym or if they choose with another organization. Currently we expect that 15% of our clerical staff will be impacted by this change. This will be clearly communicated to the staff affected at the beginning of the project by the project sponsor. A bonus of $500 will be paid to front-end clerks who continue with the gym until the self-registration system is being used by more than 50% of our members."

What Assumptions are not!

Project assumptions are not the objectives, deliverables or requirements. Assumptions simply help clarify for our project team and stakeholders what we mean when writing these objectives and other elements of our project plan.

How do you know when you are done?

Most of the assumptions you will identify will be during the project planning phase as you are defining the project. A great way to confirm that the project team and your

stakeholders understand the plan (and therefore all critical assumptions have been made explicit) is by having them tell you in their own words what the project outcome will be. This will be a back and forth discussion during which either additional assumptions will surface or no additional assumptions will be identified. You will need to do this with all project team members and key stakeholders. We have found that doing this as a group both saves time and creates an environment more conducive to identifying implicit assumptions.

e. Project Manager Authority

Introduction:

As a project manager you are given responsibility to complete the project. In our project, this includes increasing utilization to 65% during off-peak times no later than the project completion date agreed to in your charter. Merriam-Webster dictionary defines this as: "moral, legal, or mental accountability". So as project manager, you are accountable for completing these project objectives. If you don't complete the project as expected, you may get passed over for a promotion, not receive a bonus, or any number of different consequences. On the

other hand authority is defined by Merriam-Webster dictionary as: “power to influence or command thought, opinion, or behavior”. This is very different from responsibility. This is power to make things happen, and without authority you may find you cannot fulfill your responsibilities. Identifying and getting the authority you need as project manager is critical to your project’s success.

How is it created?

A project is an organized activity with a well-defined purpose, completed by a dedicated project team within a given timeframe. In order to achieve this purpose, you will need to gather the right resources, while also having to make many decisions throughout the course of the project. In fact we have already made a number of decisions for our project, including what are our measurable objectives, which one is the highest priority, what is in and out-of-scope, etc. As we move forward, we will have to identify and recruit our project team, recommend and select the appropriate technology for our self-service system, identify and recommend ways to increase utilization that may require changes to our membership fees, etc. The project manager may have project

team members that do not report to her, yet needs to control what they are working on and when this work will be completed. Without this authority, the project manager cannot be confident this work will get done as defined in the project schedule and budget.

Another challenge the project manager faces is decision-making; these take time, and if we cannot make these decisions ourselves, someone has to make them for us which takes more time. Determining what decision-making authority you need as project manager, defining this in your project charter and getting management's approval are key to your success.

On our project, we were given a fixed deadline to complete the project. So clearly we must work within this time constraint (a constraint is something we cannot change). This means that we still have some control (authority) over cost, scope and quality of the project deliverables. We should make sure to get authority for these so we can keep the project moving forward in a timely manner. Based upon this, we have identified and asked for the following authority:

Project Manager Authority:

- Determine the project approach, including milestones; deliverables; and scope.
- Determine project resource requirements, including funding, people and equipment.
- Determine how to allocate/reallocate project resources throughout the project.
- Fire project team members.
- Identify and communicate directly with all project stakeholders as the project manager sees fit.
- Determine which recommendations to implement if the project sponsor/project stakeholders do not provide this feedback within three business days of it being requested.

The more authority you can get the better, but be reasonable and only ask for things that will impact your project. The two most important areas are control over resources (people, money, equipment) and a streamlined decision-making process. Notice above we have asked for and gotten the authority to pick our team, control over their schedule, the authority to communicate with our stakeholders as we see fit; finally we also have the

authority to make project decisions if our stakeholders do not provide timely feedback to us.

What it isn't:

As was stated in the introduction, authority is much different than responsibility. These are often confused by management who will give you responsibility without hesitation. Congratulations they will say you have been promoted to project manager. Then you are given some impossible task that three others before you have failed to accomplish. You must make sure to get the authority you need to be able to accomplish your responsibilities.

How do you know when you are done?

Knowing what authority you need to be successful on a project is not an easy task. Just as with many other things related to project management, this will come with experience. So until you have done a few projects like this one, check with other project managers who have this experience. Be specific and ask them directly what authority they needed to be successful. Share with them what you are being asked to do and listen to where they think you will have difficulty. Based on this information, determine what authority you need to be successful and get

their feedback on it. Finally, if you are not given the authority you think you need to be successful, make sure to inform your sponsor. What is worse failing at a project or making a little noise so that you can significantly improve your chances of success?

f. Deliverables

Introduction:

A deliverable is the output of a project. These are the things that you must create and deliver to your project stakeholders in order to achieve your project purpose and objectives.

How are Deliverables Identified?

Start with the project's purpose, objectives and scope, use this information to identify what you will need to produce for your stakeholders in order to complete the project. Some of these deliverables will be very similar to your project objectives. For instance one of our deliverables for our project will be creating a system that members can use to make reservations for our facilities. Others will not be so obvious but absolutely necessary for the project to be successful. An example might be promoting the new system with members so they will use it. Remember what

Steven Covey said “Begin with the end in mind.” Deliverables help you and your stakeholders visualize the end of the project.

After reviewing the project purpose, objectives and scope, the project team developed a list of project deliverables as follows:

- Analysis of current facility utilization during off-peak times
- Analysis of clerical costs pre-implementation
- Recommendations for increasing off-peak utilization
- Self-service registration system requirements
- Self-service system technology selection
- Working self-service system
- Promotional materials/incentives to generate system usage
- System training materials and training
- Analysis of clerical costs post system implementation
- Analysis of post-implementation facility utilization during off-peak times

What Project Deliverables are not!

Project deliverables are not a list of detailed work that has to be done to complete the project. You will use these deliverables to develop that list when you create your project work breakdown structure. (See work breakdown structure)

How do you know when you are done?

The way you will know when you have completed your project is when your stakeholders tell you that you have delivered on your promises. They will do this by reviewing your deliverables and providing you with their signature of acceptance. This occurs throughout the project not just at its completion. Note that many of the deliverables are completed and delivered to the stakeholders during the course of the project. An example is the self-service registration system requirements. By developing these and getting approval as early as possible in the project, we reduce our risk of producing a system that does not meet our stakeholder's needs.

Draft Project Charter – February 23, 2XXX – Version 1.0

(Created by the project manager with stakeholder input and management sign-off)

Project Purpose: This project is meant to provide customers with self-service registration for athletic facilities to improve customer access, reduce clerical personnel cost and improve facility utilization.

Prioritized Measurable Objectives:

- Provide a way for customers to self-register for center facilities.
- Expand the hours where customers can make reservations to 24 hours per day, 7 days per week.
- Implement the new registration system by October 1, 2XXX, in time for the busy fall season.
- Reduce clerical costs by 20% per year.
- Improve center utilization to 65% during off-peak times (off-peak is Monday to Friday between 9 AM and 4 PM and all day Saturday and Sundays).

Project Manager Authority: In order for this project to be successful, the project manager will need the authority to:

- Determine the project approach, including milestones; deliverables; and schedule.
- Determine project resource requirements, including funding, people and equipment.
- Determine how to allocate/reallocate project resources throughout the project.
- Fire project team members.
- Identify and communicate directly with all project stakeholders as the project manager sees fit.
- Determine which recommendations to implement if the project sponsor/project stakeholders do not provide this feedback within three business days of it being requested.

The project manager does not have the authority to do the following without first getting the project sponsor's approval:

- Cancel the project.
- Increase project funding beyond what is approved in the project plan.

- Extend the overall project timeframe beyond six months.

Project In-Scope:

- Increase non-peak center utilization
- Decrease clerical costs
- Positively impacting the fun atmosphere
- Promote the new system with members
- Address basketball, racquetball, weight stations, swim lanes, pilates and personal trainers

Project Out-of-Scope:

- Increase peak utilization
- Increasing the size of the gym
- Adding new products and services
- Increasing membership
- Reassign clerical staff
- Fire clerical staff
- Assist clerical staff with new employment
- Free weights, open swim, restaurant and bar

Project Assumptions:

- Utilization analysis will be conducted for five different days/times for each product/service offering in scope at the beginning of the project and then again for the same days/times at the conclusion of the project. This will be done three different times at the beginning and at the end of the project. An average of these wait times will be used for comparison purposes. These days/times and locations will be determined by the project team.
- Front-desk clerks adversely affected by the project changes will get assistance with either finding a new job within the gym or if they choose with another organization. Currently we expect that 15% of our clerical staff will be impacted by this change. This will be clearly communicated to the staff affected at the beginning of the project by the project sponsor. A bonus of $500 will be paid to front-end clerks who continue with the gym until the self-registration system is being used by more than 50% of our members.

Deliverables:

- Analysis of current facility utilization during off-peak times
- Analysis of clerical costs pre-implementation
- Recommendations for increasing off-peak utilization
- Self-service registration system requirements

- Self-service system technology selection
- Working self-service system
- Promotional materials/incentives to generate system usage
- System training materials and training
- Analysis of clerical costs post system implementation
- Analysis of post-implementation facility utilization during off-peak times

Approved by:

Project Sponsor: *James Marlatt* Date: February 26, 2XXX

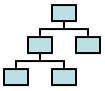
--

7. Project Planning

a. Work Breakdown Structure

Introduction:

Congratulations, you have completed your project charter and gotten it approved by management! A work breakdown structure (WBS) is the next thing you should develop. A WBS is just what it sounds like, a tool that helps the project team identify and break down all the work that needs to be done to accomplish the project's objectives. Because of the way it is represented (tree structure),

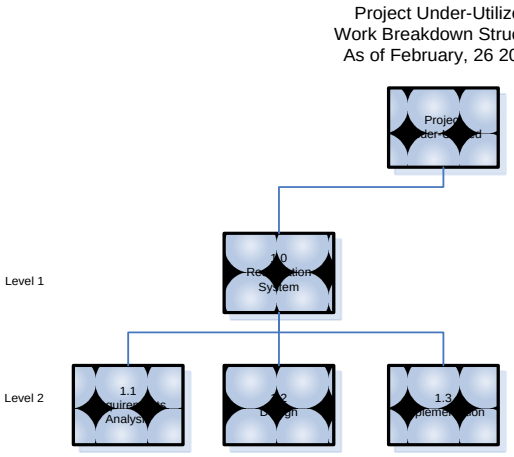


it is easy for the project team to see how their individual efforts help accomplish the project whole. In other words divide and conquer. It also is an easy way for the project team to identify if any important work is missing from the plan. This is done by reviewing the activities listed on the WBS as part of a team meeting(s) and walking through the tree to determine if what is shown there addresses all the work that needs to be done as defined by the project charter.

The WBS is used as input into the scheduling process which comes next.

How is it created?

There are many ways to approach creating a WBS. One of the easiest is to start with your project deliverables and determine what work needs to be done to complete these. For example with our project, one of the deliverables is a new web-based reservation system. So we would add a box at level 1 labeled "reservation system". The software development approach our organization follows includes "requirements analysis", "design" and "implementation" which are added on level 2 just below the box "reservation system" and so on.



Of course there are other ways to determine the work that needs to be done to complete the project. In the construction industry it is common to use a methodology for building a building. This methodology can be used to as the starting point to define the work that needs to be done

in order to complete the project. For instance the level 1 steps might include: “estimating; scheduling; purchasing/budgeting; construction; customer service/warranty”. It is not uncommon for different industries to have their own unique terminology and approaches. The WBS is easily tailored to meet these specific needs.

What it isn’t!

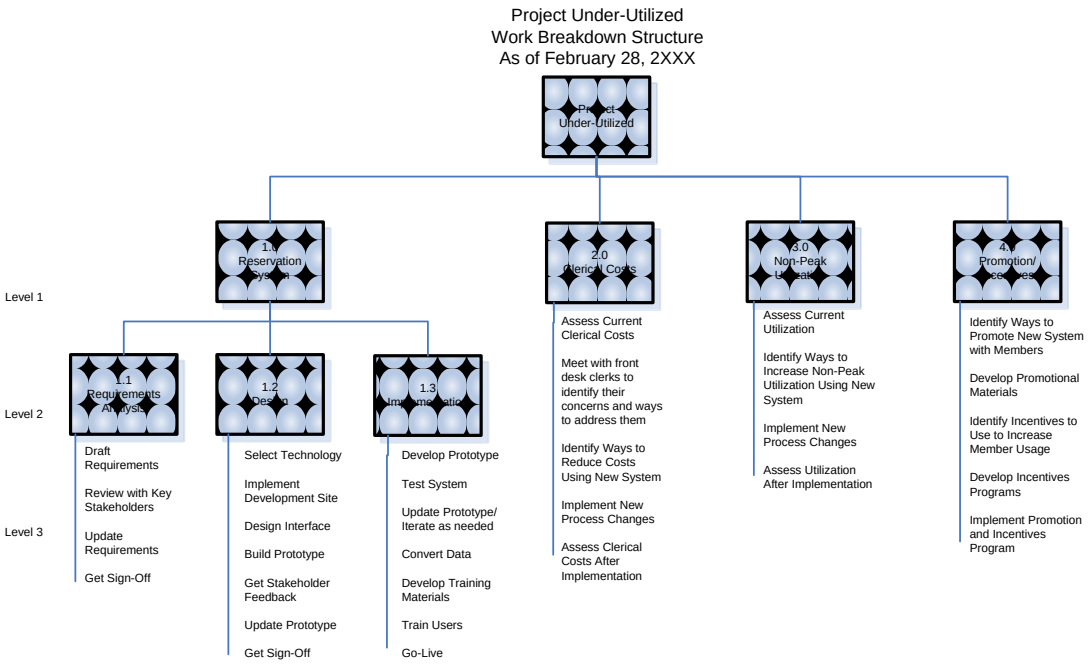
A WBS is not a project schedule. It doesn’t show dependencies, activity durations or resource responsibilities. The WBS is used as input into developing the project schedule which comes next in the planning process. So a WBS doesn’t show work in the order it is to be performed, who will do the work nor when the work should be completed. All of these details are in the project schedule.

