THE COMPLETE BOOK OF

Project-Related
Terms & Definitions

MYSTERIES
EXPLAINED

**The Complete Book of Project-Related Terms and Definitions:
Mysteries Explained**

Mochal, Tom, 1957–

The complete book of project-related terms and definitions: mysteries
explained / Tom Mochal.

For additional information on requests for translations, please contact
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Overview of TenStep

We hope that you enjoy this book from TenStep, Inc. We specialize in business methodology development, training and consulting. Our focus is to provide value to our clients in the areas of project management, program management, Project Management Office, portfolio management, the development life-cycle and application support.

Our products and services fill an important gap that exists in most organizations. For instance, let's assume that your organization needs to become much better at managing projects successfully. Once you decide you need to be better, you are probably not going to run out and buy software tools. The first thing you will probably do is realize that you need to have a good, common set of processes, best practices, templates and other components of a common methodology.

This is where our products and services come in. When you realize that you need a good set of common processes, you can either spend months and months creating them from scratch, or you can use our products as your base, and make the minor customizations that are needed for your specific organization.

Building a methodology from scratch could take months (or years) and require a large expenditure of money and time. Using our products and services allows you to have the basic methodology in place immediately. We can train your people in using the methodology and we can help you with training and implementation services, such as:

- Basic and advanced project/program management and project lifecycle classes

- Project Management Office and Portfolio Management workshops

- Methodology deployment services

- Methodology customization

- Coaching and mentoring

- Project assessments and quality assurance

- Much, much more

Our products and services cover project/program management, Project Management Offices, portfolio management, the development life-cycle and application support.

Our value proposition is simple - we take the time and effort to develop these important business processes so that you don't have to. We also update and enhance these important business processes so that you don't have to.

How can we best help you meet your important business objectives? Contact us for more information.

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Overview of this Book

The purpose of this book is to provide easy to understand definitions and explanations for many of the terms commonly used in connection with projects. These terms are used in our TenStep product line. The terms are arranged alphabetically and each term references the TenStep product where the term is generally used. There are six TenStep products referenced.

- Project management, www.TenStep.com (The TenStep® Project Management Process)

- IT development lifecycle, www.LifecycleStep.com (The LifecycleStep™ Project Lifecycle Process)

- Program management, www.ProgramStep.com (The ProgramStep™ Program Management Process)

- Project Management Office, www.PMOStep.com (The PMOStep™ Project Management Office Framework)

- Portfolio Management, www.PortfolioStep.com (The PortfolioStep™ Portfolio Management Framework)

- Application Support, www.SupportStep.com (The SupportStep™ Application Support Framework)

Rather than provide a quick definition like you might see in a dictionary, this book attempts to define the terms in a way that is easy to understand and comprehend. In some cases, this requires the definition to be multiple paragraphs or even a page or more.

We will be adding new terms and definitions to this book in future editions. If you have terms that you think would be valuable, please email us at info@tenstep.com.

Acceptance Criteria

(Product: TenStep Project Management Process)

Acceptance Criteria is a quality assurance technique. The Acceptance Criteria should describe the processes and checkpoints that need to take place before the solution is considered complete. Does the system have to be perfect? You better hope not. But the Acceptance Criteria should define how the acceptance decision will be made. For instance, the sponsor may accept a system with certain minor types of errors remaining, but there may be other levels of errors that will render the system unacceptable. Part of the Acceptance Criteria may specify the types of testing that take place. For instance, the client may want to thoroughly test security in a separate and focused test, something that may not have been in the original plans of the project team. However, after defining the Acceptance Criteria, the project manager knows that this extra test should be planned and scheduled.

Examples of the types of events or activities that would be in the Acceptance Criteria are:

- Ensuring the requirements are formally approved
- Proving (through traceability or Requirements Testing) that all requirements are accounted for in the final solution
- Accounting of budget and expenses on the project
- Specifying the testing criteria and/or specific types of testing to perform
- Defining implementation options - for instance, first running a pilot test
- Ensuring that the solution is stable
- Validating that the training is completed
- Specifying how long the project team must support the solution before turning it over to the support organization
- Fixing all major bugs and errors, although minor bugs and nuisance errors could be unresolved
- Collecting certain metrics and validating against predefined targets

The Acceptance Criteria should be defined in writing and approved by the sponsor. All things being equal, if the Acceptance Criteria are met, there should be no reason that the sponsor would not approve and accept the final solution.

Acceptance Testing

(Product: LifecycleStep Project Lifecycle Process)

Your project is getting close to the end. The programmers have unit tested the code, and the entire team has participated in the series of agreed upon testing: interface, system tests, performance tests, etc. Now you only have one major test to go – user acceptance testing. Ultimately, the client owns and must live with the solution being developed. The purpose of

acceptance testing is to allow the client to validate that the solution meets his or her requirements. In fact, depending on how your others tests were performed, this final test may not be necessary. If the clients and users participated in system tests such as requirements testing and usability testing, they may not see a need to perform a formal acceptance test. However, it is very likely this additional test is necessary for the client to give final approval for the system.

This is the last opportunity the client has to make sure that the system is what they expect. When this final test is complete, the team expects that the client will formally approve the system or point out any problems that still need to be resolved. Therefore, unlike all the other tests performed so far, acceptance testing is the responsibility of the client. Of course, unless the clients are very savvy in testing techniques, they will need the participation of the project team as well.

Action Items

(Product: TenStep Project Management Process)

An action item is work that requires follow-up execution. By their nature, action items normally cannot be planned for in advance. They arise on an ad-hoc basis during meetings or as a by-product of working on something else. An action item is assigned because there is not enough knowledge, expertise or time to resolve the item at the time it originally surfaces.

In many cases, action items are trivial in nature, but in other cases they can require substantial work to complete. Action items need to be assigned, worked on later and completed. (If they are not going to be completed, they should not be called action items. Instead, simply note that the item will not be followed up.) Examples of action items include forwarding specific information to someone, arranging a meeting and providing a quick estimate on a piece of work.

Sometimes an action item is established to investigate an area where there may be a potential problem. Because of this, action items are sometimes wrongly mixed in with issues. An action item should not be confused with an issue. An issue is a problem that will have a detrimental impact on the project if left unresolved. An action item may lead to the discovery of an issue or a risk (a potential issue in the future), but the action item itself is not an issue.

There are two common approaches used to manage action items. The best approach is to document the items as activities in the project schedule. A resource and end date is assigned as well, and the activity is then managed and tracked like any normal activity. In general, this is the better approach to follow because it keeps the work items in one place, and it allows the project manager to enforce the discipline of knowing 'if it's not on the project schedule, it will not be worked on.'

Another popular approach is to track and manage action items on a separate Action Item Log. This can make sense to some project managers because typically action items are small enough that you may not want to track them on your real project schedule. If you use this approach, action items can be identified, documented, assigned and resolved using the following process:

Action items may be identified by anyone on the project team. They often arise out of interactions between and among project team members, particularly at meetings.

The project manager or a designated person enters the action item in the Action Item Log. This records its existence to ensure that it receives attention and is carried out.

The project manager or designated person assigns the action item to a team member who assumes responsibility for the action item and takes the necessary steps to complete it. The project manager may be assigned action items as well.

A date for the completion of each action item should be entered into the log, along with an estimate of the amount of effort required.

If completing an action item involves more work than anticipated, it should be brought to the attention of the project manager.

The Action Item Log should be reviewed at regular intervals during project team meetings to ensure that action items have been completed successfully.

A separate Action Item Log only makes sense if the work activities are one or two hours of effort. If the effort is much more than that, you probably want to place the action item in the project schedule. It takes effort to work on and close an action item. If the work effort is anything other than trivial (one or two hours), the project manager should track the activity on the project schedule, not on a separate Action Item Log. Remember that team members should all be fully allocated. If team members are assigned action items that take more than a couple hours of effort, it can have a negative impact on their previously assigned work. If the action item is placed on the project schedule, the project manager will be able to see the detrimental impact that may occur with the assignment of this extra work. Action items are normally time sensitive. If an action item has not been completed in a reasonable timeframe, it should be closed and eliminated.

The project manager (or designated person) must follow up to ensure that action items are closed. In general, if they are not assigned to a specific person, have no target date or are not followed-up, there is a good likelihood that the action item will not be completed. If it is not going to be completed, there is no use in documenting and tracking it at all.

Activation

(Product: PortfolioStep Portfolio Management Framework)

Activation is a step in a portfolio management process. Managers build schedules to start and complete as much of the approved work as possible. Operations and support staff are in place at the start of the year and will be in place all year. Projects and leadership initiatives, however, need to be scheduled throughout the year based on business urgency and available staff. It is not efficient to try to start all projects at the beginning of the year - if you schedule all of your projects at once, you will have to hire excess staff during the peak workload, and then have staff idle during the slower time.

The Activation step contains a mini-Business Plan Process to account for new work that surfaces during the year. This work needs to be selected, prioritized and authorized. If new work is authorized, it may mean that some work that was previously authorized will need to be canceled or delayed. It ensures that all the authorized work is scheduled appropriately based on business priorities and available staff.

Active Listening

(Product: LifecycleStep Project Lifecycle Process)

It has been said that the best communicators are actually the best listeners, not the best speakers. Remember that communication is a two-way process of expressing and receiving meaning between a speaker and a receiver. The speaking part is only half of the communication model.

In a sense, speaking is the easier of the two sides of the conversation. When you talk, you know what you are trying to say. However, when you listen, you must understand what the other person is saying. This requires you to use your understanding of the background, context and assumptions behind the communication. For many people, this is the harder part of the communication model.

When you are gathering requirements, active listening is the most dominant skill. This is especially true when you are using interviewing and group interviewing techniques. Your role as a speaker is typically to set up the questions. The most important part is to listen to the responses. The responses will contain requirements (or portions of them). The responses will also dictate the type of follow-up questions you will ask or where you take the discussion.