How do you know when you are done?

As with any project, you will rarely achieve perfection. This should not be your goal either; rather you should make sure to complete the work necessary to achieve the level of quality, time and cost expected, no more and no less. If you have not had much or any experience with this type of

project, you should make sure to get at least one if not more people with experience on a similar project to review the WBS to determine if you have missed anything important. One reason many organizations have developed methodologies for different project types is to address this very problem. By following the methodology and referencing examples of deliverables from past projects, a project manager can achieve a reasonable level of comfort regarding their WBS and other deliverables.

First Draft WBS



b. Schedule

Introduction:

Often we jump from crisis to crisis rather than focusing on those tasks that will help us reach our objectives. Whether it is your own life or the project, staying focused on those things that bring the most value is key to your success. Often 20% of the activities will bring 80% of the value. A project schedule is used to help the project team focus on what is important by defining in detail what needs to be done (tasks and deliverables) by whom and when in order to achieve project success.

How is it created?

The entire team should be involved in the creation of the project schedule wherever possible. In my own experience, I have consistently observed that when people are involved in planning their own work, they are more committed and satisfied. In order to involve the entire project team, the work should first be broken into smaller more manageable tasks. This was already done for our project when we created the work breakdown structure (see 3a Work Breakdown Structure). These can be further broken down by each project sub-team responsible for the work and then reassembled into the overall project schedule that the

project manager(s) is responsible for overseeing. Often teams use software tools to create and manage these plans. Microsoft Project with the addition of Steel Ray project viewer and schedule protector is a great way to develop and manage your project schedule.

A project schedule should support the overall project objectives by being tied to specific deliverables or results. Project management should manage to the deliverables and not the tasks. For example, it is not important whether you simply finished programming the new module, the importance lies in whether or not the module works and produces the desired results. There should also be several key points or milestones where management can assess the project status and likelihood of success. These milestones are often at the end of each major project phase: analysis, design and implementation.

A project schedule should include the following:

- What work needs to be done (tasks) to create each deliverable
- Who will do the work by task (responsibilities)
- When is the task expected to start and finish

- Identify any task dependencies (a task(s) can't start until another is finished)
- Identify any dependencies on other projects or processes outside of the team's control
- What percentage are we done by task, deliverable, milestone and project

One major problem often encountered on projects is that team members will indicate that a task has been completed, but then continue to work on the task. So although it is marked as 100% complete in the project schedule, it is in fact not done. For example: One team member is writing the user documentation for how to update the facility schedule on the system; the team member indicates this work is done. A second team member responsible for developing the training materials for this process sees the status as done and begins to use this user documentation as the basis for the training material. A third team member responsible for creating on-line help for this function, sees the done status and begins to create the on-line help from this function. In fact the first team member wasn't done and additional changes are made to the user documentation. These changes impact all the work being done by the other team members who have to go back and make changes to their

work. So not only is management reporting incorrect status, there is also a potential that this incorrect information will create significant additional work for the project team.

To minimize the risk of this happening, the project manager must make it very clear to all team members what DONE means; project management must clearly communicate the importance of properly measuring the percent complete for tasks; tasks should be done on time and finally tasks should be signed off by the appropriate team lead as being done before the project schedule is updated with this status. By managing to the deliverables and using milestones, you can reduce the risk of not being sure what the project status is. It is becoming common practice to use only two different measurements for percent complete; one method is the task is 0% complete until it is done and signed-off by the team lead, then it is updated to 100% complete. The other is the task is 0% percent complete until it is started, at which time it is updated to 50% complete; when the task is done and signed-off by the team lead it is marked as 100% complete. The first is a more conservative approach to percent complete, and the second relies on the fact that across many tasks using a 50%

complete for all tasks started but not completed averages itself out to fairly account for overall project percent complete. Earned Value is another way that many organizations are measuring project progress; see Project Cost section 3c for details on how to use Earned Value to manage your project.

To develop the project schedule, start with the project charter and the work breakdown structure. Collect any deadlines that the project must meet, such as the new system must be up and running no later than October 1 in time for the busy exercise season. Gather all project team member's vacation, training and holiday schedules. It is always a good idea to get examples of project schedules from other similar projects.

It is often helpful to find a large whiteboard or get a long piece of butcher paper to draw the initial project calendar on. (Project deadlines, deliverable deadlines, etc.) Using large post it notes, write each deliverable on a note and place it on the calendar. (This makes it easier to move the deliverables around during the brainstorming session) Arrange these deliverables on the time line that meets the project's deadlines in the logical order they

will be created. For each deliverable agree on which sub-team is responsible for its completion. This is referred to as the project deliverable schedule.

A Portion of the Deliverable Schedule for the Reservation System

Draft Functional Requirements By 3/19/20XX Functional Team	Project Development Site 3/30/20XX Technical	First Iteration Interface Design 4/15/20XX Functional	First Iteration Prototype 5/15/20XX Technical	Second Iteration Prototype 6/15/20XX	Final Functional Requirements By 6/25/20XX Functional Team

Project Team Schedule Notes:

- Yolanda the technical sub-team lead will be on vacation between 4/1/20XX and 4/8/20XX
- Henry the program analyst will be in training between 3/10/20XX and 3/15/20XX
- Mary the self-service process owner will be on vacation between 6/1/20XX and 6/8/20XX

It is fairly common to have each sub-team lead take responsibility for creating their section of the project schedule and driving out the details. So the technical lead would be responsible for all technical deliverables and work with his/her team to define the tasks necessary to complete each deliverable for which they are responsible.

To do this each sub-team should start with the project deliverable schedule and work breakdown structure, then do some more brainstorming to identify all tasks that need to be performed to create each deliverable, ordering tasks sequentially by when they should be done. A great tool for

doing this analysis is below. Several assumptions were made to develop the example tool which follows: It assumes that a rapid application development approach is being used; the prototype will be built during the design phase; a Microsoft development platform and SQL/Server database. This tool identifies time root causes and complexity as a way to estimate project duration. This tool can also be reused on other software development projects.

Software Development Estimating Tool for

Bodies of Steel Self-Service Registration Project

Complexity Factor

Activity	Days	High 2	Medium 1.5	Low 1	Total Days	**Notes**
Project Planning	10			1	10	Use standard planning template
Analysis						
For each process indicate:						
Process automation	20			1	20	Existing registration process will simply be automated so it is self-service
Process improvement	15				N/A	
Process re-engineering	30				N/A	
Number of locations	5			1	5	

Activity	Days	High 2	Medium 1.5	Low 1	Total Days	**Notes**
Number of interviews	.5			10	5	
Number of currencies (excluding USD)	3				N/A	
Number of languages (excluding English)	5				N/A	
Number of interfaces	3		1	2	10.5	Medium complexity interface is with a system no one is familiar with
Number of external Systems/organizations affected by the process	2				N/A	
Total Planning and Analysis Days					50.5	
Design						
Number of screens	2	2	5	5	33	High complexity screens use derived fields to control screen processing; medium complexity screens write data to more than three tables
Number of reports	2	1	1	1	9	High complexity reports uses data from more than four tables to calculate fields; Medium complexity uses data from more than two tables.

Activity	Days	High 2	Medium 1.5	Low 1	Total Days	**Notes**
Number of on-line Processes	3		1	3	13.5	
Number of interfaces	5		1	2	17.5	
Visual design	10				N/A	The design will be consistent with existing Bodies of Steel web sites
Usability issues	10				N/A	System will not be designed to accommodate handicapped users
Total Design Days					73	
Implementation						
Number of screens	2	2	5	5	33	
Number of reports	2	1	1	1	9	
Number of on-line Processes	4		1	3	18	
Number of interfaces	6		1	2	21	
Number of users	1		2	5	8	To be trained
Number of records to Convert (per month of data)	1			30	30	Data requires no reformatting
Extent of user Documentation	10			1	10	Level of detail of documentation, days per process.
Total Implementation days					129	
Total Planning, Analysis and Implementation days					235	

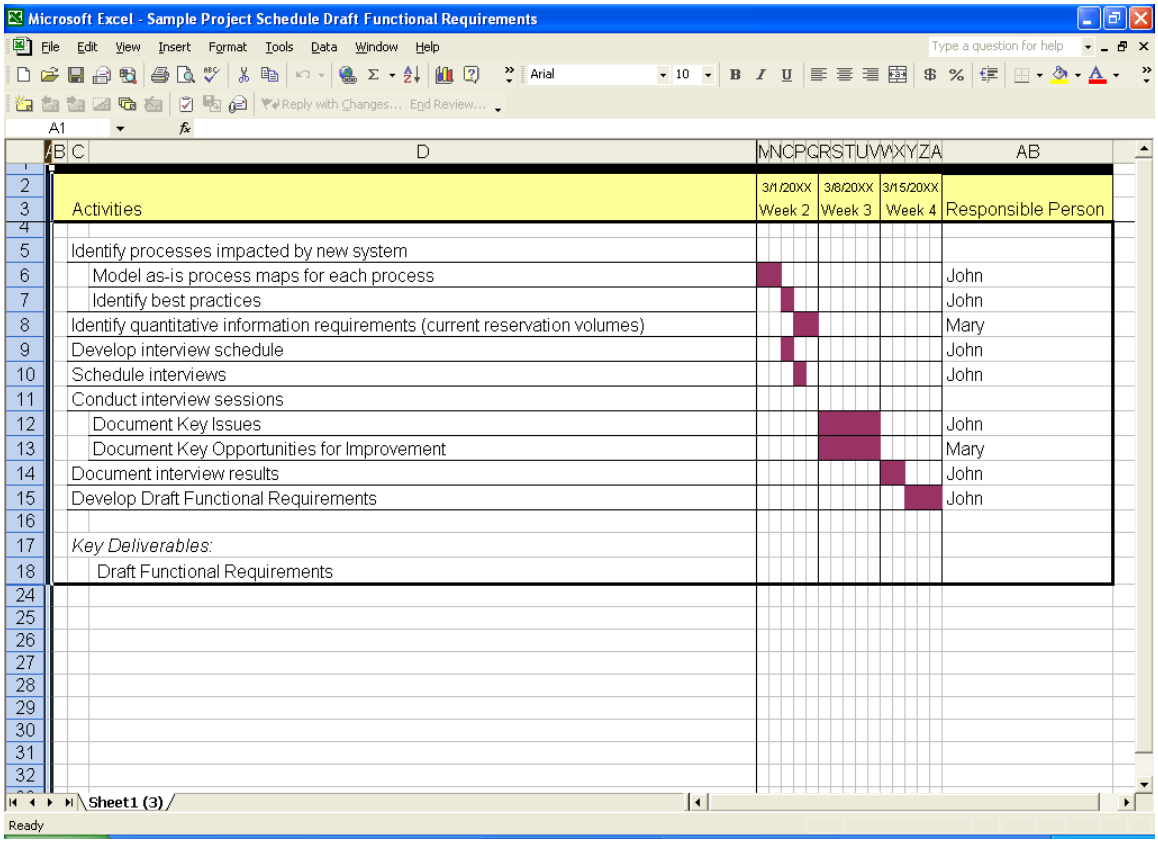
Activity	Days	High 2	Medium 1.5	Low 1	Total Days	**Notes**
Other Factors (multiply total days from previous row by factor)						
Experience of team with Technology		1	1.05	1.1	235	Team has reasonable experience with the technology
Experience of team with the business processes		1	1.025	1.05	235	Team is very familiar with the processes
Reliance on third parties for interfaces, hardware, software, implementation		1.1	1.05	1	235	The team is using one outside contractor who has been working with Bodies of Steel for some time
Organization's readiness to change		1	1.1	1.2	235	Based on prior project experience the organization can accept significant change easily
Management support		1	1.1	1.2	258.5	The project has a sponsor, but it is unclear how supportive the company president is of the project
Ability to make decisions					258.5	Management has agreed to three day turnaround on all decisions and has a history of making decisions quickly
Contingency	1.2				310.2	Since it is still early in the planning stage a 20% contingency will be used for all time estimates
Total Project Days					310.2	

The sub-team lead would use the output from the software development estimating tool to make task assignments based on the team member skills and wherever possible their desires. Once all tasks have been assigned, the project schedule should be reviewed to make sure each team member's workload is reasonable. Tasks are redistributed as appropriate to balance the workload. This is where project management software can help. By putting these tasks, due dates, responsible people, vacation schedules, etc. into Microsoft Project (or some other project management tool), the software can be used to identify schedule conflicts, workload issues, and then the project manager can quickly make adjustments to correct these problems. Any assumptions the team made to complete their project schedule should also be noted. For example the technical sub-team is responsible for installing the software the team needs to do its work, but another department is responsible for ordering and installing the hardware it will run on. The technical sub-team includes several tasks related to defining the hardware requirements and reminding the other department to order the equipment, but still has to make an assumption that the hardware will be ordered and delivered by the due date in the plan.

At this point the project manager collects each sub-team's project schedule and consolidates them into one project schedule. The critical path should be identified, which is all tasks that must be finished before other tasks can begin. Milestone dates should be identified and noted on the work plan and steering committee meetings scheduled to coincide with them. This plan should be reviewed for consistency, completeness, accuracy and logic. This review is first done by the project team, and then reviewed by the project steering committee to help identify any major inconsistencies or omissions. Once this review is completed, this is referred to as the baseline project schedule. Any changes to the baseline schedule should only be made if a change to the project objectives and/or deliverables (see triple constraint 6b) is approved by the project sponsor.