"Active listening" is the term used to describe this proactive listening process. You need to really focus on what is being said to know how to respond and to make sure you are identifying and capturing requirements accurately. There are a number of techniques associated with active listening.

Look at the speaker. This is important to help make the speaker feel at ease. Make eye contact when you talk, and let the interviewee make eye contact with you when he/she talks. Of course, there will be times when you will be taking notes, and, in fact, you will spend a lot of time writing during the discussion. However, it is important to make eye contact as often as possible during the discussion.

Show an interest. One of the worst things that an interviewer can do is act like he/she really would rather be somewhere else. The interviewee can pick up the clues that say that the interviewer is not really interested in the discussion. When that happens, the interviewee will tend to shut down and you will not end up with the requirements and insight you are looking for.

Draw the information out. Remember that your active listening techniques have two major purposes. First, you want to make sure that you recognize any requirements that the speaker is providing. Second, you need to hear the responses to understand the direction that the conversation should go next. Your active listening and ability to ask good questions will allow you to draw the information out of the interviewee. In many cases, the interviewee has a hard time expressing the requirements. This may be because he/she does not have good communication skills, doesn't feel comfortable with the discussion, or perhaps does not really want to be there. In any case, active listening and good follow-up questions can help you get the information that you need.

Activity

(Product: TenStep Project Management Process)

Activities are typically the smallest unit of work identified on the project schedule. They are small enough that it is clear what is meant by the activity and it can be discreetly managed by the project manager. More than one person can be assigned to an activity. (Activities can be broken down further into "tasks" but that level of detail is generally too low for effective project management.)

Actual Cost (Earned Value)

(Product: TenStep Project Management Process)

Actual Cost (AC) is a part of "Earned Value" calculations. To calculate this number, add up the actual cost for all the work that has been completed up to that point in the project. This could include the internal and external labor costs, as well as invoices paid (or perhaps purchase orders approved). If you have an automated financial system that will crank these numbers out, it is not too hard of a task. If you cannot capture all of the costs automatically, it could be very time consuming. If your project only consists of labor, then the cost and the effort will track along the same lines. If you have a lot of non-labor costs in your budget, then the project costs don't directly tie to the labor used.

Alignment

(Product: PortfolioStep Portfolio Management Framework)

Alignment means that every organization and every person is trying to move the company in the same direction and toward a common vision. Alignment is established through the creation of consistent goals and objectives for every organization and every person in the company.

A company's mission statement provides a concise description of the purpose for the company being in business, and usually speaks of the value the company is trying to deliver to its customers. In other words, the mission statement describes the reason for the existence of the company. The company mission is defined at a high level and typically does not change from year to year. It might get tweaked once in a while, but it is not substantially changed unless your company has a major change in business focus.

Each year, companies also create goals. Yearly goals are outcomes the company wants to achieve to help it meet its mission. Goals are also written at a high-level and may take more than one year to achieve. Company goals can change from year to year, although they are written at a high-enough level that many can be similar from one year to the next. Company goals provide more detail and guidance to the organization on what is important to achieve in the next one to three years. As an example, let's say part of your company's mission is to "… be the leading supplier of high-quality widgets to the aerospace industry…" One of your company goals might be to increase your market share of widgets in the aerospace industry, while another might be to have the highest quality widgets in the industry.

Alignment is created by first having the company create overall company goals, strategies and objectives. Each high level organization then creates more specific goals, strategies and objectives that make sense for their organization, while also allowing their organization to contribute toward the company goals, strategies and objectives. Likewise, each lower level organization creates goals, strategies and objectives that are very specific and tactical, while still helping them contribute to the organization they are within. This process continues down to each individual person. Each person should receive specific objectives that will help their organization, which helps the organization above them, which ultimately helps the company.

Alignment is all about having the resources in your company striving toward the same general purpose. Alignment comes from making sure that people and organizations know what is important to the company. It also means that people have incentives to move the company in that one direction and not in directions that are counter to the general strategy.

Analogy (Estimating Technique)

(Product: TenStep Project Management Process)

Even though all projects are unique, some projects are very close to others. In this technique, you compare your project to past projects with similar characteristics. This is a great way to estimate work since it allows you to reuse prior history. For example, let's say you are upgrading to a new release of your accounting software. Is this the first time you have implemented a new release? If it is, then you have no prior history. However, if you have upgraded releases before, you should have a pretty good idea of what it will take to upgrade this time. Even though the project is unique, it is very similar to work that was done previously.

Analyst

(Product: LifecycleStep Project Lifecycle Process)

In general, the analyst is responsible for ensuring that the requirements set forth by the business are captured and documented correctly before the solution is developed and implemented. In some companies, this person might be called a Business Analyst, Business Systems Analyst, Systems Analyst or Requirements Analyst. While each of these titles has its particular nuances, the main responsibility of each is the same - to capture and document the requirements needed to implement a solution to meet the clients' business needs. If requirements are not captured and documented, the analyst is accountable. If the solution meets the documented requirements, but the solution still does not adequately represent the requirements of the client, the analyst is accountable.

Application (Software Development)

(Product: LifecycleStep Project Lifecycle Process)

The term "application" or "business application" refers to the software systems that are used to automate otherwise manual business processes within your company. Examples of applications include payroll, accounts payable, Customer Relationship Management (CRM) software, time reporting, inventory management, etc. In some companies, these entities might be referred to as "systems." Applications can be internally developed, or they can be packages purchased from an outside vendor.

Application Business Owners

(Product: SupportStep Application Support Framework)

Each application in your organization should have a primary application owner. In many organizations, it is obvious who this person is, since he or she is typically the primary contact for the application. However, in other companies, this role is ambiguous, and there can be some uncertainty surrounding who is the primary client representative for the application. However, it is important to have one person designated as the primary business contact.

Application Business Owners have a number of responsibilities:

- They approve all requests for application changes and enhancements.

- They are the first contact point for other stakeholders who have questions or problems with the application. The Business Owner may refer the stakeholder to the appropriate support staff member, but the call goes through the Business Owner first. The interested stakeholder should not contact the support contact directly.

- They are the people on the business side with primary accountability and the responsibility of making sure that the application is accurate and stable. They fulfill this responsibility through a partnership with the application support team.

Business Owners are typically some of the most knowledgeable people in how the business and the business application work, but this is not a requirement. However, in many cases, a business contact has a good understanding of the business, but does not have a strong understanding of the application. In that case, he or she will usually gain an expert level of knowledge in the business application by being in the Application Business Owner role.

Application Inventory

(Product: PortfolioStep Portfolio Management Framework)

One important area to inventory is your application system. There are two types of applications. First are your business applications, which are the software systems that you use to run your company and manage your business. Examples of business applications include financial systems such as General Ledger, Accounts Receivable, Payroll, Human Resources, Customer Relationship Management, etc. Make sure that you inventory the applications that your company developed, as well as all packages and outsourced solutions.

The second type of is the software that runs your IT computer infrastructure. These are typically not used by the client organizations, but are internal to IT only. This group of applications might include Help Desk software, IT Asset Management, Job Scheduling, Network Management, etc. These are all larger software systems that typically require ongoing support.

Many organizations already have an up-to-date application inventory. If you do, then use it - don't recapture everything. However, if you don't think you have one, you may still be in luck. If you can find this inventory, you can use it as the starting point for this portfolio management process. If your organization has not kept the inventory up-to-date, you will still need to validate the information. However, this will be easier than having to start from scratch.

An application inventory describes the specific applications in your organization (or company). This inventory becomes a communication vehicle to highlight the scope of your application support organization's responsibilities. Information on the inventory includes:

- Application name.

- Purpose. The business purpose of the application.

- A designation of vendor/internal to signify whether this is a third-party package written by a vendor or developed in-house.

- Releases or versions to identify the current release(s) that you are supporting. Third party packages always have versions or releases, as do many internally developed applications. You may be responsible for supporting more than one release. If so, include all of the applicable versions.

- Platform/operating system.

- Software/hardware.

- Frequency of run. Detail how often the application runs, and the timing.

- Major interfaces. Describe other major applications that this one interfaces with.

- Much more. There are many, many characteristics that can be captured if they will be a help to your organization.

Application Maintenance Manual

(Product: LifecycleStep Project Lifecycle Process)

The Application Maintenance Manual (AMM) is the primary deliverable that is created by the development project team for turnover to the support team. The AMM contains information on the application that the support team will need to know to be able to effectively support the application. In general, support teams rarely keep this manual up-to-date, so any rapidly changing information quickly becomes out-of-date. For instance, even though the development team may have had design specs on the program code, this information gets quickly outdated for two reasons. First, when coding changes are made to the production application, the design specs normally do not get updated. Second, when the support staff needs to investigate errors or answer questions, they typically go straight to the code to understand the logic flow. In either case, the design specs get quickly out of date. When any piece of the AMM gets to the point where the material is no longer up-to-date, it will quickly get ignored and bypassed by the support staff. That is why no matter how much time and effort the development team spends on the AMM, the manual is rarely utilized five years later.

Application Primary and Backup Support

(Product: SupportStep Application Support Framework)

If your team supports a number of applications and technologies, it makes sense to assign a primary support person to each application. Each application should also have a designated backup. If the application is large enough, you may have others providing support as well. However, it should be clear who the primary support person is. You can have multiple backups, but only one primary support person.

The primary support person is sometimes called the Primary Support Analyst. The backup is called the Backup Support Analyst. This designation applies to a specific application or set of applications. Therefore, it is possible that a person could be a Primary Support Analyst on one application and the Backup Support Analyst for others.