Work plans are living, breathing things. You must monitor them regularly to update them with work that has been completed, while also modifying them to reflect approved changes in the objectives, tasks and responsible people. Since the work plan was developed by the team, you should review the work plan in the weekly status meeting and get each sub-team's input regarding any changes or issues.

Sample Partial Project Schedule for Analysis Phase



What a project schedule isn't:

A project schedule is the project team's best guess at what work needs to be accomplished to achieve the project objectives. This includes both the people and equipment needed to accomplish these tasks and the amount of time to do this work. Because these are estimates, some work will take longer than estimated and other work will take less time to complete. The project manager must be able to understand the big picture schedule as these changes occur

during the project, in order to understand if the overall project schedule is being impacted.

How will you know when you are done?

As with most project management skills, until you have worked on a similar project, you will need to get as much help as you can get from experienced people. You can assume a quality project schedule will be plus or minus ten percent different than what it will actually take to complete your project. You are done with the initial development of this schedule after you have had it reviewed by at least several other experienced project managers for improvements. As you work on the project, inevitably you will find some things take more or less time than you had planned and that new tasks must be added or existing tasks removed from the schedule as project needs change. You should note these differences on your schedule and use this information to review future similar tasks on your project and for use on future projects. These reviews will continue throughout your project and be an important part of your lessons learned documentation (see section 6c, lessons learned).

c. Cost Estimating

Introduction:

Every organization wants to know how much the project will cost, how long it will take and what benefits will be derived from it before they commit scarce resources. Often project managers are put into difficult positions due to unrealistic expectations from the project stakeholders early on regarding the answers to these questions. A key to project management success is to develop a realistic estimate of the work necessary to accomplish the project objectives. This estimate is referred to as the cost baseline. This is also one of the primary reasons project managers must have significant prior experience with similar projects, otherwise it will be nearly impossible for them to estimate the time and resources required to complete the project within a reasonable range.

Project managers can also speak with other project managers within their organization or in others to gather more information (benchmarks). In fact many organizations have developed special tools that a project manager can use to develop these estimates. Usually these tools are created by project managers based on their experience on similar projects. The responsibilities of a project manager are

enormous. Many organizations now offer formal project management training to help increase their project manager's chances of success.

What is it?

Because project cost and time estimates have historically been so inaccurate, many organizations are now putting a time box around the project and asking a different question. Given a fixed period of time and resources, what can be accomplished (as defined by measurable project objectives and scope)?

Project Investment Analysis

Now that the project time estimates have been completed, the project manager can put dollar figures to these estimates and identify other project costs.

The value an organization receives from a project (measurable objectives) is also referred to as project benefits; the investment required to receive these benefits is referred to as project costs. These costs and benefits can be tangible (easy to quantify) or intangible (difficult to quantify). They can also be fixed or variable (costs or benefits change over time).

Organizations have many different ways to determine project costs and benefits; some of the more common approaches are presented here, including a cost benefit analysis, total cost of ownership, payback method, net present value, internal rate of return and return on investment.

Cost-Benefit Analysis

A cost-benefit analysis includes an assessment of four primary areas, tangible benefits, intangible benefits, development costs and operational/maintenance costs. At this point these costs and benefits are merely estimates. As the project progresses these estimates will continue to be refined. At the conclusion of the design phase, the project team can calculate the final project costs and benefits to usually within plus or minus 10%.

Development costs are incurred during the development of the system (onetime costs like developers salaries, initial cost to purchase hardware and software, office space and supplies for the development team, outside consulting costs, etc.), while operational/maintenance costs are incurred once the system is put into use (on-going recurring costs like technical support salaries, software

maintenance fees, software and hardware upgrades, etc.) for as long as the system is being used.

Tangible benefits include things like increased revenues and profits, reduced inventory costs, increased market share, reduced distribution costs, etc.

Intangible benefits are difficult to quantify and based more on best guess than on hard numbers. Things like competitive advantage, improved customer service, improved supplier relationships, improved employee morale, improved image, improved compliance with regulations. (e.g. IRS, State and Local, etc.)

Often you can identify some measures that may help you quantify the intangible benefit once the system is put into use. One example is improved customer service. At Bodies of Steel you currently spend $100,000 per year to takes calls to reserve athletic facilities. If this cost is reduced after you put the new system into service, (which you hoped would help reduce these calls and improve service) it is reasonable to assume that this cost reduction is at least partly due to the new system. Depending on what other initiatives are taking place to

reduce customer calls, you could estimate some percentage of the cost reduction, which is a direct result of the new system.

Another intangible benefit that you can develop measures to help quantify is employee morale. Let's say that before the project, you had 20% employee turnover per year and to hire and train each new employee costs you $5,000. If you can reduce turnover by 20% so that your total turnover is now reduced to 16% or 6 employees per year based on current head count, you could multiply this difference by $5,000 to get your cost savings. Again you might not credit all of the savings to this project depending on what other initiatives are underway in the organization.

The first step to develop a cost benefit analysis is to identify the specific costs and benefits over some predetermined time period. In most organizations, this is usually three to five years. Of course the farther out you go the more difficult it becomes to accurately calculate these costs and benefits. Once cost categories (eg. software maintenance, etc.) have been identified, specific dollar values must be assigned to them.

Bodies of Steel Self-Service Cost-Benefit Analysis

as of 3-30-20XX

	Year 1	Year 2	Year 3	Year 4	Year 5
Benefits					
Tangible					
Salary Cost Reduction	$10,000	$30,000	$30,000	$30,000	$30,000
Increased Memberships due to higher facility utilization	25,000	60,000	60,000	60,000	60,000
Intangible					
Fewer Customer Complaints	10,000	30,000	35,000	40,000	45,000
Employee Retention	10,000	30,000	30,000	30,000	30,000
Total Benefits	55,000	150,000	155,000	160,000	165,000
Development Costs					
Servers	30,000	0	0	0	0
Software License	55,000	0	0	0	0
Labor (internal)	100,000	0	0	0	0
Consultants(external)	80,000	0	0	0	0
Total Development Costs	265,000	0	0	0	0
Operations/Maintenance Costs					
Software Maintenance	2,000	25,000	26,500	28,100	29,800
Technical Support	28,000	50,000	53,000	56,200	59,600
Hardware Maintenance	1,000	5,000	5,000	5,000	5,000

	Year 1	Year 2	Year 3	Year 4	Year 5
Total Operational/Maintenance Costs	30,000	75,000	79,500	84,300	89,400
Total Costs	296,000	80,000	84,500	89,300	94,400
Benefits less Costs	(241,000)	70,000	65,500	60,700	55,600

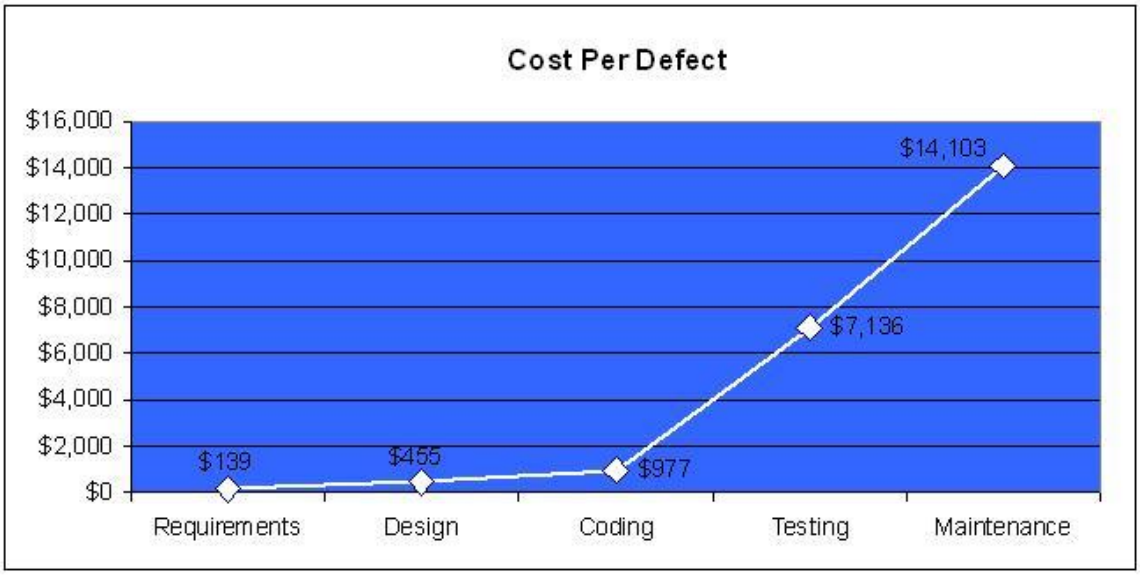
For future year estimates, you would use an agreed percentage rate of growth that you would likely get from your finance department. This would cover inflation, expected business improvements, etc. In the above analysis, a 6% growth rate was used for the operations/maintenance costs in years two through five.

This may sound like a challenging task, but it is by no means impossible. The best bet is to work with people who have the specific knowledge of these costs and benefits from experience with similar projects. The IT department should have the hardware, software and developer costs, while the accounting department should be able to provide information on revenue, profit, employee salaries, etc. Often this kind of information is also available in the organization from individuals who worked on a similar project recently or from consultants or industry groups

that have collected this information from other project teams.

Total Cost of Ownership

Often organizations don't spend enough time and money during the development phase to properly design systems. Or they don't understand or consider all the costs to maintain and support the new system and as a result make poor investment decisions.



Capers Jones, *Software Assessments, Benchmarks, and Best Practices*, Addison-Wesley, 2000

Unfortunately this can be a costly mistake. 80% of the cost of a new system will occur after it is put into use. Problems that are created during the analysis phase and caught before the implementation phase often only add a few hundred or few thousand dollars to the cost of the project. These same defects not caught until after the system is put into operation might cost hundreds of thousands to millions of dollars to correct.

If you look back at your cost benefit analysis, you will notice that your development costs are $265,000 and your operations/maintenance costs are $358,200. Based on the typical cost distribution, your numbers just don't add up. Either you are doing a perfect job and get all the requirements right the first time, or you have underestimated your on-going operations and maintenance costs.

You should be able to catch any omissions by showing your analysis to professionals in the IT department, other experienced people in your organization or to outside consultants. One reason that your numbers don't add up is that you haven't looked at the system's cost over its entire useful life. If you assume the useful life is ten

years, your total on-going costs would be approximately $1,100,000, which is almost exactly 80% of the total system costs.

By considering total cost of ownership, an organization looks at the big picture costs and benefits for a system over its entire useful life. These costs and benefits are similar to what is included in the cost-benefit analysis. The difference is these costs and benefits are estimated for the entire useful life of the new system. This is important because, you may find that over time your costs increase with inflation, but your benefits don't, as in the example. Or your benefits are only realized for the first five years, while costs continue to be incurred beyond this timeframe. By looking at the system's useful life, you may find out that this isn't as good an investment as you first thought.

For example, many organizations have started to question the practice of putting a personal computer (PC) on every desktop. One of the primary reasons is because of the high total cost of ownership of PCs. Although their prices continue to drop and a very good PC can now be purchased for less than $1,000, the cost of installing all the

software, updating the software and hardware, providing maintenance and support for the hardware, software and users can often cost more than $6,000 per year per PC. For a company with a thousand employees the total cost of ownership can easily be $6,000,000 per year just for personal computers.

So by considering total cost of ownership up front, organizations can make better business decisions.

Cash Flow Analysis

Up to this point you have determined how much you think a new system will cost over its useful life and how much benefit you should receive from it. What you haven't determined is how much cash each of these projects will consume every year. Organizations require a certain amount of cash to use for salaries, raw materials, project expenses, interest, dividends, taxes, etc. They calculate this as part of their yearly cash flow analysis for the entire organization. In order to determine their cash needs, every part of the organization must provide information to the finance department regarding how much cash they plan on using. Without this information the organization may not have enough cash to cover its

commitments and may have to borrow money at a high rate, get into trouble with its creditors for late payments or worse yet default on some payments. Conversely they may have too much cash available because of historically poor planning, which probably means the company is not getting the best return on its investments.

In order to determine cash flow, the analyst would start with the cost-benefit analysis. For each cost incurred, the analyst must determine when cash will actually be used. For instance it may cost $80,000 for some external consulting expertise, but your agreement with them is to pay 50% at the beginning of the project and 50% at the successful completion of the project. So for a project that will take 9 months and starts in September, you would record a $40,000 cash outlay in September and another $40,000 outlay in May of the following year.

In the earlier example, you would have had the following cash flows for each of the five years being analyzed

Bodies of Steel Self-Service Initiative Cash Flow Analysis as of 3-30-XX

	Year 1	Year 2	Year 3	Year 4	Year 5
Benefits					
Tangible					
Salary Cost Reduction	10,000	30,000	30,000	30,000	30,000
Increased Memberships due to higher facility utilization	25,000	60,000	60,000	60,000	60,000
Intangible					
Fewer Customer Complaints	10,000	30,000	35,000	40,000	45,000
Employee Retention	10,000	30,000	30,000	30,000	30,000
Total Benefits (sources of cash)	55,000	150,000	155,000	160,000	165,000
Development Costs					
Servers	(15,000)	(15,000)	0	0	0
Software License	(25,000)	(30,000)	0	0	0
Labor	(90,000)	(10,000)	0	0	0
Consultants	(40,000)	(40,000)	0	0	0
Total Development Costs	(170,000)	(95,000)	0	0	0
Operations/Maintenance Costs					
Software Maintenance	(2,000)	(25,000)	(26,500)	(28,100)	(29,800)
Technical Support	(28,000)	(50,000)	(53,000)	(56,200)	(59,600)
Total Operational/Maintenance Costs	(30,000)	(75,000)	(79,500)	(84,300)	(89,400)

	Year 1	Year 2	Year 3	Year 4	Year 5
Total Costs (uses of cash)	(200,000)	(170,000)	(79,500)	(84,300)	(89,400)
Benefits less Costs	(145,000)	(20,000)	70,500	65,700	60,600

Although the final difference between costs and benefits is the same as in your cost-benefit analysis, this analysis shows you how much cash you will need in the first several years to fund the project and how much cash the project is projected to save in subsequent years.

Payback Method in Years

It is common for companies to want to know how long it will take them to recoup their original investment. In fact many companies will not make investments unless it can be shown that their payback period will be less than some predetermined number of years or even months. They will also use this method to compare investments to one another for decision-making purposes. It is fairly common for the required payback period to be four years or less. It is also not unusual for an investment to have less than a one year payback period. Of course there's a better chance that these kinds of projects would get funded first.

The payback period is calculated by dividing the original development cost by the difference between average annual ongoing benefits and average annual ongoing costs.

Payback period in years = original development cost / (average benefit per year–average annual cost per year)

So for the Bodies of Steel Self-Service example above, you would need four years for the investment to be paid back. Your initial investment was 265,000; your average annual benefits for the five years is $137,000; and your average annual costs are $71,600. So you would divide $265,000/ by ($137,000-$71,600)= 4.05 years.

Net Present Value

Net present value (NPV) indicates whether or not the anticipated cash flows will provide the desired rate of return in current monetary terms. Projects incur costs and receive benefits over some period of time, which is often different for each project. Without discounting all future cash inflows and outflows to today's $ value, you can't reasonably compare projects or even be sure that individual projects will be profitable over the long term. (a dollar

today is not worth a dollar tomorrow due to inflation and other factors)

To determine the net present value, determine the cash inflows and outflows (this has been done in your cash flow analysis) and the discount rate, which is the minimum acceptable annual rate of return for the organization (this should be provided by the finance department). The discount rate is also referred to as the hurdle rate or opportunity cost of capital. Most organizations use a rate based on the return they could expect to receive elsewhere for an investment of similar risk.

If the resulting NPV is negative the actual rate of return is less than expected. If NPV is zero the actual return is equal to the desired return (which is also the Internal Rate of Return IRR). If NPV is positive, the actual return is greater than expected. The greater the NPV, the greater the rate of return on investment (Most calculators today have a built in function to calculate NPV).

You can also use this information in the following formula:

$NPV = \Sigma[A/(1+r)^t]$ where t equals the year of the cash flows, A is the amount of cash flow each year (t) and r is the discount rate.

Another way to calculate the net present value is by calculating the yearly discount rate and applying it to the costs and benefits for each year, then sum the discounted costs and benefits to get the projects net present value for all years.

Year 1: discount factor = $(1/(1+0.10))^1 = 0.91$

Year 2: discount factor = $(1/(1+0.10))^2 = 0.83$

Year 3: discount factor = $(1/(1+0.10))^3 = 0.75$

Year 4: discount factor = $(1/(1+0.10))^4 = 0.68$

Year 5: discount factor = $(1/(1+0.10))^5 = 0.62$

So for the example the discounted costs and benefits are as follows:

Bodies of Steel Self-Service NPV Cash Flow Analysis as of 3-30-XX

	Year 1	Year 2	Year 3	Year 4	Year 5
Benefits					
Tangible					
Salary Cost Reduction	10,000	30,000	30,000	30,000	30,000
Increased Memberships due to higher facility utilization	25,000	60,000	60,000	60,000	60,000
Intangible					
Fewer Customer Complaints	10,000	30,000	35,000	40,000	45,000
Employee Retention	10,000	30,000	30,000	30,000	30,000
Total Benefits (sources of cash)	55,000	150,000	155,000	160,000	165,000
Discount Factor	0.91	0.83	0.75	0.68	0.62
Discounted Benefits	50,100	124,500	116,300	108,800	102,300
Development Costs					
Servers	(15,000)	(15,000)	0	0	0
Software License	(25,000)	(30,000)	0	0	0
Labor	(90,000)	(10,000)	0	0	0
Consultants	(40,000)	(40,000)	0	0	0
Total Development Costs	(170,000)	(95,000)	0	0	0
Operations/Maintenance Costs					
Software Maintenance	(2,000)	(25,000)	(26,500)	(28,100)	(29,800)

	Year 1	Year 2	Year 3	Year 4	Year 5
Technical Support	(28,000)	(50,000)	(53,000)	(56,200)	(59,600)
Total Operational/Maintenance Costs	(30,000)	(75,000)	(79,500)	(84,300)	(89,400)
Total Costs (uses of cash)	(200,000)	(170,000)	(79,500)	(84,300)	(89,400)
NPV Total Costs	(182,000)	(141,100)	(59,600)	(57,300)	(55,400)
Total NPV Benefits less Costs	(127,000)	(16,600)	56,700	51,500	46,900

So your project would in fact lose ($11,500) in NPV dollars vs. a $31,800 gain from your cost-benefit analysis and your cash flow analysis.

Return on Investment (ROI)

This method measures the amount of money an organization receives in return for the money spent on the project. Take the total NPV benefits less the total NPV costs divided by the total NPV costs. The higher the ROI is the better the investment.

So for the example, you would take ($502,000-495,400)/$495,400= .013% return. Certainly this is a poor return on your investment.

So far a number of methods have been described for determining a projects financial benefits. Because you can't invest in all projects, you can use one or all of these methods to compare them to each other. But because some projects might have a useful life of only a few years and others ten years or more, you must put your cost and benefit estimates in terms of present value in order to make a fair comparison.

Internal Rate of Return (IRR)

The internal rate of return is the discount rate that makes the net present value equal to zero. This is the expected rate of return.

So your formula would look as follows:

$\Sigma[A/(1+IRR)^t]= 0$ where *t* equals the year of the cash flows, *A* is the amount of cash flow each year *(t)* and *IRR* is the discount rate.

So for the cash flow analysis where you calculated the NPV for the project to be (11,500) using a discount rate of 10%, you would need to adjust the discount rate so that the

NPV is equal to zero. Using the above formula and solving for IRR you determine that your IRR is 6.47%.

Most financial calculators have an IRR function.

Summary of Financial Models

Financial Model	Results Expected
Cost-Benefit Analysis	Comparison of all system costs to all system benefits over some predetermined time period, which is usually three to five years.
Total Cost of Ownership	Comparison of all system costs and benefits over the expected life of the system. By looking at the whole life of a system, you might find that either costs or benefits change materially in future years putting the investment return at risk.
Cash Flow Analysis	Comparison of all system costs and benefits showing when cash will actually be used. Organizations need to know how much and when they will need cash for planning purposes.
Payback	The length of time it will take for a system

Method in Years	to break even. The time period in which all costs will be recovered.
Net Present Value	Translating all costs and benefits from the cash flow analysis into current dollars. This allows systems with different expected lives and other potential investments to be compared to one another.
Return on Investment	The total amount of money an organization can expect to receive in net present value dollars for the investment they plan to make.
Internal Rate of Return	The discount rate used in the net present value calculation that makes the net present value equal to zero or in other words the expected rate of return.

What a project cost estimate isn't:

A project cost estimate is the project team's best guess at what it will cost to achieve the project objectives. This includes both the people and equipment resources needed to accomplish these tasks and the amount of time to do this work. Because these are estimates, some work will cost more than estimated and other work will cost less to complete. The project manager must be able to understand

the big picture and manage these changes as they occur during the project, in order to understand how the overall cost estimate is being impacted.

How do you know when you are done?

You are not done until the project is over and the customer has signed-off on the final deliverable. Until then, you will be comparing actual costs to budgeted costs to make sure you are on-track to deliver what you promised within the project baseline. As with any project, you will be asked to make changes; each of these change requests must be compared against the project budget to determine its impact, and if it is or out of scope. If it is out of scope, it must be reviewed by the appropriate person with authority to approve changes and the project baseline must be updated with these new costs.

d. Building Synergistic Teams

Introduction:

Usually it is the project manager who is responsible for bringing this unique group of people together to solve a difficult organizational problem. It is also the project manager's responsibility to help the group do great work in a supportive environment. You often hear people say the best managers get out of the way. What this means is that these managers know that they don't individually have the best solution. Otherwise why bring a team together? A good manager utilizes the different strengths of individual team members to create a cohesive team. She supports the team by promoting communication, an open forum for ideas, and a supportive work environment. When two or more people *work together* to solve a problem, a phenomenon called "synergy" is created, where 2+2 > 4.

Individuals always come into groups with their own ideas and assumptions. If the group solution is simply one persistent member's ideas, then chances are the team wasn't effectively utilized. Individuals should work cooperatively by being open to other opinions and methods. In this way, the team can develop an innovative solution, which should be superior to any individual team member's

ideas. Stephen Covey, *Seven Habits of Highly Successful People*

The chance for synergy is greatest when project team members don't see things in the same way. "Strength lies in differences, not in similarities." Steven Covey. We must respect and appreciate these differences so we can learn what they show us. Strive to work with people who don't think like you do.

How do you create a synergistic team?

There are many ways you can help your team work well together. Here are a few examples.

- Start out by understanding how team members are similar and different from one another using a tool like the Myers-Briggs Type Indicator.
- Establish a recognition system that rewards both individual and team accomplishments. Be careful to only reward people for achieving or exceeding project goals, not for working overtime due to poor project planning on their part.
- Open and continuous communications is key.
- Assume the best about people. It's easy to focus on what we think is the worst about people when we must work with

them day in and day out for months at a time. Put on the rose colored glasses occasionally and see what is best in them.

- Get together socially periodically to celebrate project successes.
- Encourage team members to be supportive of one another.

"What sets apart high performance teams is the degree of commitment, particularly how deeply committed the team members are to one another." John R. Katzenbach The Wisdom of Teams

Once you have identified the work that needs to be done to solve the problem identified (see 3b. Project Schedule), you can begin to identify specific skills, time requirements and a list of potential individuals that fit these criteria.

You can use a tool called a skills matrix described below to organize this information. First identify all the unique skills you will need on your project team and make each one a column heading. These would be things like project management, database skills, process expertise, industry expertise, programming skills, etc. Then identify

potential candidates to fill these positions, including their level of expertise in each area and how much time they have available to spend on the project. You will notice that usually you don't have a long list of candidates to choose from and that you will have to make some compromises because organizations are resource constrained. Consider pulling team members that aren't just the A players, but are the ones most interested in working on the project.

Skills Matrix

Team Member/Time Available	**Fitness Industry (Need one quarter-time Expert)**	**Operations Improvement (Need one full-time expert)**	**Oracle Database (Need one half-time expert)**	**Self-Service Registration Process (Need one full-time expert and one half-time acquired)**	**Web Development (Need one full-time expert one half-time Acquired)**
John Available: 100%	E	LE	NE	E	LE
Ekaterina Available: 50% now and 100% in one month	A	E	NE	NE	NE
Matt Available: 50%	NE	A	E	NE	NE
Mary Available: 75%	E	A	NE	A	LE
Henry Available: 100%	NE	LE	NE	LE	A
Yolanda Available: 0% now and 100% in two months	LE	A	A	LE	E
Greg Available: 100%	LE	A	NE	A	NE
Kim Available: 50%	A	NE	NE	NE	NE

E= Expert A= Acquired LE= Limited Experience NE= No Experience

One of the first things you should notice is that not one of these individuals is an expert (someone who has done this type of work many times) in all areas where skills are required. Of course this is typical for most projects.

Another thing to note is that several people with specific expertise are only available part time. Ekaterina has only 50% now when he's needed 100%, but she can work full-time in one month. Mary the process owner and industry expert is only available 75% of the time but you need her full-time. Yolanda, the web development expert, is not available at all for the next two months. This is common for people with relevant skills; they are often in high demand in other parts of the organization.

So now you must determine which of these individuals you will put on your project team and how you will fill gaps in expertise and time requirements. Meet with each potential team member individually to discuss the project and what you expect their roles and responsibilities to be. Make sure they get the opportunity to share their desires and concerns with you during this meeting. You don't want anyone on your project that doesn't want to be there,

otherwise they are likely to leave or make the project environment more difficult for everyone else.

Several decisions are easy, John and Henry both fit the selection criteria, and you add them to your team. One thing you are concerned about though is you have heard that John is not a team player and that is why he has 100% availability even though he has strong process skills. You accept this risk, as there is no one else in the organization available to work on the project with his skills, but realize you will have to provide him with addition support and oversight throughout the course of the project. In my own experience, I have often found that people get this label when they have a habit of challenging team thinking or the sponsor's thinking. These types of people can often help the team find even better solutions to the problems at hand. I have brought these kinds of resources onto projects often, and have rarely been disappointed.

Ekaterina and Yolanda are not able to spend the amount of time needed on the project. You will need to get with the project sponsor and find out if they can be freed from their other responsibilities. (a key reason for needing

top management support) If this isn't possible you will need to look elsewhere either inside or outside of the organization for this expertise. Depending on what you find, you may decide to use Ekaterina and Yolanda on a part time basis. Henry has some of the skills needed but not all of them. He will need to attend training as soon as possible to fill in her skill gaps.