The Primary Support Analyst takes the lead in resolving problems or answering questions. It is understood that he or she is the most knowledgeable in how the application works. He or she may not be the most knowledgeable on the first day as the Primary Support Analyst, but by having the support calls assigned to him or her first, he or she quickly becomes knowledgeable in how the application works.

Typically each application has at least one designated backup as well. The backup helps out when the primary person is busy or out of the office. Backups are important, but they are also an area many companies do not put enough emphasis on. When applications have support problems and the Primary Support Analyst is not available, the backup needs to know enough to be able to resolve the problem. If you do not have good backup analysts, you will also have problems when the Primary Support Analyst leaves the group, since there is a large knowledge gap when the backup is elevated to primary status.

Over time, the people in your group will develop a level of competency in a number of applications. One reason for this is normal job rotation. After a person has mastered his or her knowledge of an application, many times he or she will want to learn something new. He or she ends up taking primary support for another application and then becomes a backup for the original application. Another reason is that there are times when an application requires help from team members other than the primary and backup. Other team members can become involved and develop a level of competency as well.

It is a good practice to understand and map the various applications in the group, and to know which team members have some level of competency. You may find that your larger applications have a number of people with some level of knowledge, while other applications may be at risk because the knowledge level in the group is very low. Your support group should track each application, the Primary Support Analyst, backup analysts and any others with application knowledge. This tracking will allow the manager of the group to determine if your team has any applications with an unacceptable knowledge gap. If so, you have the information you need to strengthen the group's knowledge in those applications.

Application Server Inventory

(Product: SupportStep Application Support Framework)

Each IT applications support group should have an inventory that specifies the computer platform that each application runs on. If all of the applications run on a mainframe, this information has only a marginal value, if any. However, for client-server and web applications, this inventory can be quite helpful. Because of the nature of the production environment, there can be a decent amount of support that is required to maintain the server environment. For instance, if you have a client-server application go down, you may not be able to fix the problem yourself. You will probably need to identify the proper server for others to perform server support. Likewise, if you have a production server that is running out of disk space, it may well be the application support staff that is responsible for monitoring the environment and requesting a disk upgrade.

In addition, like the application inventory, the server inventory will be a good vehicle for communication and cross training.

As you complete the inventory, make sure that you only inventory the servers that house your production applications. There may be hundreds or thousands of servers in your entire company. For purposes of the inventory, you are only interested in those that hold your production and test applications. The data to capture include:

- Server name

- Prod/test

- Description of the application(s) residing on the server, or the generic name of the server itself

- IP address

- Server ID/password

- Model/CPU/MHz/RAM/disk space

Asset Groups (Portfolio Management)

(Product: PortfolioStep Portfolio Management Framework)

There are many different asset groups that can be inventoried as a part of understanding what makes up your portfolio of work. These areas need to be inventoried so that you can better manage your work and you can more clearly see how your decisions impact different aspects of the portfolio. In the IT organization, for instance, the following areas should be considered:

- *Software applications.* These include all internally developed applications, as well as package solutions and outsourced applications. You should definitely include all of your business applications, as well as internally focused applications like your helpdesk, time reporting and asset tracking software.

- *Development software and tools.* This is the software that you use internally to work on other assets. For instance, the IT development group may have programming languages, databases, analysis tools, project management tools, testing tools, etc.

- *Desktop hardware and software.* This includes a reference to every desktop and laptop machine in your organization, as well as the major software on each machine. You need this hardware inventory to make efficient use of your resources. The software inventory is used to ensure you are in compliance with user counts in your license agreements and to make sure that only standard, approved software is utilized. Tools exist that can automate the hardware and software inventory process, but you may also need to do a one-time physical inventory of hardware to make sure everything is caught. (Automated tools won't account for machines that are in closets, on floors, and otherwise disconnected from the network.)

- *Systems software.* This group includes server operating systems, systems utilities, network management software, middleware, etc.

- *Network hardware.* This group includes physical networks, routers, servers, mainframe computers, etc.

- *Telecommunications.* This includes phone hardware, software, switches, lines, etc.

- *Major data stores.* This includes your major databases, repositories, warehouses and other areas where substantial company data is stored. This group is application focused, not technology focused. You want to inventory the fact that you have a General Ledger database with all of your company financial accounts, transactions and balances. It does not matter what technology the information is stored in for the purposes of this inventory.

Assumption

(Product: TenStep Project Management Process)

There may be external conditions or events that must occur for the project to be successful. If you believe such a condition or event is likely to happen, then it could be an assumption.

The following items are not considered assumptions.

If an event is within the control of the project team, such as having testing complete by a certain date, it is not an assumption. It is part of the approach.

If an event has a 100% chance of occurring, it is not an assumption, since there is not 'likelihood' or risk involved. It is just a fact.

Likewise, if an event has a zero percent chance of occurring, it is not an assumption. It is a fiction.

Examples of assumptions might be that 'budgets and resources will be available when needed ...' or 'the new software release will be available for use by the time the Construct Phase begins'.

Auditing for Security

(Product: LifecycleStep Project Lifecycle Process)

Your internal and external auditors are typically interested in making sure that you have good, sound security policies in place – and that you are following them. The best laid plans are meaningless if they are not executed, and auditing makes sure that security is in place and enforced appropriately. Auditing is also very interested in separation of duties. This means that different people or groups are involved in various parts of a process to ensure that one or two people cannot collaborate for personal gain. This includes, for example, making sure that people cannot approve their own expense report. On the IT side, it means things like making sure business users cannot directly manipulate production data and that developers do not approve their own source code changes to be moved to production. Depending on the nature of your solution, the Auditing group may have requirements in terms of how people interact with processes, the functions certain people can perform, audit controls, approval requirements and the length of time that data should be retained.

Authorization

(Product: PortfolioStep Portfolio Management Framework)

Authorization is a step in a portfolio management process. After your work for the next year is prioritized and balanced, the most valuable and aligned work is authorized for the coming year. This authorization process includes actually allocating funding to the most important work. In many organizations, funding is allocated at a certain level for each department. There is usually more work prioritized than the available budget. So, you start funding your highest priority work (1, 2, 3, 4 etc.) and continue until the money runs out. In other words, the projects that receive funding are considered "authorized" and those that are of lower priority will not be authorized for the coming year.

Authorization does not guarantee that the work will be funded. Changes in business conditions or newly surfaced work in the coming year could bump some authorized work off the approved list. However, all things being equal, authorized work will be scheduled and executed in the coming year.

Backlog

(Product: SupportStep Application Support Framework)

It is possible that the sponsor may not approve scope change requests during the project, but they may be viable requests that can be done at a later time. These types of change requests should be captured on a backlog list. After the project is completed and the solution is moved to production, there may be opportunities for enhancements or a Phase II project. However, even at a later date, these changes will be implemented only if they are approved and if funding is available.

A backlog of requested change can also be made for each application by the support organization.

Balancing

(Product: PortfolioStep Portfolio Management Framework)

Portfolio balancing is the process of organizing the prioritized components into a component mix that, when implemented, is best aligned with, and best supports the organization's strategic plan. PortfolioStep makes a major assumption that the required balance points are usually set by the Executive for allocating resources, financial or otherwise, between the competing demands within a portfolio. These are the demands raised by the various business units such as Operations, Projects, Other Work, and so on. The balance points may be set in terms of actual dollar amounts, but more usually are set in terms of percentages. The latter approach provides more flexibility.

Optimizing the portfolio means making some final cuts and/or adjustments such that the combination of projects and other work gives rise to the maximum benefits to the organization given the resources and funds available.

Benchmarking

(Product: PMOStep Project Management Office Framework)

You don't really know how efficient and effective your processes are unless you can compare yourself against other companies. You may find, for instance, that after implementing project management processes, your average project budgets are reduced by 10%. However, this does not tell you that you are efficient. It only tells you that you are more efficient than you were previously. If you compared yourself against outside companies, for instance, you may find that it still takes you twice as long, and twice the cost, to deliver projects of similar size and complexity than other companies. This would be very important information to know.

Benchmarking studies (one-time) and benchmarking programs (longer-term) are a way to compare your organization against others. Benchmarking requires that you gather a set of predefined metrics that describe the result of very well-defined processes. This information can be used to create benchmarking statistics that allow you to compare your organization against others. If you determine that others are doing significantly better than you, you can usually talk to the benchmarking company or to the actual companies with better results to see what they are doing differently from you. This information can be evaluated to determine if there are similar changes that can be applied to your organization to achieve similar results.

Best Practice

(Product: TenStep Project Management Process)

Best practices are the winning strategies, approaches, and processes that produce superior performance in an organization. A best practice is a by-product of a consistently successful end-result. In other words, best practices are the processes and techniques that help you to be successful on a continual basis – not just for one project.

Big Bang Testing

(Product: LifecycleStep Project Lifecycle Process)

Big bang testing is a technique where you take all the unit-tested modules and tie them all together at once for a large integration test. This approach is great with smaller systems, but can end up taking more time for larger, more complex systems. One of the advantages of big bang is that you uncover more errors earlier in the testing process. In fact, you may uncover initial errors all over the place when the testing begins. If the modules have been well-tested in the unit test, this approach can also end up saving time. It can also be quicker because you do not have to create as many stub and driver programs (stub and driver programs are shells that represent calling programs (drivers) and programs that are called from this program (stubs)).

The biggest disadvantage is that it is harder to track down the causes for the errors since all the complexity was added at once. For instance, if a transaction is not processing correctly, there may be ten modules to track back through to determine the cause. A second disadvantage is that you cannot start integration testing until all the modules have been successfully unit tested. There may be modules that work together that are completed early, but they cannot be tested together until all the modules required in the integration test are completed.

Black Box Testing

(Product: LifecycleStep Project Lifecycle Process)

All programs work on some set of inputs and create some set of outputs. Black box testing looks at the program's inputs and outputs rather than the internal lines of code. Black box testing implies that your program is literally a black box. You are not concerned with its inner workings. All you know is that when you give it a certain set of inputs, it gives back a certain set of outputs. This is true whether the program is a report, a webpage, or an internal calculating procedure.