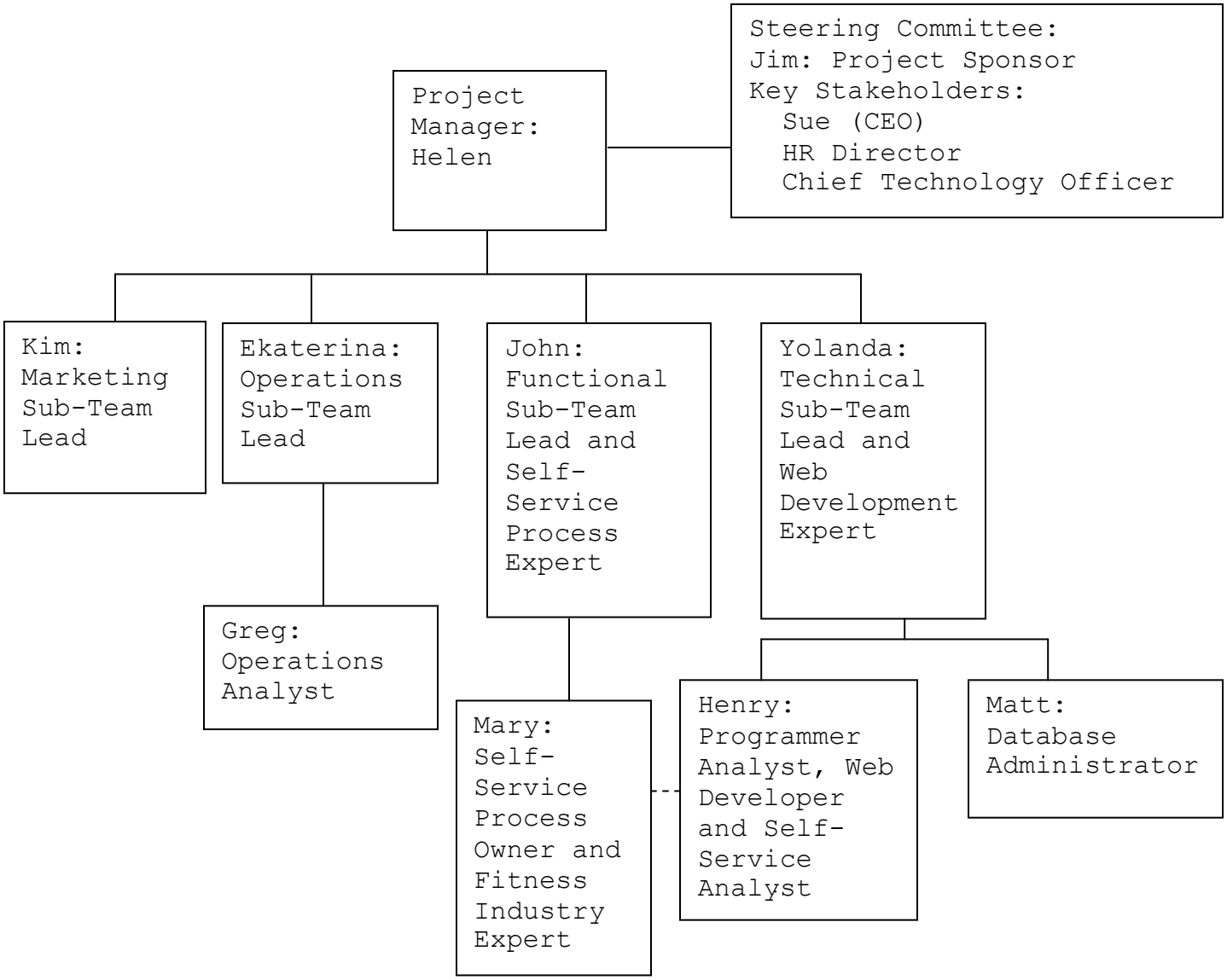
A good rule of thumb is to have resources devoted full-time to your project whenever possible. If you don't you probably can't control how they set their priorities since there is other competing work they are responsible for doing. The exception is specific expertise that is needed only part time and can be planned for and scheduled in advance. (e.g. Don's Oracle expertise)

Team Roles

A role defines the kind of work the individual will do on the project. For instance Project Sponsor, Project Manager, Functional Team Lead and Technical Team Lead are all common project roles. A good way to show the project team roles and lines of authority is to draw a picture of the project team using an organization chart like this one.

When reviewing the organization chart, you should notice that you were able to free up both Ekaterina and Yolanda to work full-time on the project. Mary is still part-time, but you decided that because of her knowledge of this area, having her work part-time on the project makes sense. She will be supported by John, who will take the full-time position for the self-service process.

Project Team Organization Chart



* Henry also reports to Mary working 50% of his time on the self-service process

Defining Responsibilities

By identifying project skills required, you have already begun to identify individual team member's responsibilities. The more clearly defined these are up

front the easier it will be to manage project team members expectations and to achieve project success.

Responsibilities are the tasks and deliverables the team member is to complete on the project. Some team members may share responsibilities. For this reason it is important to clearly define who is ultimately responsible for a particular task or deliverable being completed. It is the project manager's responsibility to clearly define team member responsibilities and discuss this with them before the project gets underway.

Responsibility Matrix

The responsibility matrix focuses on the project team. With each role on the project team come responsibilities. It is critical to identify and get agreement on team member responsibilities at the beginning of the project. By doing this it is less likely team members will duplicate one another's work and stakeholders will be clear about who to contact with project questions and information.
A sample responsibility matrix follows for our project:

Role:	Responsibilities:
Project Sponsor - Jim	• Approve project charter and provide project resources necessary to complete project as planned. • Review and comment on project requests within 3 business days of the request being made. • Help project team resolve any problems encountered during the project. • Communicate any changes in company strategy or focus that may impact the project in a timely manner.
Project Manager – Helen	• Develop and get approval on the project plan. • Communicate project issues to the project sponsor as soon as they are identified. • Communicate project status to the sponsor on a weekly basis. • Communicate project information as appropriate to the project team on a daily

Role:	**Responsibilities:**
	basis. • Provide support to the project team so they are clear about their responsibilities and make sure they have the resources they need to accomplish their tasks. • Maintain the project schedule, budget and other planning documents to be clear about actual project progress compared to budget.
Functional Team – John, Mary	• Develop functional requirements for new self-service registration system. • Develop system training materials. • Develop tests to verify system works as expected and test the system.
Technical Team – Yolanda, Henry, Matt	• Select system technology. • Implement working self-service registration system.
Operations Improvement Team – Ekaterina, Greg	• Analyze current and post system implementation non-

Role:	**Responsibilities:**
	peak facility utilization. • Analyze clerical costs pre and post implementation. • Make recommendations for increasing off-peak utilization.
Marketing Team - Kim	• Develop promotional materials and incentives. • Promote new system with members and staff prior to new system launch and post implementation.

Now you, your project team and stakeholders have a clear understanding of who is responsible for what on the project which will make it much easier for you to manage the project.

How do you know when you are done?

Just because you have staffed your project doesn't mean you are done building your team. Keeping the team on task and working well together requires constant care and nurturing by you the project manager. As certain phases of the project wrap-up you will assist you project team member in finding other interesting work, and you may lose some team

members to other projects, other companies, etc. During the course of the project you will have to fill these vacated roles on the team. So it's not just building, but also maintaining a synergistic team that will continue throughout the entire project.

e. Communications

Introduction:

According to the Merriam-Webster dictionary communication is: "a process by which information is exchanged between individuals through a common system of symbols, signs, or behavior." We all communicate every day both verbally and non-verbally. In fact ineffective communications is one of the top reasons projects get into trouble. A key to your success as a project manager is knowing whom you need to communicate with, in what form and how often. This information is the basis of your communications plan.

How Do You Communicate on a Project?

Communications can take many forms both formal and informal. Formal communications include project kick-off meeting, status reports, roles and responsibilities matrix, presentations, project deliverables, change requests, etc. Informal communications are just as important, if not more

important and typically occur more often. These might include dropping in on a project team member to see how things are going, a chance meeting in the hall with a project stakeholder who asks for a quick project update, etc. A key to effective communications in these situations is to do more listening than talking. Since communications includes both verbal and non-verbal elements (non-verbal makes up more than 50% of the communications signal), e-mail is not a very effective tool to use for communicating. Whenever possible it is better to meet face-to-face with the people you are communicating with. If this is not possible, or practical, meeting over the phone is better than via e-mail.

Communicating regularly with your project stakeholders is one of if not the most important things you can do as a project manager. It keeps you in touch with your team, it helps you surface issues earlier than if you wait until the regularly scheduled status meetings, and if you also use informal communications methods you often learn things that you might not have using formal channels.

There are many tools you can use to manage project communications; the two that I have found to be the most

effective and easiest to use are the stakeholder's analysis and a roles and responsibilities matrix. A stakeholder's analysis includes information about who we are communicating with, what needs to be communicated and how often.

Stakeholder Analysis

One of the first things a project sponsor and/or manager must do is a stakeholder analysis. These individuals will provide important information during the development stage and throughout the project. A stakeholder is anyone who will be affected by the project. It is important to conduct a stakeholder analysis to identify these individuals or groups including their name, organization, role on the project, level of interest, level of influence, unique facts, expectations (how they define success) and ways to manage their expectations. This information is important because it is these individuals who will identify the system requirements and provide project resources and support. If the team misses an important stakeholder or doesn't manage the stakeholders' expectations, these individuals could work against the project and keep it from achieving its objectives.

Stakeholder information is collected by interviewing the stakeholders. It may be sensitive and should be tightly controlled. At the same time it is vital so that the project team can understand and manage these key stakeholders expectations.

An example stakeholder analysis follows:

Name	**Organization**	**Role**	**Interest**	**Influence**	**Unique Facts**	**Expectations (success means?)**	**Ways to Manage Expectations**
Jim	Chief Operations Officer for Bodies of Steel	Project Sponsor	High	High	Very demanding likes to know the details. Expects to get this information verbally.	Jim sold this to management and his job is at stake if the project isn't successful. He expects the project will reduce payroll costs by 20% for customer service employees.	Currently Jim's objective of a 20% reduction in payroll costs for clerical staff is considered aggressive. Meet with Jim as soon as possible to discuss this and agree on how to best approach achieving this or making adjustments to it.

Name	**Organization**	**Role**	**Interest**	**Influence**	**Unique Facts**	**Expectations (success means?)**	**Ways to Manage Expectations**
Sue	Chief Executive Officer	Steering Committee	Medium	High	Not interested in details, just results and how this affects the bottom line	Not convinced this is a good investment, but is willing to let Jim take this risk. Of course if it doesn't work, Jim may lose his job. She expects that the project will reduce costs, but also hurt customer relationships and loyalty.	Make sure that the project objectives are clearly tied to improving customer relations. Get a quick win or two, which shows how customer relations will be improved by the new system. Show how the project team will also manage project costs and provide a good return on investment.
Clerical Staff	Customer Support	System Users	High	Low	Customer Support is mostly made up of people who have been around for a long time and have poor computer skills	Most of these people are very afraid of the new system. They think they may lose their jobs because the new system will replace them.	Get this group involved early in identifying system requirements while helping them to understand the project purpose and their role in the project. Make sure they receive sufficient training and are involved in all aspects of the project.

Customers	N/A	System Users	High	Medium	In general your customers are very sophisticated. Many are professionals with very little spare time. They want things to be easy and fast. They also expect things to work on the first try.	The customers aware of the new system are excited. They hate the current process and expect the new system will let them register for available facilities at their leisure. They also expect that like with the current system, the old timers will continue to get their court preferences.	Based on the customer's feedback, there are some incorrect expectations. When the registration process is automated it will be first come first serve and customers will not always get their court preferences merely the time and type of facility if they are available. It will be important to regularly communicate with stakeholders and hold several open houses to discuss project plans.
Don IT Manager	Information Technology	Steering Committee	Low	Low	Don is busy with several other initiatives that he believes are higher priority.	He is unfamiliar with the new technology being implemented but has heard from his friends at other companies that it doesn't work.	Get Don involved early. Try to demonstrate why this project is so important to the company. Get some quick technology wins to build his confidence in the new system and the project team.

Name	**Organization**	**Role**	**Interest**	**Influence**	**Unique Facts**	**Expectations (success means?)**	**Ways to Manage Expectations**
Mary	Customer Support	Process Owner	Medium	Medium	Mary designed the current process and forms. She doesn't see the need to change it and is afraid she may lose her power as a result of this project.	She doesn't know what to expect and is unclear about her role on the project team.	Get with Mary as soon as possible to discuss and address her concerns. Make sure she is clear about her role on the project team.
HR	Human Resources	Steering Committee and Human Resource Allocation	Low	Low	HR is too busy with many other more important initiatives	Unclear	Schedule a meeting with the head of HR to discuss the project and find out more about their needs and expectations.

It is common for the project manager(s) to schedule face-to-face meetings with key stakeholders at the beginning of the project. One of the most important things to get from these meetings is how the stakeholder defines project success (their expectations). This information can then be used to refine the project purpose and objectives. If for some reason the stakeholders' expectations are different than those of the project team, this is an opportunity to

communicate this and begin to manage these expectations. These will also need to be managed throughout the project, as stakeholder expectations often change over time. By including key stakeholders in regular status meetings and sending this type of information to other stakeholders as part of the project communications plan, the project manager can better manage these changing expectations.

Decision Making

A key to project success is having a defined timeframe in which decisions are made by management. It is common to require all project decisions be made within three business days of being presented to management. This is referred to as decision time boxing. If management doesn't decide within three business days, the team goes ahead with the recommended solution. In addition to time boxing, management should make sure the project team is clear about which decisions they can make on their own and which ones would require consulting management.

A simple table can be used to clarify this for the team:

TEAM EMPOWERED TO MAKE DECISION	**TEAM MUST CONSULT MANAGEMENT**
No change to project time or resource estimates	Change will require additional time and/or resources
No change to project objectives and/or measures	Change to project objectives, and/or measures
Change only effects processes, technology or departments within scope	Change will effect processes, technology and/or departments outside project scope

The project team discovered that current athletic facility usage is not being captured on a regular basis. For the project to be able to achieve its objectives, this information must be collected. Either the project team would have to develop a way to collect this information or the department responsible for this will need to start doing it more regularly.