Note that the unit testing is almost always done by the original programmer. So, although black box testing implies that you do not know the interior workings of the program, the original developer obviously will. This can make it more difficult to do black box testing since the original programmer may have certain biases in his or her understanding of the component that may influence how they conduct the testing. However, even given the potential biases and assumptions, this type of testing is still fundamental to a good unit test.

An example of black box testing is a webpage that takes a numeric employee ID and returns your name, address, and telephone number. You can generate three test cases to test this requirement. First, test with a valid numeric employee id. Second, test with an invalid numeric id. Then enter an employee id with alphas. Theoretically, you could enter test cases for all valid employee ids, and you could test with an infinite number of invalid ids. However, you do not need all of them. Three test cases for this particular example should result in proper test coverage.

Another aspect of black box testing is to test at the boundaries to see if the requirement includes a valid range of input. For instance, if a certain field can hold a number from one to a hundred, you want to test at the boundaries of the range. So, you could create five test cases of 1, 100 (the boundaries), 0, 101 (just out of bounds) and an alpha character. Again, although there are an infinite number of test cases possible, those five should suffice.

Budget at Completion (Earned Value)

(Product: TenStep Project Management Process)

This calculation can be in terms of dollars or hours. It is the Actual Cost (AC) plus the budgeted cost of the remaining work. However, if the Cost Performance Index (CPI) is not 1.0, it means that you are spending at a different rate than your plan, and this needs to be factored in as well. So, the better formula for the Budget at Completion (BAC) is the AC + (Budgeted Cost of Work Remaining / CPI). In other words, if you are running 10% overbudget to get your work done so far, there is no reason to believe the remaining work will not also take 10% more to complete, and your final budget at completion would be 10% over as well.

Business Applications – see Applications

Business Case

(Product: PortfolioStep Portfolio Management Framework)

A Business Cases is used to determine whether or not it makes sense to perform a piece of work. The Business Case is written somewhat at a high-level, but also contains enough detail so that you can make a final determination whether you want to do the work and if you do, what the priority will be. A Business Case document contains information such as a name and description of the work, assumptions and risks, estimated benefits and costs, the urgency and the consequences of not performing the work. The Business Case should also tell you how well the work aligns to your organizational goals, strategies and objectives.

Business Plan

(Product: PortfolioStep Portfolio Management Framework)

In most companies, the result of the Business Planning Process is a Business Plan for the coming year. The Business Plan recaps the current year and then identifies the goals, objectives, strategy, work requests, etc. for the coming year. If your company is small, you may have one company Business Plan. If your company is larger, you may have a company Business Plan supported by a Business Plan from each major organization. The Business Plan is the final planning deliverable that is used to guide the business execution for the coming year. For instance, request for project funding should be validated against what was in the Business Plan. Likewise, major decisions should be guided by the strategy and direction that is set in the Business Plan.

Business Requirements

(Product: LifecycleStep Project Lifecycle Process)

The term "business" requirement has two general meanings. First, the term is often used generally to mean all of the requirements. Used in this sense, gathering business requirements is the process of gathering all of the requirements associated with the project deliverables. From a general sense, all requirements are driven by business need, and therefore all of the requirements are business requirements.

The second way that the term "business" requirements is used is to differentiate requirements that are driven by business needs versus those requirements that are driven by technology considerations. For instance, if a business client says that a new computer application must be able to process 10,000 transactions per day, they are giving you a business requirement. On the other hand, your technical staff may tell you that you will need an Oracle database and a new server. These are not business requirements since the business client does not necessarily care about the technical implementation details.

Business Requirements Report

(Product: LifecycleStep Project Lifecycle Process)

The Business Requirements Report is the final deliverable in the requirements development process. This deliverable consolidates and finalizes all of the requirements information gathered up to this point, including any business models generated. If you are using a software tool to capture the requirements, the tool should provide some mechanism for printing the requirements for the final report. This document provides the following benefits:

- It consolidates the requirements information in one place to provide an overall big picture view.

- Since the requirements will change over time, it is easier to make changes to one document rather than multiple documents.

- The completed document provides a baseline of what is known and agreed to at this time, and can be used to validate scope change requests in the future.

This single document can be shared with the rest of the project team to use as input into test plans, user documentation, training plans, etc.

Capability Maturity Model

(Product: TenStep Project Management Process)

The Capability Maturity Model is a scale from one through five that can be used to gauge how well your company or organization follows common and repeatable processes to get your work done. The low end of the scale (one) describes companies without repeatable processes, where much of the work is chaotic and ad-hoc. The highest end describes companies that use defined and repeatable processes, collect metrics to help them continuously improve their processes, and look for creative ways to do things better on an ongoing basis.

The CMM was developed from 1984 to 1987 by Watts Humphrey and the Software Engineering Institute (SEI). The SEI is a part of Carnegie Mellon University. The work was funded, and continues to be funded, by the Department of Defense (DOD), which was originally looking for ways to compare and measure the various contractors that were developing software for the DOD.

Although the SEI continues to enhance and expand the scope and breadth of various CMM models, the primary focus for most companies continues to be the software development world.

Capital Accounts and Expense Accounts

(Product: PortfolioStep Portfolio Management Framework)

The money used to pay for different types of work can be classified separately from an accounting standpoint, and this distinction may in turn drive some of the decisions that are made in terms of overall portfolio balance. The most obvious is the classification of some spending as "capital" and some as "expense". These categories of expenditures have a strict accounting meaning, although different companies might put slightly different interpretations on the meaning.

Work (and other purchases) that has short-term value is typically considered an "expense" item from an accounting standpoint. The costs associated with this expense work are deducted from revenue in the year in which the expense occurs. On the other hand, work that creates deliverables with a useful life of over one-to-three years can be considered "capital" spending. The cost of capital spending can be depreciated over some period of time, usually three or five years. In other words, if you spend $120,000 on a capital project with a lifespan of three years, you would deduct expenses of $40,000 per year for three years, rather than deduct the entire $120,000 expense in one year.

Many companies try to balance the total amount of capital spending each year as opposed to the total expense spending. Companies then control how they are reporting overall company expenses, which help them manage their profit numbers (revenue minus expenses).

The key to this type of balancing is that you cannot determine whether to capitalize or expense certain types of work at the end of the year. The rules for how you determine which expenses can be capitalized are known well ahead of time. However, if your company has targets as to how much work they want to capitalize versus expensing in the same year, these targets can be used to determine the type of work you want to take on in the first place. This is where you can balance the portfolio spending to stay within your corporate guidelines for capital spending versus expense spending. Using this balancing model, for instance, you may decide not to do a very attractive project this year because it is a capital project, and you may not have any more capital funding left. You may need to choose expense projects instead.

Categorization

(Product: PortfolioStep Portfolio Management Framework)

Categorization is a step in a portfolio management process where you define the terms, scope and definition of your portfolio, and gain agreement on your basic portfolio model. For instance, you need to define information like the following:

- **The organizations covered.** For example, will you include the entire company or just certain organizations?

- **The type of work included.** For example, does your portfolio include projects, support, operations, etc.?

- **The categorization scheme.** This helps you balance your portfolio in areas that are important to you so that you can optimize the overall allocation of resources. For instance, categories could include work that "supports the business", "grows the business" and "leads the business". You could also categorize work as high, medium and low-risk, or perhaps in global versus local categories.

- **The balance points.** For each categorization you define, you would also set some guidelines as to how you think the work should be balanced.

- **The financial models.** When it is time to prioritize the work, you want to make sure that you choose projects that are aligned to your goals and strategies, as well as have the highest value. It is impossible to compare apples to apples if each project has a financial justification based on different models. You need to understand the financial models that your organization wants to utilize and make sure all projects are justified using those models.

The Categorization step may be lengthy the first time you implement PortfolioStep for the Business Planning Process. However, in subsequent planning cycles, you only need to review the prior cycle's categorization. If the categorization information is still valid (and it may be), then this step will be over very quickly. Usually, however, changes in emphasis will occur

that will result in changes to the Categorization. For instance, in one year, you may decide to include only project work in the portfolio. In a subsequent year, you may decide to include all other work categories as well. This will require you to revisit some aspects of this Categorization step.

Change Control Board

(Product: TenStep Project Management Process)

Sometimes on very large projects, the Project Sponsor does not feel comfortable making the scope change decisions alone. This may especially be the case if the effect of the change will impact other organizations. It may also be the case that multiple organizations are participating in, or contributing to, the project funding, and want to have some say in evaluating scope change requests. For these cases, a group of people might be needed to handle the scope change approval.

A common name for this group is a Change Control Board. If a Board exists, it may be more cumbersome to work through. However, the general scope change management process does not need to change dramatically. For instance, there is still a document that initiates the scope change request. The project team needs to determine the impact and cost to the project. The Board must consider the impact, the value to the project, the timing, etc., and then make a determination as to whether the request is accepted.

The Scope Change Procedures must be somewhat more sophisticated to account for the Board. For instance, you need to clarify who is on the Board, how often they will meet, how they will be notified in emergencies, how they will reach decisions (consensus, majority, unanimous, etc.), how incremental work will be paid for, etc.

Clients

(Product: TenStep Project Management Process)

Clients are the main individuals or groups that request and utilize the products and services your organization provides. (These people may also be referred to as customers.) While there may be many stakeholders (described later) it is important to recognize who the clients are. Clients are the ones the organization focuses on - to meet their needs and help them achieve their strategy, vision, mission, etc.

Client Project Manager

(Product: TenStep Project Management Process)

If a project is large enough, the client may have a primary contact that is designated as the overall project manager for the client department. For example, if you are executing an IT project, the IT project manager would have overall responsibility for the IT solution. However, there may also be work on the client side that is needed to support the initiative, and the client project manager would be responsible for this work. The IT project manager

and the client project manager would be peers who work together to build and implement the complete solution.

Coach

(Product: PMOStep Project Management Office Framework)

A coach provides one-on-one assistance to others that need expertise that the coach has. Coaches use their experience and knowledge to help others with immediate questions and problems. The coach also uses these opportunities to teach new skills or reinforce existing skills so that the person being coached is able to deal more effectively with similar situations in the future. This is part of building organizational capability over time. Coaching services should be in-person when possible, but can also be done on the telephone, through chat-sessions, via email, etc.

Coaching Skills

(Product: PMOStep Project Management Office Framework)

Coaching skills can be learned, assuming a person has good experiences to begin with and has good communication skills. Some general points about coaching are as follows:

- *Maintain high energy.* The sessions can be mentally draining, and the coach needs to continue to engage the project manager for the knowledge transfer to take hold. If the coaching sessions are dull, the project manager will lose interest and will have a hard time retaining the information.

- *Be conscious of the person's body language.* It takes concentration and energy to provide coaching, but it also takes energy and focus to receive coaching. If you see the person is starting to drag and his or her energy level is starting to get low, you should probably take a break. Also keep in mind that if the coach starts to drag, then the person being coached is likewise going to drag.

  Sometimes the body language or facial expression of the person being coached can lead you to believe that he or she is not receptive to your message or that he or she doesn't find the value in it. If you perceive this, make sure you also do a reality check. Ask the person if he or she understands what you are saying and whether he or she thinks there will be value in the processes on his or her project. If he or she has any objections, discuss them now so that they can be addressed as soon as possible.

- *Validate understanding.* Make sure that you do not spend too much time talking without validating that the person being coached understands what you are saying. If the person repeats back to you what you are saying, then the chances are that he or she is still mentally engaged. If he or she doesn't say anything for a while, then it could mean that he or she has lost interest or else has lost your message. If you find yourself talking a lot, stop at various times and ask the person to repeat back the information in his or her own words, or perhaps ask him or her how the information you are providing would apply to his or her project.

- *Keep notes.* As you are coaching, write notes so that the information can be referenced later. If you are coaching as a part of a working session, use flipcharts to document the relevant content.

- *Leverage personal experiences.* Use personal examples, including experience from coaching previous projects, during the coaching sessions, especially those that may be applicable to the project and its approach.

- *Ask probing questions.* The coach needs to be careful not to dominate the coaching session and do all of the talking. The coaching experience should be give and take. The coach should ask probing questions to find out additional information and draw out the participants. This includes finding out more about the project and how the project manager or project team will utilize the information that has been discussed.

Code Reviews

(Product: LifecycleStep Project Lifecycle Process)

A code review allows one or more knowledgeable third parties to walk through program written by another person. Since the owner of the code takes special pride in the techniques and logic used, this can be a difficult process for him or her to go through. However, assuming that everyone goes into the review with an open mind, and that the comments are constructive, a code review can save time in the overall construction and testing process.

The format of a code review is for the owner to walk through the different sections of the program code and explain what the program is doing to one or more reviewers. These reviewers, in turn, challenge the logic and techniques used, and look for flaws or errors in the program logic. Although the process can be very tedious, the owner and the reviewers should have the knowledge and skills required to validate that the program code looks reasonable and free from obvious errors. Any errors that are uncovered can be fixed at this time, which will save countless effort hours compared to finding the errors later in the testing process or after the solution goes live.

Conceptual Systems Design

(Product: LifecycleStep Project Lifecycle Process)

In the Analysis Phase, a Conceptual Systems Design is completed to aid in the transition from the business requirements to the technical design of the system. The Conceptual Systems Design includes items such as a high-level technical architecture, screen layouts, report layouts, and interfaces. These are all elements of the technical solution, but they also all require client input. The Conceptual Systems Design is the way to gather this detailed client feedback before the solution is turned over to the technical staff for detailed design and construction.

Constraints

(Product: TenStep Project Management Process)

Constraints are limitations that are outside the control of the project team and need to be managed around. They are not necessarily problems and they are not necessarily even risks. However, the project manager should be aware of constraints because they are limitations that the project must execute within. Date constraints, for instance, imply that certain events (perhaps the end of the project) must occur by certain dates. Resources are almost always a constraint since they are not available in an unlimited supply. Once your project budget is set, it also becomes a constraint that the project must live within.

Construct Phase

(Product: LifecycleStep Project Lifecycle Process)

Depending on your point of view, the Construct Phase is where the "rubber meets the road." This is the point in the project when you actually start to construct the solution. In an IT development project, this is the time to start writing program code. There are some additional activities in the Construct Phase that are not directly related to programming. The initial unit testing is considered as a part of Construct. Even if you have a separate group that will do the detailed testing, the original people constructing each component should also make sure that the component passes a simple unit test. Unit testing validates that the component appears to meet the minimum requirements for features and functionality and does not contain any known and obvious bugs.

The Construct Phase is also where you will create support documentation such as a Disaster Recovery Manual and User's Manual. In essence, these documents are also being "constructed," and so the logical place to create them is the Construction Phase. Depending on the type of document, the support material can also be tested in the Test Phase and then executed or implemented in the Implementation Phase.

Lastly, there is some construction work going on that is not directly related to the solution, but is related to the needs of the lifecycle. For instance, you may need to construct some components to assist in the testing process. It is also likely that you will need some custom programs written to support the data conversion requirements. You may also need to create training content.

Cost Account

(Product: TenStep Project Management Process)

Many projects have one overall budget that includes all of the project labor costs, hardware/software costs, materials costs, etc. This is fine for smaller and medium sized projects. However, as a project gets larger, it helps to have the overall budget broken down

into smaller subsets. This is similar to the concept of breaking down a project with long duration into a set of smaller projects. Having your budget allocated at a lower level allows you to keep better control of the details, and it may point out potential budget trouble more quickly than having everything rolled up into one consolidated project budget.

Cost accounts are used to allocate the budget at a lower level. Cost accounts are formally established in your organization's General Ledger so that your budget is actually allocated in each detailed cost account and the actual project expenses are reported at that level as well.

The cost accounts can be established a couple ways. One way is to simply divide the different types of costs in separate cost account budgets. In this approach, you could have a cost account for internal labor charges, external labor charges, hardware costs, software costs, training costs, travel costs, etc.

Another way to set up the cost accounts is by allocating the overall budget based on groups of related work. After you have completed the WBS, you can create cost accounts. Theoretically you could set up a cost account for each activity, but that does not make practical sense. Instead, you may set up a separate cost account and budget for each phase, stage or milestone. (A milestone represents the completion of one or more deliverables.)

Again, if you set up cost accounts for related sets of work, you have a couple of choices as to what budget gets tracked. You could just track the labor costs (internal and external) associated with the work. Another option is to track all of the labor and non-labor costs associated with that work. The various types of costs can be tracked with sub account numbers within the cost account. Of course, the more detailed your cost accounts are, the more work you will have setting up, allocating and tracking the cost account budgets. However, if your project is very large and costly, you definitely want to utilize some aspects of this technique. In very large projects, the individual cost account budgets might still be larger than the entire project budgets in some organizations.

Cost - Benefit Analysis

(Product: PortfolioStep Portfolio Management Framework)

This is a simple model and could be the starting point for determining whether a project makes sense. You create an estimate of the cost of a project and an estimate of the business benefit, and compare the two to decide whether the project is worth doing or not. If the benefit is greater than the cost, then you are initially in good shape. In many instances, the costs are one-time, but the benefits are repeating. For instance, a project may cost $50,000, and may result in additional profit of $20,000 per year. In the first year, the cost exceeds the benefit. The same is true in the second year. It is not until the third year that the cumulative benefit exceeds the initial costs. So, over three years, there is a positive cost/benefit. Your organization would need to decide if that financial performance was good enough. Your company may decide that the financial payback must be achieved over two years. In that case, this particular project probably would not be funded. A cost – benefit analysis is a simple way to look at the value of projects. More sophisticated techniques include Return on Investment (ROI) and Economic Value Add (EVA).

Cost Performance Index (CPI) (Earned Value)

(Product: TenStep Project Management Process)

This is the ratio of taking the EV (EARNED VALUE) / AC (ACTUAL COST). This shows the relationship between the Earned Value and the actual cost of the work that was performed. It gives the burn rate for the project. If the calculation is less than 1.0, the project is burning budget faster than it is completing the corresponding work.

Cost Variance (CV) (Earned Value)

(Product: TenStep Project Management Process)

The Cost Variance gives you a sense for how you are doing against the budget, and is calculated as EV (EARNED VALUE) – AC (ACTUAL COST). If the Cost Variance is positive, it means that the budgeted cost to perform the work was more than what was actually spent for the same amount of work. This means that you are fine from a budget perspective. If the CV is negative, you may be overbudget at this point.

Critical Path

(Product: TenStep Project Management Process)

Critical path refers to the sequence of activities that must be completed on schedule for the entire project to be completed on schedule. If the end date for the project has slipped, it is because at least one activity on the critical path did not complete on time. It is important to understand the critical path sequence to know where you have flexibility and where you do not. You may have a whole series of activities that end up running late, yet the overall

project will still complete on time, since the late activities are off the critical path. On the other hand, if your project is falling behind, placing additional resources on activities that are off the critical path will not result in the overall project completing any earlier.

Critical Success Factors

(Product: PMOStep Project Management Office Framework and PortfolioStep Portfolio Management Framework)

Critical success factors (CSF) indicate something very important to measure as it relates to the success of your business. The general idea is that your organization will not successfully achieve its objectives unless these CSFs are met. A CSF usually has to do with the characteristics of a deliverable. For example, you may have a CSF associated with reducing the number of defects in one of your products.