The team realized they need to get management approval to collect this data since capturing facility usage would require additional time and resources to accomplish. Until this is decided no further work can be done on this part of

the project. Fortunately the team had already agreed with management how the team would make these decisions and who was empowered to make them. Based on this agreement, the team pulled together a presentation showing three different ways to solve this problem, including the pros and cons of each scenario and the team's recommendation. These were immediately sent to the decision makers via e-mail. A meeting was also requested at which time a decision would be made.

What a Communications Plan is not!

A communications plan is just that, a plan. It is not a substitute for getting out and talking to your stakeholders and project team members on a regular basis. You may remember the old saying written about by Tom Peters called "Manage by walking around." This is just as relevant today as it was back then; your communications plan simply supports you while you are out meeting with your team and project stakeholders.

How do you know when you are done?

You are done with communications at the end of the project and never before! This is an on-going process during which you will regularly communicate with your project

stakeholders and team members. On any project things are constantly evolving, you must keep yourself, your project stakeholders and team informed of these changes in a timely manner for your project to have a better chance of achieving its objectives.

f. Risk Management

Introduction:

A risk is simply something that can go wrong (and something usually does on projects), that keeps you from achieving project success. Of course there are things that can occur that are positive, which can also be referred to as risks. We will focus on those risks that have a potential negative impact on your project. Risk management is a discipline that allows you to increase your chances of success by planning how to identify and reduce the likelihood of risks occurring; risk management also helps you identify how to minimize the consequences of the risk if they do occur– in spite of your planning efforts.

How is it created?

Risks fall into three categories on a project: scope, resource and schedule. In the categories of scope and resource risks, innovation is a major risk factor. Any time

the project team, the organization or the external stakeholder ventures into unknown terrain or looks to make a significant change to how things are currently being done, the risk factors multiply. The less experience you have with a certain type of application or technology and the more change you try to make to an organization, the likelier you are to run into trouble.

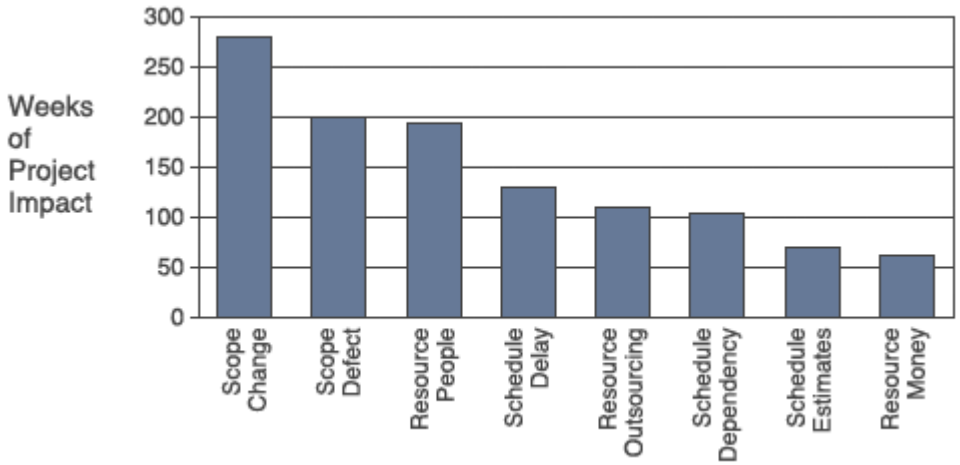
The second most likely set of risk factors is associated with complexity. Complexity introduces relationships among parts of the project, so that there are more dependencies. If something goes wrong in one area, it is more likely to affect some other area. Complexity also often increases project size, since there are more things to be done. And sheer size is a risk factor, because the difficulty of communicating among team members and with stakeholder grows geometrically. Finally, complexity is often associated with lack of experience. Just as, according to Tolstoy, all happy families are alike, but each unhappy family is unhappy in its own particular way, so all simple systems resemble each other, but each complex system is complex in its own unique way. And lack of experience has the same consequences as innovations.

Finally, there are risks that do not vary much from project to project: a fire destroying the developers' workspace; a key team member is injured and hospitalized; the company is taken over and the new management must be brought up to date before the project is allowed to continue; the sponsor or the organization's management is indecisive and stakeholders keep changing their minds...

As project manager, you are responsible for identifying the context of your project and the various risk factors that apply. Use brainstorming sessions, speak with other project managers who have experience with the same kind of system, refer to the available literature on the Internet, in particular from the Project Management Institute. Once you have identified the risks, sort them by probability of occurrence – the malfunction of a brand-new software development tool is likelier than a tsunami in, say, Colorado – and by magnitude of consequence – a risk that would cost you a few hours of work is not nearly as critical as one that would immobilize the whole team for three weeks.

The following figure by Tom Kendrick's Failure-Proof Projects, shows the most common project risks, based on a

study of several hundred projects. The risks are mainly in the area of communications (often, but not always, due to size) and commitment. Most of the projects studied were fairly routine – not very innovative, not very complex, not very large. In fact, run-of-the-mill projects are the rule; ambitious ones are the exception. The overall risk on ambitious projects is higher, and also the impact when something goes wrong.



The above chart (from Failure-Proof Projects by Tom Kendrick) further characterizes risks based on scope, schedule and resources (triple constraint) by their root cause. For the above data scope risk caused nearly 500 weeks of project delay, resource risk more than 350 weeks and schedule risk just over 300 weeks of delay for the projects reviewed.

Once you have identified and assessed the risks on your project, you can start planning how to address them. There are two things you can do to improve the situation: *risk*

reduction, decreasing the probability of a risk materializing, and *risk mitigation*, decreasing its consequences, should it materialize.

Risk Reduction

To reduce risks, you can use several approaches:

- Create an awareness of the risk among your team members and the project stakeholders: "forewarned is forearmed." For example, you might point out that computers do crash and that it is prudent to save your work from time to time when you are engaged in a long-lasting task.
- Create a specific process to reduce risk. For instance, you may have found in the past that there is a risk of system testing being incomplete (causing defects to slip through) unless you include user representatives in test planning. You would then, as a minimum, require sign-off by a user before the test plan is declared complete.
- Invest resources in risk prevention. For instance, you could have the organization install fire extinguishers. A more relevant example is to install a good computer backup system, which will reduce the risk of losing completed work and also reduce the risks associated with system modifications.

Risk Mitigation

Risk mitigation is how you plan to minimize the impact if any of the risk factors that you have identified should materialize. You will never be able to reduce the risks to a point where it is guaranteed that nothing wrong will happen: at some time, some risk will materialize. (This is popularly known as “Murphy’s Law.”

The two main approaches to risk mitigation are early detection – finding out that an incident has happened before the consequences have had time to spread – and contingency planning. Contingency planning consists in figuring out beforehand how to handle a crisis and setting apart resources to deal with it. For example, you might have a succession plan for key personnel, so that if someone falls sick, you can quickly get a replacement (for example, from a temporary work agency). In all cases, you need to set aside a contingency in both the project budget and the schedule. The contingency does not need to cover the sum of all possible risks, since only a small number of risks are likely to materialize. The most important thing about the contingency is that it is a reserve for the entire project based on the likelihood and impact of the risks identified, not a reserve that you build into each

individual activity. If you did, you would soon find that team members would treat the contingency as an addition to the estimated time to complete the task, and they would therefore gradually consume the whole contingency without any risk actually having occurred.

Of course, if the consequences of a risk happening are so minor that they won't affect cost, schedule, scope or quality, you can remove the risk from your risk management plan.

Risk Management Plan

A risk management plan consolidates in a single document all of the work of identifying, reducing and mitigating risks. The list below was developed for our sample project and represents a typical example of risks on a fairly small project to implement a new system.

Risk Management Plan

Risk/Cause	Likelihood	Impact	How to Minimize Cause	Current Status	Action Items	Responsible Person
SCOPE						
Key Requirements are identified after the design freeze due to lack of involvement of users	H	H	Perform a Stakeholder analysis to identify key stakeholders. Develop a communications plan to keep them involved in the project. Identify process owners and make them responsible for delivering value	A key process owner has been identified who is not interested in participating in the project.	Include this in the next status meeting with the project sponsor and other stakeholders. Brainstorm ways to get this individual involved.	Project manager
Requirements keep changing because no clear project objectives were identified up front	H	H	Keep team focused on key project objectives (80/20 rule) Use iterative prototyping approach and involve all key users in the process. Get sign-off on requirements and enforce no going back.	Have had to enforce no going back to change things that were already decided. Team needs to be periodically reminded of areas of focus (value) 80/20 rule	Need to get process owners to sign-off on second iteration prototype	Project Manager

Risk/Cause	Likelihood	Impact	How to Minimize Cause	Current Status	Action Items	Responsible Person
Stakeholders' expectations are different than project teams due to lack of clear on-going communications	H	H	Stay in constant communications with stakeholders to first understand their expectations and then work to help them understand the project teams	Currently one key stakeholder is not willing to participate in the project.	If this isn't resolved within the next week, escalate to the project champion.	Project Manager
RESOURCE						
Key resources dedicated to the project don't materialize due to other higher priority projects	M	H	Make sure to have a project champion who can help free up these resources	A key process owner is not participating as planned	Generate interest in the project through some quick wins to get people more involved.	Project Champion
Project Champion leaves the organization before the project is completed	M	H	Keep project duration as short as possible, check with Champion up front regarding his/her commitment to the organization, have a second champion available in case of worst case scenario	Champion is committed to the project,	Identify a second champion and get this individual involved in the project	Project manager

Risk/Cause	Likelihood	Impact	How to Minimize Cause	Current Status	Action Items	Responsible Person
Process owners not involved due to lack of time	M	H	Work with the project champion to either free up these resources or identify others	Currently one process owner is unable to participate as planned	Identify this issue in the next status meeting for resolution.	Project manager
Resources assigned to the project are inexperienced	M	M	IF experienced resources are unavailable internally, use outside experts to make sure project has the appropriate skills	Currently the project is missing technical and functional resources familiar with the new software being implemented	Raise this issue in the next status meeting. Schedule additional training for the project team members. In addition these outside resources and training will cost more than what the project has currently budgeted	Project Manager
SCHEDULE						
Project time requirement underestimated due to poor planning	M	H	Stop and take the time necessary to make sure time estimates are reasonable.	The project is getting behind one day each week due to the time requirement being underestimated	Check with other organizations and experts and determine a more accurate time estimate	Project Manager Technical Lead Process Lead

Risk/Cause	Likelihood	Impact	How to Minimize Cause	Current Status	Action Items	Responsible Person
Project completion date conflicts with several other large project completion dates	L	M	Change at least one of the projects completion dates	So far management is unwilling to change the project's completion date so the system will be ready for the busy fall season	Escalate to project champion to see if the other two projects completion dates can be changed	Project Champion
Decisions are not being made in a timely manner due to lack of decision making process	H	H	Develop and get agreement to a decision making process with a no going back rule after a decision has been made	Project has lost one week already due to slow decision making	Present the decision making process in the next status meeting for approval	Project Manager
Technical						
This Technology has never been used in the organization before	H	H	Bring in outside expertise familiar with the technology	Currently searching for internal or external expertise with the software	Identify external resources and organizations that have experience with this technology	Project Manager Technical Lead

Risk/Cause	Likelihood	Impact	How to Minimize Cause	Current Status	Action Items	Responsible Person
Project depends on the network being upgraded before it can work	L	H	Get IT management responsible for the network involved in the project.	Currently no regular contact with IT network management regarding the project status	Meet with IT management to understand their expectations and explain the project's needs to them. Get the appropriate networking manager involved in regular status meetings	Project Manager
IT professionals will not join the project until after the requirements have been finalized	M	H	Get appropriate IT personnel on the project team at the beginning of the project	No IT professionals with necessary skills are available for at least two months	Raise this issue in the next status meeting. Make sure IT management responsible for these resources are in attendance. If not resolved, escalate to project champion	Project Manager

What it is not:

A risk management plan is not a substitute for project planning or lack thereof. Before you can develop a quality risk management plan, you must be very clear about your project purpose and objectives, what is in and out of scope, what resources are available to you and when you have to deliver the project to your stakeholders. Without this information you cannot begin to understand what may or may not go wrong and what impact it might have on your project.

How do you know when you are done?

Now that you have developed this risk management plan, you must keep it updated throughout the project's lifespan. This includes monitoring the risks you have already identified, reassessing their probability and their potential consequences, and adding new risks as you discover them. The project manager is usually responsible for handling this task throughout the life of the project.

8. Project Execution and Controlling

a. Project Meetings and Status Reporting

Introduction:

Meetings, whether of the whole team or only a part of it, are held to bring team members face to face, to make sure everyone is working towards the same objectives, to check in and find out how people are doing, to share information and new knowledge, to coordinate activities, to discuss issues and to make decisions.

On the other hand, meetings can be time-consuming and they can disrupt the day for people who need to prepare deliverables according to a project schedule. Unless they are properly planned, there is also a risk that meetings will not achieve any meaningful purpose. A good guideline is that if the team is spending more than 30% of its time in meetings it is probably not being as productive as it could be.

How are effective meetings prepared for and conducted?

Define the Meeting Purpose in Advance

Before a meeting is even scheduled, decide its purpose. Given the project objectives the team is working on, question how this meeting will help the team get closer to accomplishing one or more of them. Make clear what outcome

you expect: gather information, make a decision, solve a problem, or to share information.

Who Should Attend the Meeting?

You can reduce the total time spent in meetings—and avoid some frustrations—by inviting only those individuals necessary to achieve the stated purpose should attend. Other team members can find out about the meeting from the meeting notes which are kept by the meeting recorder (see meeting roles below). Who to invite should be clear from the definition of roles and responsibilities for the project.

Creating the Meeting Agenda

The meeting leader should circulate a proposed agenda and send it to all participants for review and comments well before the meeting. In this way, participants can have the agenda clarified and expanded to address their particular concerns. This encourages active participation—a prerequisite for successful meetings. Two business days ahead of time is usually enough notice, unless the team charter specifies otherwise.

The agenda should cover the meeting purpose, the meeting start and end times, a list of topics in sequence by

priority, the process the team will use to cover the topic, the person who will present each topic, how much time is allotted to discuss each topic, and any preparatory reading or other activities for the participants.

University Athletics Meeting Agenda

Meeting Purpose: Introduce Leeds Project Team

Date: 2/12/2XXX

Location: Client Offices in Broomfield

Time: 2 pm to 3 pm

Agenda:

- Team introductions (Major, work experience and interests) - 5 minutes
- Client introductions (Title, project interest and project role) - 5 minutes
- Project background - 5 minutes
- Project objectives - 10 minutes
- Project scope - 10 minutes
- Project deliverables and due dates – 15 minutes
- Next steps – 10 minutes

Meeting Ground Rules

Meeting participants should agree on how the team will work together during meeting time. Everyone is spending their valuable time there, so meeting ground rules help make sure it is as productive as possible for them. Establish or review ground rules at the beginning of every team meeting. Consider some of the following things while formulating ground rules:

- how should interruptions be handled?
- should the team assign roles and keep them the same for each meeting or rotate them?
- how will decisions be made? (See decision-making above)
- how will the team deal with violations of the ground rules?

Meeting Ground Rules at University Athletics

1. Be on time,
2. Turn off all cell phones and pagers,
3. Consider ideas from everyone,
4. Be open to constructive feedback,
5. Listen to the person speaking to make sure you clearly understand them,

6. Actively participate without dominating. Do this by actively listening, asking for other's opinions and consider all opinions as valid,
7. Adhere to the decision-making process agreed to as a team. If the team cannot make a decision within the allotted time period, the meeting leader will make the decision for the team,
8. Stay focused on the topic being discussed,
9. If time allotted for the discussion expires or someone wanders off topic the timekeeper should interrupt the person to get the meeting back on track,
10. Violations of ground rules will result in one of the following:
    a. Team member will bring the food to the next meeting, or
    b. Team member will act as the meeting recorder for the next meeting.

Meeting Roles

By establishing meeting roles, the team will find meetings are more productive and more time efficient. Before the meeting starts, make sure each team member clearly understands his role and responsibility during the meeting.

Roles typically include:

- Meeting Leader – the meeting leader can be anyone on the team. This individual creates the meeting agenda and solicits feedback prior to the meeting. The meeting leader leads the meeting, in particular the opening (agenda and ground rules), transitions from one topic to the next, and closing (action items). Finally the leader can capture key information on the whiteboard or flip chart during the meeting for all the participants to see. (This can also be done by the meeting recorder or by another participant—preferably one who is not too deeply involved with the issues under discussion.)
- Meeting Recorder – this individual captures the detailed meeting discussion, including for each topic the main points discussed, decisions made and action items. More material can be included if required.
- Timekeeper – This individual helps keep the discussion focused on the topic or task scheduled, while providing warnings as time is running out. The time keeper's job is to help make sure the meeting does not go over the time scheduled and stays focused on the agenda items.
- Team Members – each team member's responsibility is to come to the meetings prepared, by completing his

assignments and participate in the discussion by sharing his knowledge and expertise.

The Meeting Process

Post the meeting agenda and ground rules on a board at the beginning of the meeting. During the meeting, the topic or task leader should capture and post key information on flip charts or whiteboards that are clearly visible to the participants. This will help the team stay focused on the topic or task being discussed. Occasionally topics or tasks will come up that the team can cover at another time; these items should be posted in a "parking lot" so they are not lost and can be discussed later. At the conclusion of the meeting, the team leader creates a list of action items from the discussion, including due dates and responsibilities for each item. This information is used by the project manager to update the project work plan.

When capturing key information the team leader should write in large letters, leave a margin on both sides of the paper, note only the key words, make sure everyone can see the board, alternate colors with each new point and use pictures, underlining or capital letters to highlight key points.

A Special Kind of Meeting: Status Reporting

As work on the project goes forward, you must monitor its progress against the project schedule. The project team should get together at least once each week to review project status. Prior to these meetings, the project administrator updates the project schedule with work completed since the last update. Team members also produces a weekly individual status report, which summarizes the work they have completed, issues they need assistance to resolve and work they plan to finish before the next status meeting.

The progress report must be consistent with the project schedule so that it is easy to understand which portions of the plan have been completed and which remain to be done. The focus should be on deliverables, not tasks.

A frequent problem is that team members will indicate that a task has been completed, but then continue to work on the task. Thus, although it is marked as 100% complete in the project schedule, it is in fact not done. Not only does the project manager get wrong information about how the project is progressing, but other project members, seeing that an item is reported complete, may rely on its content (which in reality is not yet ready). As a result their work may

have to be done over when the first task is really completed.

Here is an example: One team member is writing the user documentation for how to enter the customer reservation information. The team member indicates this work is done. A second team member responsible for developing the training materials for this process sees the status as done and begins to use this user documentation as the basis for the training material. A third team member responsible for creating on-line help for this function, sees the done status and begins to create the on-line help for this function. In fact the first team member wasn't done and additional changes are made to the user documentation. These changes affect all the work being done by the other team members who have to go back and make changes to their work.

To minimize the risk of this happening, the project manager must make it very clear to all team members what DONE means; project management must clearly communicate the importance of properly measuring the percent complete for tasks; tasks should be done on time, and finally, tasks should be signed off by the appropriate team lead as being done before the project schedule is updated with this status.

Monitoring project progress and controlling the project go hand in hand. Whenever a variation from the project plan is identified, project management must take corrective action to minimize any negative impact on the project schedule, budget and expected outcomes.

Functional Team

Status Report for period ending April 15, 20XX

Work completed since last period:

- Finished interviewing selected users regarding the self-service process and updated the requirements document
- Completed the second prototype for the registration process
- Completed the first prototype for the reservation process
- Scheduled a user review of both prototypes for next week

Planned but not Accomplished:

- Complete first prototype for the management reporting process

Issues requiring assistance:

- The registration process owner is not involved in the requirements definition process

- The reservation process team has had to work 30% more hours than scheduled due to lack of user involvement and lack of experience on the sub-team.
- The management reporting team is already one week behind schedule due to a shortage of team resources. The team doesn't see how to make up this lost time and will likely continue to fall behind unless something changes.

Work to be completed during the next period:

- Conduct the user reviews for the registration and reservation processes.
- Complete the first version of the management reporting prototype.
- Update the prototypes to reflect user comments.

Project stakeholders also must be kept informed of project status. For most projects the steering committee (where key project stakeholders are represented) meets monthly. For projects that are less than a few months in duration or during critical periods, it is usually better for this group to meet more often. Before the meeting, the project manager should distribute a progress report, usually in the form of a Gantt chart (see Figure 4.9 above), which is clear and intuitive while conveying enough information for

its purpose. An explanatory narrative is added to describe any issues that the steering committee needs to know about.

Collaborative Technologies to Support Team Work

In many organizations, teams may not be able to meet in person easily or cost-effectively. This is certainly true with software development where planning, analysis and design may be done in physical proximity to the customer and the actual development work done offshore in places such as India, China, or Russia. Not only are more and more developers working remotely, but they may be working in different time zones, making meetings difficult. Collaborative technologies can enable teams to share information 24 hours a day, seven days a week, wherever team members are located and whenever they are working. Collaborative technology is available today to support distributed team functions, including:

- team dynamics - group scheduling software, electronic meeting software and workflow automation software.
- repository management – storage and update of all project deliverables – documents, programs, data – by any authorized user.
- application development – configuration management software and issue tracking software.

b. Project Meeting Notes

Introduction:

Taking good meeting notes starts with having a productive meeting. In order for your meeting to be productive you must plan for it, just as you have been doing for your project. Meeting notes are used for a number of important purposes. First of all they can be read by anyone who could not attend the meeting but has in interest in the topic(s) discussed. Second they can be referred to later if someone has questions regarding the outcomes of the meeting; they also document any decisions made by the team to help minimize the problem of continually revisiting completed project work and finally they document any to-dos and due dates.

How are they created?

Meeting notes document the meeting purpose and objectives (why are you having the meeting and what do you hope to accomplish from it), agenda, date, attendees, summary of topics discussed, any decisions made, to-dos, who is responsible for completing these and by when. Prior to the meeting a note taker should be identified. This is a task that you should spread around the team during the course of the semester to give everyone a chance to do it. It is

also a good task to give to team members who missed the last meeting, didn't complete their assignments as expected, etc. This doesn't mean that note taking is not important, but it can be tedious and therefore can be used as a motivator.

One of the hardest things to do is get the level of detail right. You don't need to capture every word, but you do need to capture the essence of the discussion and in particular the decisions and to-dos.

Sample Project Meeting Notes:

Project Meeting Notes – Taken by Greg Avery

Meeting Purpose: Introduce Leeds Project Team

Date: 2/12/2XXX

Attendees:

John Lear, Chief Operating Officer - Client

Harry Jones, Business Analyst – Client

Kathy Martin, Operations Manager – Client

Yung Lee, Leeds School

Harriet Young, Leeds School

Greg Avery, Leeds School

Lori Mills, Leeds School

Topics Discussed (based on the meeting agenda):

1. Team introductions (Major, work experience and interests) Client introductions (Title, project interest and project role)

Each of the client and Leeds students introduced themselves. It was interesting to learn that our project is one of the company's top priorities for this year and therefore our team will be in the spotlight. We also learned that Jim Lear will act as our project sponsor for this project.

2. Project background

Jim explained that our project is focused on helping them reduce the cost of promoting their products to the college marketplace. Currently they spend more than $5 for each book they sell on campus. The average book sells for $57, so this is nearly 10% of their selling cost. They would like to get this closer to the industry average of 5% of total cost.

3. Project objectives

We discussed a number of different objectives for this project and still need to do some more work to finalize

these. Yung Lee will work with Harry Jones to get these drafted and to the team no later than 2-19-2XXX. They will also coordinate with Harriet and Kathy who are going to be defining project scope for the project.

4. Project scope

After discussing the project for some time, it was clear that the initial project scope was too large for our team to handle during one semester. It was determined that rather than trying to tackle this problem for all campuses where they sell books, the team will focus on CU Boulder, CSU and DU. Scope still needs to be finalized. Harriet Young will work with Kathy Martin to get this drafted and presented to the project team no later than 2-19-2XXX.

5. Project deliverables and due dates

Until the project objectives and scope are close to being finalized, we cannot determine what our project deliverables will be.

6. Next steps

a. It was determined during the meeting that the team needs to meet at least every week for one hour to make sure that the project stays on track. The next

meeting will be held on 2-19-2XXX to review progress and finalize a consistent day/time that works for everyone each week.

b. The client has a number of documents that will help the students better understand their business and what they have tried to do already to reduce marketing costs. Harry will post these to the project web site no later than end of business on 2-12-2XXX and the students will make sure to have read these prior to the next meeting on 2-19-2XXX.

These notes were sent to all project team members (several members were not in attendance). If you have any questions, comments or changes please contact Greg Avery at GAvery@BodiesOfSteel.com as soon as possible.

Communicating Meeting Results

To communicate the meeting results to the entire team, the recorder documents the meeting notes and sends them out to all meeting participants to solicit comments regarding missing items or misinterpretation. Once he has made the required changes, the recorder sends the updated minutes out to the appropriate stakeholders based on the communication plan.

What it isn't:

The meeting notes are just that notes. They are not a project deliverable; they do not replace any of the project planning documents like the charter, WBS, etc. They are the record of the meeting which is then used as the basis to create these other documents, while also providing the details to support the contents of your deliverables. Either way these are very important documents for the project team to create, keep and refer to throughout the project lifecycle.

How do you know when you are done?

You are not done with the meeting notes at the conclusion of the meeting. The note taker needs to take some time to review these notes for completeness, spelling and grammar errors. Finally, the note taker should send these notes to all of the attendees first for any comments/changes prior to sending them out to any other interested stakeholders.

c. Change Management

Introduction:

Change management is a systematic way to control changes to your project. As part of the project planning process, you developed a cost and schedule baseline based upon your

project plan. As work on the project progresses, it is not uncommon for stakeholders to ask you to make changes to your project, including: increased (or decreased) scope; shorter (or longer) schedule; decreased (or increased) cost; and reduced (or improved) quality. A change to any one of these will impact one or more of these other variables either positively or negatively.

Before any change is made, you the project manager must understand the impact of this change to your project scope, schedule, cost, and product quality. (See 8b. Triple Constraint) If this change impacts any of your project constraints, it's more than likely your project sponsor would have to agree to this change.

But before any decision can be made regarding a change to your project, the change request must be documented and analyzed against your project's triple constraints. The project manager would be responsible for doing this analysis and presenting it to the project sponsor.

What is it?

During project planning you work with management and your project team to define the project scope, schedule, cost

and quality; you develop a cost and schedule baseline based upon these. This baseline is what you think it will take to deliver the expected project deliverables in terms of time and resources. As the project progresses it is not uncommon to discover that your plan needs some adjustments or the stakeholders make change requests or both. If there is an adjustment or change request that impacts any one of the project's triple constraints, then at least one or more of the other constraints will also be affected. For example if management asks you to increase peak center utilization (this was out-of-scope in your original charter), you will either have to reduce the quality of your work in other areas to accommodate this, spend some additional money to bring in more resources (e.g. outside consultant) or spend more time to complete the project (this will also probably cost more money).