Cross Training

(Product: SupportStep Application Support Framework)

Cross training refers to the time spent working with another person to understand specific support requirements and the support environment. Cross training can occur between people in the support staff or between the support staff and the client. This is not the same as formal training. Formal training usually involves a formal instructor and a classroom setting. Cross training usually occurs more informally between peers. Training is usually held for the benefit of the trainee, and so is classified as overhead. Cross-training takes place for the direct or indirect benefit of the client, and so is considered to be a part of support. Cross training is normally performed when training a new backup to become more familiar with a primary support role.

Culture

(Product: PMOStep Project Management Office Framework and PortfolioStep Portfolio Management Framework)

Culture basically describes "how you do things around here." Culture describes the formal and informal rules that govern how you act, how you interact with others, how you get your work done, what things are valued, etc. Understanding your current culture is important. Every organization has a culture, and some of the characteristics may have been documented before. If you do not have a description of your culture, try to gain a consensus with a group of people providing input. Understanding your organizational culture can help you understand the enablers and barriers that you will need to take into account to be successful.

Current State Assessment

(Product: PortfolioStep Portfolio Management Framework)

A Current State Assessment describes how your organization functions and behaves today. This includes describing current processes, roles, responsibilities, skill levels, culture, principles, etc. Normally a Current State Assessment is not prepared in isolation. Instead, it is created before a Future State Vision is described. Once you know where you want to be (Future State) and where you actually are today (Current State) you can determine the distance between the two (Gap Analysis) and get a sense for how much work is required to get from where you are today to where you want to be in the future.

Customer

(Product: TenStep Project Management Process)

A customer is the person or group that is the direct beneficiary of a project or service or the people for whom the project is being undertaken. (Indirect beneficiaries are probably stakeholders.) In many organizations a "customer" is the same as a "client". However, some organizations differentiate between the two roles by referring to internal groups as clients and external groups as customers.

Dashboards

(Product: PortfolioStep Portfolio Management Framework)

You may hear the term "dashboard" to refer to the consolidated status report that is provided to your management team. The concept of a dashboard comes from your automobile dashboard, where all of the critical information on your car's status is displayed. On a car, this includes how fast you are going, the miles you have driven, your engine temperature, fuel availability, etc.

An organization dashboard is similar. You start with the consolidated status information and roll-up organization metrics. Rather than report all of the details, you create a set of graphs, tables and charts that show the overall status and health of the organization and projects. Examples of this type of information could include a red/yellow/green status indicator on all projects, a graph showing estimated budget versus actual expenditures, charts showing summarized client satisfaction metrics, etc. The dashboard allows a more visual view of the project status and organizational metrics. Many dashboards allow you to click on each graph and chart to see the detailed metrics that make up the total.

Data, Structured and Unstructured

(Product: TenStep Project Management Process)

Data can be stored in one of two states – structured and unstructured. Structured data refers to information that is stored in a repetitive and organized format. Structured data refers to files, tables, databases, data warehouses, etc. This type of data is easily stored and accessed by computer programs.

On the other hand, unstructured data is typically in a format that is easier for a human being to understand. Unstructured data includes documents, images, graphics, video, audio, etc. Unstructured data can be increasingly manipulated by a computer, but the basic understanding of the base content is still best performed by people.

The following chart provides an overview of some of the characteristics and differences between structured and unstructured data.

Structured Data	Unstructured Data
Fields, records, files, tables	**Documents, pictures, graphics, text, video, chat**
Code, models, scripts	
Rely on tools, databases	**Difficult to find tools, although more exist today**
Source code management tools	**Document management tools**
Hard to organize without tools or structures	**Can organize without tools**

Data Analyst/Architect

(Product: LifecycleStep Project Lifecycle Process)

Large projects typically have a specialist called a Data Analyst (DA) that works on designing the datastores. (In some organizations, this person is called a Data Architect.) This contrasts to the role of a Database Administrator that works on the physical datastores. The Data Analyst is a person with in-depth and specialized knowledge in designing tables and databases so that they strictly meet the business requirements, but are also as efficient as possible. The DA may be involved in the project during the Analysis Phase by gathering data requirements and putting together the data models. A DA must first ensure that the data relationships are complete and correct. If they are not, there will be problems implementing the physical datastores and there may be errors introduced by misapplying the manner in which data elements relate to each other.

In addition to making sure that the data elements relate correctly, the DA also tries to ensure that the logical design is as efficient as possible. In some cases, the DA might find himself or herself designing a perfect solution in terms of pure data relationships. However, the design may be unworkable or inefficient to actually implement. In some larger organizations, a separate role of the Database Administrator (DBA) (or the developer in the Construct Phase) has the job to make changes to the logical design so that it will work more efficiently

in the real world. However, the goal of the logical design should be that the logical design can be implemented as-is in the actual physical datastore.

Data Conversion

(Product: LifecycleStep Project Lifecycle Process)

Data conversion refers to work required to change data from one format to another.

The purpose of data conversion is to take existing manual and automated data and change it into a format that can be used by the new or modified solution. Data conversion has a mini lifecycle of its own. In other words, the planning and preparation for data conversion needs to be started up-front in the lifecycle. If you have not thought about data conversion until the Implementation Phase, you are going to be in trouble.

The actual data conversion is almost always done during the Implementation Phase. However, this implies that the conversion has been planned ahead of time. The key to effective data conversion, as it is with other aspects of the project life-cycle, is to start the planning process early. Depending on the size and complexity of your project and your data conversion needs, you may have developed an overall Data Conversion Strategy during the Analysis Phase of the project. During the Design Phase, you should have developed your Data Conversion Plan, taking into account your overall conversion strategy if you have one. Your data conversion may require you to build custom programs to convert the old data to the new format. In some cases you might use a data mapping tool. This work should be completed during the Construct Phase. Similarly, you will want to test your data conversion during the Test Phase. In many cases, you will need to run the conversion programs to build the data for your System Tests and User Acceptance Tests. You should notice that this lifecycle approach to data conversion reduces the chance that the data conversion will be rushed. Assuming you followed the prior steps, at the end of the project, you should have planned (and perhaps even tested) your data conversion process, and you should be ready for the live conversion event.

The timing of the data conversion will depend on the project and will be dictated by your Data Conversion Plan. On some projects, the data conversion is straightforward and can be accomplished just as the solution is being moved into production. On other projects, the data conversion can be complex and take a number of days to complete. In still other cases, the data conversion may be a significant effort in itself and may be split off into its own project. For instance, if only portions of the database can be loaded at one time or if there are portions of data that come from multiple sources, many conversions may be required. These conversions might require complex, custom programs to complete.

Once the conversion is complete, care must be taken to ensure that the process worked as expected. This validation process can also be complex and too cumbersome to do manually. Again, custom programs may need to be written to check on the validity of the converted data. A common technique, for instance, is to count records and rows, and sum up counts

and amounts. Then, after the conversion, records and rows, and counts and amounts are again summed to ensure that all of the data balances as expected. The users that have business knowledge in how the data should look are especially valuable in ensuring that the converted data looks appropriate as well.

Data Dictionary

(Product: LifecycleStep Project Lifecycle Process)

The data model created in the Analysis Phase is the source for a data dictionary that is defined for the datastores. The data dictionary contains metadata, or "data about the data". In other words, the data dictionary defines and describes each data element, each interim and calculated element, each row, each table, each key, etc. Depending on the technology you are using, the data dictionary can be started in the Analysis Phase and further updated in the Design Phase. Information in the data dictionary includes:

- *Element name*

- *Element description / definition*

- *Attributes* such as the length and type of data

- *Synonyms* or other names by which this entity is known. This is helpful if other solutions already exist that reference this element by other names.

- *How the entity is derived.* This is used for interim values, calculated elements or entities made from a combination of other entities.

- *Edits* that are made before the data values are stored. For instance, some elements cannot be blank, or must be greater than zero, or must be numeric.

Data Flow Diagram

(Product: LifecycleStep Project Lifecycle Process)

A data flow diagram shows logical relationships between data at a high level. In a data flow diagram, the data is rolled up into the common data store (database, table, file, or data warehouse, for example). The diagram shows high-level processes and is meant to highlight the movement of data from one process to another. The diagram also contains references to external data stores that are used by the process.

Data Models

(Product: LifecycleStep Project Lifecycle Process)

In addition to process modeling, there is another type of modeling that may be needed on large, complex projects – data modeling.

Years ago on the mainframe, there were flat files and databases (okay, there were VSAM files too). Flat files were under the control of the programmer, and they could be created at will. Databases, however, were too complex for mere programmers to understand and manipulate. They required Data Analysts (DA's) and Data Base Administrators (DBA's). Data Analysts would work with you to logically model the data, and then the DBA's would implement the resulting model in a physical database.

In today's client/server and web development environments, the databases are much more within the control of the developers. SQL*Server and Oracle databases in use at many companies do not require database specialists, and the developers do the database design work themselves.

There are two fundamental purposes for formal data modeling. First, it provides a precise language and syntax to represent the relationships between data entities. All the important data utilized by the company can be represented this way. As an example, think of whether it would be difficult for your company to agree on the precise definition of a customer? It may take months to define what a customer is, agree on the common attributes, and gain a common understanding of how the customer related with various other entities. However, from that point on, everyone could rally around the common definition.

The other important aspect to data modeling is that it is used to define entities and relationships in ways that can be used to store the underlying business data. This leads to defining files and databases in a way that will allow business applications to process the information correctly. As an example, you may discover that many customer attributes are relatively static. You may also realize that one customer may generate many orders. These simple facts allow you to create two database tables – one to hold the customer attributes and one to hold order information. Each can be keyed on a common customer number. This saves storage space, allows for faster processing and makes the data easier to maintain.

There are two components of a data model. The first is the Entity Relationship Diagram that shows the relationship of the data elements in picture form. The second is a data dictionary that shows fundamental characteristics of each data element in words. The data dictionary can include information such as a description of the element, how it is created, what applications use it, what databases and tables the field is in, synonyms for the element name, etc.

Decision Tree

(Product: TenStep Project Management Process)

One way to calculate the financial results of an interdependency of risk is to use a decision tree. A decision tree is a technique for determining the overall risk associated with a series of related risks. Decision trees are a good technique when you have the following characteristics:

- Risk probabilities of one risk are based on the results of a prior risk. That is, the risks are sequential.

- The decisions are either/or, or there are a small number of probable results for each decision point – not an infinite number.

- There are monetary implications of the risk calculations.

Deliverable

(Product: TenStep Project Management Process)

A deliverable is product, service, or result that is produced by a project. These can be documents, plans, computer systems, buildings, aircraft, etc. Internal deliverables are produced as a consequence of executing the project and are usually only needed by the project team. External deliverables are those that are created for clients and stakeholders.

Deliverable Review

(Product: TenStep Project Management Process)

Deliverable reviews, or walkthroughs, can be applied to many deliverables produced by the project. For example, the project schedule could go through a deliverable review. Project business requirements can be reviewed. You can walkthrough program code, marketing campaigns and research papers. Deliverables that require human knowledge and creativity can be reviewed. However, you cannot hold a walkthrough for tangible deliverables such as a new computer, aircraft components, automobiles or clothing. There are other techniques, like inspections, to validate these types of deliverables.

A deliverable review allows one or more knowledgeable third parties to walk through a deliverable created by another person. Assuming that everyone goes into the review with an open mind, and that the comments are constructive, a review can save time in the overall development of the deliverable.

The format of a review is for the owner to walk through the different sections of the deliverable and explain the meaning to the reviewers. These reviewers, in turn, challenge the deliverable content and look for flaws or errors in the program logic. Although the process can be very tedious, the owner and the reviewers should have the knowledge and skills

required to validate that the deliverable looks reasonable and free from obvious errors. Any errors that are uncovered can be fixed at this time, which will save countless effort hours compared to finding the errors later in the project.

Dependencies - Mandatory and Discretionary

(Product: TenStep Project Management Process)

When you map out the relationship between all of the activities you will notice that some of the activities have a firm dependency and others have a soft dependency. In many cases one activity <u>must</u> follow another activity. This is a mandatory dependency. However, in other cases you will find that certain activities need to be done in a general timeframe and you have options on when to actually schedule the work. You have to tie the activity to some activity (or activities) before it. This would be a discretionary dependency since you have some discretion on when the activity is done. It is important to know the difference. It is possible that you may have some flexibility in your end date if you have some discretionary dependencies on the critical path. Knowing the difference may also help you if your project gets behind schedule. You may find that changing some of these discretionary dependencies will help you accelerate the schedule if it looks like you will exceed your deadline.

Design

(Product: LifecycleStep Project Lifecycle Process)

A design is a clear specification for the structure, organization, appearance, etc. of a deliverable. A design describes the deliverable with enough technical detail that the deliverable can be easily built in the next step.

Designer

(Product: LifecycleStep Project Lifecycle Process)

The Designer is responsible for understanding the business requirements and designing a solution that will meet the business needs. There are many potential solutions that will meet the client's needs. The Designer determines the best approach. A Designer typically needs to understand how technology can be used to create this optimum solution for the client. The Designer determines the overall model and framework for the solution, down to the level of designing screens, reports, programs and other components. He or she also determines the data needs. The work of the Designer is then handed off to the programmers and other people who will construct the solution based on the design specifications.

Development

(Product: LifecycleStep Project Lifecycle Process)

Development is the term given to the type of work that is done to build software applications. Development does not just include coding. Development covers the entire systems development lifecycle, including analysis, design, construct, test, implement and then long-term support. (Support is sometimes referred to as "maintenance" but it still falls under the generic term of "development".)

Disaster Recovery (General)

(Product: LifecycleStep Project Lifecycle Process)

Disaster recovery is a term used to describe the ability to restore your critical business processes in the event of a disaster. It is a specific IT portion of a more general process called Business Continuity Planning, which ensures that the entire business can continue in the case of a disaster. Disasters are always possible. Years ago, you might have pretended that a nuclear bomb exploded on the company headquarters. With the end of the cold war, the disasters turned to the more mundane, but real, possibilities of fires or floods. Depending on the part of the country you work in, a disaster scenario might include an earthquake. More recently, the possibility of a terrorist strike might be the cause for declaring a disaster.

Disaster Recovery (Applications)

(Product: SupportStep Application Support Framework)

Being able to recover critical business applications in the event of a disaster requires a coordinated effort from operations, development, and the business users. The operations staff may be backing up the servers, but they do not understand the business data, what it means and how it fits together. In fact, they don't care – it is all just bits to them. The staff members responsible for supporting the applications need to care. They have been entrusted with the IT responsibility for the application and must ensure that it can be recovered fully in case of a disaster. Remember - operations will recover the data and the infrastructure, but the application support staff needs to recover the fully functioning application. The process used to recover the application is described in the Disaster Recovery Plan.

Disaster Recovery Testing (Applications)

(Product: SupportStep Application Support Framework)

There are many physical and natural threats to a computer environment. Even though your application may have a high degree of security built in, it may still be susceptible to a disaster that affects your entire environment. These vulnerabilities range from terrorist threats (especially for data centers in certain parts of the world) to floods to fires to computer viruses to malicious damage caused by employees. You could ask what would happen to your shiny new application if a fire destroyed the computer center. You may have implemented storage replication technology or have information on system tapes, but can your application be recovered successfully as well? Disaster recovery testing is designed to see whether your application can be recovered successfully in an alternate environment. The procedures you establish will be the basis for periodic disaster recovery testing throughout the life of the system. The things you want to test for include:

- Ensuring that the environment and operating systems can be recovered in a reasonable time period.

- Validating that all solution databases and files are backed and recoverable at a consistent point in time

- Validating that you can restore applications (and data) to a specific point in time.

- Test that your security is still in place in the recovery environment. For instance, there may be server-specific certificates that will not work on the recovery servers.

- Test your disaster recovery documentation. Make sure that there is sufficient information for a third party to recover the solution. Remember that you may not be involved in or available for the recovery, and another person may need to recover the system based on the written instructions.

- Validate that databases and files from other applications or vendors can also be recovered and that they can be synched up with the rest of your system.

Obviously, this is a specialized test, and it is a type of insurance in case a disaster hits. If it is absolutely critical that your application be available, you probably want to do a form of this test, even if it is simulated instead of a live recovery. If you do not have the right duplicate facility for the disaster recovery testing (you may have a live disaster facility but not one you can use for testing), you may need to do a table-top exercise and get the team together to see if you think you have what you need for recovery.

Discovery Project

(Product: TenStep Project Management Process)

Without the proper structure, there is a tendency for the up-front project definition work on a large project to become very lengthy and unfocused. Defining the work for very large projects takes enough time that it should be structured as a project itself. This is the purpose of defining a separate Discovery Project.

A Discovery Project is a project whose purpose is to plan and define a subsequent very large project. This should make sense. If the project is ultimately going to take 50,000 effort hours, it may take a number of months to get the project defined and approved. In these cases, a distinct first project is established to define the second larger project itself. The final deliverable for a Discovery Project is a completed Project Charter, Project Management Procedures and project schedule for the subsequent large project. For the most part, all the other deliverables will be produced as a part of the next follow-on project.

Discretionary Work

(Product: PortfolioStep Portfolio Management Framework)

This term describes all of the work that can be prioritized on a backlog. In some organizations, this type of work can be called "enhancement;" however, this term is too confining. Discretionary work can include enhancements, but it can also include some work

that you might traditionally think of as support-related. The key to "discretionary" work is that it is subject to prioritization, and by implication, if the priority is not high enough, the work can be delayed until later. In fact, you may have the resources to complete the work immediately. However, the question is whether the work can be subject to prioritization. If it is too critical to be prioritized - that is, if it must be performed now - then it would fall into the "support" category.

From a portfolio perspective, you don't want to be in a position where you are subjecting each discretionary request to the same level of scrutiny that projects face. There are simply too many enhancements, they are too small, and they cannot necessarily be planned ahead of time in the Business Planning Process. However, you do want to account for discretionary work in your portfolio. Therefore, you can establish a blanket work budget for discretionary activities, and you can include the work at a summary level in the portfolio. In the IT organization, you could create one large budget to cover all discretionary work from all the client organizations, or you can establish a discretionary budget for each client organization. For instance, you can designate budgets for "Finance discretionary," "Marketing discretionary," "IT discretionary," etc.

Documentation Testing

(Product: TenStep Project Management Process)

Many people have experienced frustration after they buy something that needs assembly, only to find that the instructions are vague or wrong. Given that common experience, the project team needs to be sensitive to making sure that the documentation provided is understandable and complete. In some cases, the documentation of the solution is done by the project team, and in some instances it is done by the client organization. However, all of the available documentation can be "tested" regardless of where it was produced.

The purpose of documentation testing is to thoroughly review all written material that will be a part of the final solution. In other words, you want to review the User's Manual, the Application Maintenance Manual, the Disaster Recovery Manual, etc. However, you do not need to review project documents like the Business Requirements Report or Status Reports. The testing can be done a couple of different ways.

- Ask people who are unfamiliar with the application to follow all documented procedures. These should be written in a way that provides step-by-step guidance on how to accomplish the given task. If the testers cannot successfully complete the procedures, the procedures need to be improved.

- Get people who have strong English, punctuation, and grammar skills to review all the material for professionalism and readability. It would be great to utilize experienced proofreaders. Otherwise, use employees with strong written communication skills.