One of your most important responsibilities as project manager is to be aware of any changes to your project plan, and before these changes can be accepted, you must review them to determine what impact they will have on your project's triple constraint. You must also make it clear to all of your project team members that all change requests must go through you. For all changes, have the

stakeholder complete and sign a change request form for each change they are requesting (see an example at the end of this section). As soon as you hand them this piece of paper, they will probably argue that they are not requesting a change to the project plan, only providing more information to clarify what was already agreed. This is why having a well written project plan is so critical. Without it you will not be able to differentiate between what was agreed to and what is a change. Either way, don't let this pushback scare you off; if you do, you will most likely only see more change requests coming your way. Hold to your guns, and make the stakeholder go through the change control process. Once the stakeholder provides you with the documented change request, you can review it to determine if it is fact a change and its impact on the project. This is what you will present to your project sponsor for review and approval, clarification or rejection.

Another common mistake project managers make is to leave key stakeholders out of the planning process. If you did this, you will probably get change requests from them. Of course they will not perceive these as changes, since they were not involved in the initial planning. If you left a

key stakeholder out during planning, your ability to control changes to the project becomes more difficult. You must still go through the change management process, but will need more support from your sponsor to deal with these requests.

Sample Change Request Form:

	To be completed by the requestor
Change Request #	20XX_0032_005 (year, project id, change request id)
Date Received	03-23-20XX
Requestor Name/Dept	Sue Young/CEO
Change Description	Include peak center utilization in scope
Reason for Change	Customers are starting to complain more about how over-utilized the facility is during peak times. I am concerned that if this isn't addressed soon, some customers may defect to other gyms.
	To be completed by the project manager with input from the appropriate project team member
Stakeholders Impacted	Customers, Operations

	To be completed by the requestor
Scope Impact	This request will require the project team to analyze the peak facility utilization in addition to non-peak utilization. The team will also have to make recommendations for decreasing peak utilization and analyze the change in peak utilization at the conclusion of the project.
Schedule Impact	The work requested will require an additional 120-140 hours to complete and extend the project deadline past the start of the busy season.
Resource Impact	The resources with the skills to accomplish this work are already committed more than 100% to the project and their current job responsibilities. We would have to either take these resources off their current jobs, which is not realistic since there is no one to back-fill with or bring in an outside consultant to do this work.
Cost Impact	Assuming we would have to use a consultant, they charge an average of $100 per hour. So this change would cost the project an additional $12,000 to $14,000.
Quality Impact	By having a deeper understanding of peak utilization, the team could actually improve the quality of the project deliverables.

	To be completed by the requestor
Project Team Assessment	The best way to address this problem is by either expanding the facility (not realistic and absolutely out of scope) or to divert customers from peak to non-peak times. Since the team is already considering non-peak utilization and developing a marketing plan to promote non-peak usage, we feel that adding this scope will not enhance the project enough to justify its inclusion and the subsequent schedule delay and cost increase.
Status	Closed
Approved Signature/Date	
Denied Signature/Date	*Jim Oglethorpe / Project Sponsor / 3-27-20XX*

What it isn't?

If during the project it is unclear if the request is a change to the project plan or simply a clarification of what was intended, your project plan needs more work. The purpose of the change management plan is not to clarify what was intended in the project plan, but to address changes to the project scope, cost, quality and schedules that were initially defined in the plan.

Although changes to a project are inevitable, they should be minimized. Change management is not meant to be used to compensate for a poor project plan. It is in fact an organized way to review any change requests to determine if their inclusion in the project justifies any change to the project's scope, cost, schedule or quality.

How do you know when you are done?

Change management is an on-going process throughout the life of the project. This is one of the most important tasks the project manager is responsible for managing. You are not done with this until the customer formally accepts the final project deliverable(s).

d. Quality Assurance

Introduction:

According to the Project Management Institute, quality is defined as "conformance to requirements and fitness of use." Put another way, this means the project produced what you said it would (as defined in your plan) and this result satisfied your customer's needs. Quality assurance is verification **throughout** the project that you are doing what you said you would, when you said you would do it, for how much you said it would cost and that this result will

meet your customer's expectations. Quality assurance must address all of these factors in a way that is integrated with your project plan, not as a separate set of activities.

How is quality assurance planned for and managed?

In order to successfully complete our project for the health club a number of different deliverables must be produced and accepted by the client in order to achieve the project objectives. These were defined in our project plan. One of the deliverables (this is also an objective) is to reduce clerical costs post implementation by 20%. A key to successful project completion is to define how to verify the work is being done in a way that will achieve the stated objective(s). This must be done **during** the course of the project not just at the end of each project phase or the project itself. If we wait until the end to verify that the project met its quality standards, we might be in for a rude and potentially expensive awakening. It is critical to assess quality throughout the project in order to prevent potential cost and schedule overruns and to reduce the chance of disappointing our client. These verification methods are also referred to as quality assurance.

For the health club to reduce clerical costs by 20% at the end of the project, a number of things must happen during the project. This includes a new system must be designed and implemented that members can use to register themselves for club facilities. This system must be accessible 24/7 and actually be used by our members if we expect to achieve our cost reduction objective. At the same time, we can't lose all of our clerical staff during the transition to the new system. If we do, we will have to hire and retrain new staff along with dealing with other disruptions to customer service. This will cost us money, distract us from our project and create customer service problems during the transition. All of these will result in lower customer satisfaction; in other words lower project quality.

As project manager you are responsible for quality assurance. An important part of your role is to identify ways to verify that your project team is doing a quality job on each deliverable. These could include the following: Rather than wait for the reservation system to be finished, start by developing a stripped down version of the new reservation system that you can get customers to start using as a test. As customers enter the facility

divert some percentage of them to the prototype where they can make their own reservations with assistance from a project team member. Over time your team will produce multiple iterations of this system in order to get user feedback. This allows the team to do several things: one, get early and regular feedback from users about both the ease of use and usefulness of the new system; two, make customers aware of this new service; and three, start to assess if diverting some percentage of customer reservations to the new system during this testing process will in fact reduce clerical costs when the system is fully operational. These quality assurance activities are identified during project planning and added to our quality assurance plan, our work breakdown structure, project schedule and budget.

As the customers use this system, the project team will make improvements to it based upon their feedback. These improvements will focus on making the system easy for them to use without assistance and useful enough that they will want to make their own reservations. This is an iterative process with on-going feedback as part of the quality assurance process.

A simple and powerful tool that you can use to develop and manage quality assurance is commonly referred to as the quality assurance checklist. This checklist should be broken down by project objective/deliverable with a place to note how to verify if this objective/deliverable is in conformance with requirements and is fit to use. A third column should be available to report any defects/discrepancies, a fourth to record the plan to address any defects/discrepancies and a fifth to record status and due date for this activity.

It is also a good idea to have an independent person assess the quality of your deliverables. This is commonly referred to as a quality assurance audit. This third party will tend to be more open to providing constructive feedback that you and your team might not be willing or able to provide. You should also try to get someone with experience on a similar project as they will likely provide more useful feedback based upon their own experiences. This individual(s) can use the same checklist shown below that your team is using for this review, although it is likely they will want to add some of their own criteria to it.

Sample Quality Assurance Checklist for week ending 5/24/2XXX

Objective/ Deliverable	**Verification Method**	**Defects/ Discrepancies**	**Methods for Addressing Defects/ Discrepancies**	**Status / Due Date**
Reduce clerical costs by 20%	Iterative Prototyping	During testing most of the customers found it difficult to assess whether a court was available or already reserved	Assign Yolanda to rethink the user interface to make court availability intuitive for our customers. Retest with customers after updates are made.	Open / 6/5/2XXX
Reduce clerical costs by 20%	Employee satisfaction / turnover	Recently one of the clerks indicated frustration with how the club was replacing valued employees with this new system.	Ekaterina will meet with all of the front-end clerks together and individually to assess how they are feeling about this new system and address any concerns they have. She will make recommendations for changes to the retention plan already in place.	Open / 6/1/2XXX

These checklists will also contain items based on lessons learned on prior projects and will be updated on a regular basis as appropriate throughout the project. The project manager has elected to record quality assurance activities on a weekly basis for this project.

What Quality Assurance is not!

Quality assurance is not something you do at the end of each project phase or at the end of the project; it is done continuously throughout the project. Waiting to verify quality after the deliverable has been produced is commonly referred to as corrective action. The cost to prevent a defect is much less than the cost to correct a defect that has already been made. If you perform corrective quality control, you will most likely have an unhappy client, while also exceeding your project budget and schedule.

How do you know when you are done?

Quality assurance must take place throughout the project. You are not done with identifying and verifying quality assurance criteria until after your customer accepts your final project deliverable.

9. Project Closing and Lessons Learned

a. Project Closing

When a project is done – the application and new processes are implemented, users know how to use it, and any missing documentation has been completed – the project team will most probably be disbanded. Part of the team may stay on to maintain the system and business processes, but others will go on to new areas. Before this happens, however, it is important to have a formal closing of the project.

This closing serves several purposes. First, this is the time to assess which of the measurable objectives have been accomplished and which require more time before they can be truly assessed. As part of this assessment you will be asking your client to sign-off that the project is complete. If you are billing for this work, you will also be submitting a bill to them for payment. For objectives which are on-going operations, such as non-peak utilization, you should make sure that there is a mechanism in place to capture and review this information on a regular basis.

Second, you should make a list of requirements that were proposed but not implemented in the first release. This

information should be provided to management as input into their regular process to determine what projects to undertake.

Third, the entire project team should meet as a group to go over what happened on the project – what was done well and where the problems were. All the lessons learned on the project should be documented for use by future project teams as part of a continuous improvement effort.

b. Lessons Learned

Introduction:

"Human beings, who are almost unique in having the ability to learn from the experience of others, are also remarkable for their apparent disinclination to do so." Douglas Adams

If we as project managers are armed with the knowledge of what went wrong on similar projects, why would we want to struggle through the same mistakes made on these other projects? One reason could be that many organizations don't reward project managers for learning from and avoiding these same mistakes. Whether your organization values lessons learned or not, as a project manager you can vastly improve your chances of project success by learning

from others' mistakes. You can also vastly improve others' chances of success by sharing yours. In my experience when you give you often get more in return.

How are Lessons Learned Identified?

At the beginning of your project, identify if your organization captures lessons learned in a central place. If they do your job just became easier. Look through it to find similar projects and/or for lessons learned that you think might be relevant to your project. If it is not captured at all or not consistently from all projects, you will need to identify projects and their managers who have worked on similar projects and collect this information from them through interviews. Do this at the beginning of your project and use this information to update your project plan. In particular focus on updating project risk management, communications, schedule and cost, although all aspects of the project could be improved from this insight.

Throughout the course of the project, you should be capturing details of what went well or what went wrong and why. This information can be shared with your team and with the other project managers you identified earlier with similar project experience to learn how to avoid these

mistakes (or continue your success) as you progress through the project. A great way to collect this information is in regularly scheduled status meetings, steering committee meetings and by going out and asking other stakeholders what is working and what is not, including how to fix these problems.

On our project, we have learned several important lessons that were brought back to the project team and incorporated into our project plan. In addition, we learned an important lesson from an employee who had worked on a similar project at another health club before joining our organization.

Self-Service Web Site Lessons Learned

Project Manager: Helen Johnson

Project Dates: 2/23/2XXX to 10/1/2XXX

Lessons Learned	**Category**	**Impact/Resolution**
Influential stakeholder missed during the stakeholder analysis. Even if you think a person isn't a key stakeholder, if they have the potential to influence your project in any way, make sure to meet with them during planning and keep them up-to-date on project status on a regular basis.	Communications	Requests to change project objectives and scope after charter was approved. Project manager met with this stakeholder to first understand their concerns and then to identify ways to address them. It turned out that their needs were in fact being met by the project, but they felt left-out by not being contacted during the planning process and by not being kept up-to-date on project status. This mistake cost the project manager two days of work following this up and resolving it with the stakeholder.

Lessons Learned	**Category**	**Impact/Resolution**
Project delayed due to lack of knowledge on the technology being used to develop the web site. With any project there are certain skills that you may not have on your team. Identify these as early as possible and either get resources with these skills or get existing resources scheduled for training before these skills are needed on the project.	Technology	Implementation was delayed for two weeks while the development team attended training on the software chosen to implement the web site.

Lessons Learned	Category	Impact/Resolution
Getting users to make reservations on-line rather than by phone was a significant change for them. Provide incentives to customers for using the new system that will get them to change faster.	Change management	Even though the new system was implemented by October 1st, clerical costs actually went up for the first year due to the difficulty of getting customers to make reservations on their own. In fact what happened is customers would pull up the web site to view availability and call to actually make the reservation with our clerical staff. We finally added a fee for making reservations over the phone which quickly got customers to use the web site to make most of their reservations.

What Lessons Learned are not!

Lessons learned don't always provide the answer to a problem on a project. Team members and customers can get both frustrated and concerned about project managers who

look for all the answers in other project documentation. As you gain more experience, you will have a bigger reference catalogue from which to work (from other mistakes you have made), and you will be able to more easily interpret what is relevant from other projects on your project. In the meantime, make sure to identify several people who have experience implementing similar projects to rely on throughout the course of the project.

How do you know when you are done?

Throughout the course of the project, you, your team and project stakeholders will be identifying lessons learned. A great way to surface these and get them documented is during project status meetings that you will be holding on a regular basis. On your project you will be done identifying these lessons at the end of the project, no sooner. By documenting these lessons learned, including their impact to your project and how these mistakes were resolved, you are providing valuable insight to future project managers within your organization. For these to be useful, there also needs to be a central place to store them where future project teams can access them easily.