- Try out all alternative ways that are documented to accomplish a task. In many cases, the primary way works, but the alternatives do not.

- If you are describing policies or standards, make sure that the appropriate authorities in your organization review and approve your wording. You do not want to misquote or misapply an important company policy.

- Evaluate any manual forms, checklists, and templates to ensure they are accurate and that the appropriate information is being collected.

If you have the right people identified for this test, and you go over all the manual documentation thoroughly, you will reduce or eliminate a source of frustration and resistance after the application is implemented.

Domain Modeling

(Product: LifecycleStep Project Lifecycle Process)

Domain modeling is used for process modeling at a high level. Rather than showing steps in a process, a domain model shows relationships between organizations, products, major events, major data stores, etc. Major business processes are shown, such as Billing, Inventory, Sales Order, etc., rather than the detailed activities that make up each of these processes. This type of process modeling is used to show the major processes and interactions between organizations, or even between the entire company, suppliers, and the marketplace.

"Don't Shoot the Messenger"

(Product: TenStep Project Management Process)

You have all heard this saying (or something similar). It means that you do not take retribution against the person (or people) that deliver bad news. If you ask people for a status, accept the good and the bad for what it is – information for you to make better decisions. If you want people to tell you when there are problems, you need to accept the information and work with the team on causes and solutions. (Hopefully the team member is proposing solutions along with the problem.)

All project managers need to take this message to heart. They want to hear bad news as quickly as possible to have a chance to respond quickly. Issues and risks that are surfaced early allow for much more flexibility in the response. You have much less flexibility to operate if you hear about them at the last minute. However, if people bring bad news to you and you respond negatively toward the person bringing the news, it will make it much harder for other "messengers" to come forward with bad news in the future.

Draft Copies

(Product: TenStep Project Management Process)

Draft copies are documents that have been initially completed by the author, but are not yet ready to be considered entirely complete. In most cases, this is because the document is in some kind of review process. Draft copies of documents could be stored in the author's workarea. However, for large projects, or ones where more rigor in document management is needed, it will make sense to maintain a library or folder for draft copies. In this case, the update process would look as follows:

1. A document is created and edited in the author's workarea.

2. After the initial draft is completed, the document is moved from the workarea to the draft library. The document stays there until the author needs to update it or it is ready to be moved to the repository as an approved document.

3. When the document is in the draft library, it can be circulated for review and input

4. If the draft copy needs to be updated again, the document is copied back to the workarea for updating, leaving a copy in the draft library.

5. This process is repeated until the document is totally complete. Then the document can be moved from the draft library to its final location in the document repository.

The value in this approach is that the project team always has one official draft of each document and only one live, approved version as well.

Earned Value (EV)

(Product: TenStep Project Management Process)

Earned value is a way of measuring progress.

In the 1960's, the US Department of Defense began to mandate the use of earned value on defense related projects. As you might expect, if the government is contracting out projects worth hundreds of millions, or billions, of dollars, they want project progress updates to consist of more than "we seem to be on target." Earned value calculations can provide a better sense for exactly where the project is against the baseline and provide an early warning if the trends indicate that the project will be overbudget or over its deadline.

The logic behind earned value is as follows. There is value associated with completing work on a project. With earned value, you are earning the value of the project on an incremental scale as the project is executing. For instance, when 50% of the work is completed, you could say that 50% of the value of the project has been realized as well.

The general idea behind earned value is to compare where you actually are against where you planned to be. Let's refine this idea a bit further. Let's say you are currently working on activities numbered 49, 87, 88, 100 and 108 in your project schedule and that all of the dependent activities in front of them have been completed. Since these activities are spread out in various portions of the project schedule, it may be hard for the project manager to tell exactly where the project stands in terms of schedule and budget. Earned value allows you to

quantify all of the work that has been accomplished so far on the project. It also allows you to quantify all of the work that should have been done on the project so far. Then, you can compare the work that <u>has</u> been done against the work that <u>should have been done</u> to determine if you are on schedule, ahead of schedule or behind schedule.

Likewise, given where you are today, earned value calculations allow you to determine the total cost of the work done so far, as well as the total cost of all the work you expected to have completed by now. Comparing these two numbers gives you a sense for whether you are trending overbudget, under budget or on budget.

Utilizing both the schedule and cost metrics gives you more information as well. You may well be spending your budget faster than you anticipated, but what if the reason is because you are ahead of schedule as well? That is, you may be spending more because your team may be getting more work done than planned. That may be fine. Likewise, if your project is behind schedule, but you are also behind in your spending, that may be fine as well. Perhaps you were not able to get the team members allocated as fast as you planned. So, your project is behind schedule, as is your spending rate. If you have a critical end date, this may be a problem. If your end date is a little flexible, you may be fine as long as you don't overspend your budget.

Earned value gives you the information you need to make the right decisions.

There are two ways to define the term "earned value". First, earned value is used to define the entire concept around understanding where you are at on your project that is described above. Often this is referred to as Earned Value Management. In addition, the term Earned Value (EV) is also used to define a specific variable. In this definition, Earned Value is calculated by adding up the budgeted cost of every activity that has been completed. (Remember, this is not the actual cost of the work activities. This is the <u>budgeted</u> cost.) EV is the basic measure of how much value the project has achieved so far. By itself, it does not tell you too much. So, we use it in combination with other calculations to determine your status.

Economic Value Added (EVA)

(Product: PortfolioStep Portfolio Management Framework)

One of the problems with Return on Investment (ROI) is that it can assume that the use of the money for your project is free. That is, you are assuming that the company has project funding available and that if you were not using it, it would just be laying around. Of course, you know that is not the case. First of all, your company may well have to borrow funding for projects, and that interest rate needs to be factored into the equation. It would not make sense, for instance, to borrow money at an 8% interest rate, and then use it on a project where the ROI was 6%.

In fact, the company may or may not have the money on hand. However, for the purposes of project funding, you could assume that even if your company has the money, they are lending it to your project, and that may force borrowing somewhere else. Economic Value Added (EVA) takes the cost of the funding capital into account. Your project will have a lower ROI, then, after you account for the "cost of capital."

Estimating Techniques

(Product: TenStep Project Management Process)

The following techniques can be used at a project level or activity level, or for any sized work in-between. For instance, an expert opinion can be used to help guide the estimate for an entire project or a specific piece of work. The high-level estimates are typically referred to as top-down techniques. Top-down techniques include prior history, analogy and ratio. Overall estimates that rely on a more thorough breakdown of the work are called bottom-up. The WBS technique, for example, is a bottom-up technique.

Top-down estimates are typically quicker and easier to put together. They are usually less precise as well, except for estimates based on previous history and analogy on similar projects. If possible, you should utilize multiple estimating techniques for a project, especially if you are using a quick top-down technique.

- **Previous History.** This is by far the best way to estimate work. If your organization keeps track of actual effort hours from previous projects, you may have information that will help you estimate new work. In this method, the characteristics of the prior work, along with the actual effort hours, would be saved in a database or other medium that could be searched for new projects. A person that is estimating new work could describe the characteristics of their project to see if similar work was done in the past. If so, he or she could review prior results to get a good idea of the effort required to do the new work.

- **Analogy.** Even if you do not keep actual effort hours from previous projects, you may still be able to leverage previous work. Analogy means that you are looking for similar projects, even if they do not have the exact same characteristics as your project. If you have a historical database, that would still be the first place to look. Otherwise you can describe your new work and try to determine whether any similar work was done in the past. You may be able to find out about similar projects by sending an email to appropriate department managers.

  If you find a match, you can talk to the project manager on the prior project to determine how many effort hours the project used, and utilize the information for your estimate. If the prior project team did not track actual effort hours, you may still be able to obtain some estimating help. The prior project manager should have at least had an

original estimate of effort and duration. Although he or she did not track the actual effort hours, he or she should know the actual duration. If the actual duration hit the estimated duration, you may be able to assume that the effort hours were close as well. On the other hand, if the project ended with a 20% overage in duration, you may be able to estimate that the effort hours were 20% over as well. For example, let's say a prior project was estimated to take six months and 2000 hours to complete. If the project actually was completed in six months, there is a good likelihood that the project also took approximately 2000 hours of effort.

- **Ratio**. Ratio is similar to analogy except that you have some basis for comparing work that has similar characteristics, but on a larger or smaller scale. For instance, you may find that the effort required to complete a software installation for the Miami office was 500 hours and that one of the big drivers for the effort is the number of people at the remote office. If there are twice as many people in the Chicago office, you may be able to conclude the work may take 1000 hours there.

- **Expert Opinion**. In many cases you may need to go to an internal or external expert to get help estimating the work. For instance, if this is the first time you have used a new technology, you may need the help of an outside research firm to provide estimating information. Many times these estimates are based on what other companies in the industry are experiencing. You may also have an internal expert who can help. Although this may be your first time to estimate a certain piece of work, perhaps someone else has done it many times.

- **Delphi**. The Delphi technique is similar to expert opinion, except that you use multiple experts and try to reach an estimating consensus among them. First, identify two (preferably three) or more people who you would consider to be experts in the type of work you are estimating. Next, send them the relevant information they need to understand the work. They should send you back an estimate of the effort, along with any assumptions, risks, etc. they identify.

  If the estimates are relatively close, you should feel very good about using an average of their input for your final estimate. However, you may find that the estimates are not close to each other, or that some of the estimates are close to each other but other estimates are not. If that happens, send an anonymous summary of all the estimates, including the assumptions and risks, back out to the experts for review. Ask the experts to consider the estimates, risks, assumptions, etc. of the other estimators. Then ask each of them to provide a second estimate of the work. Hopefully, you will find the various estimates closer now, since each expert has a chance to see the work of the other experts. Based on a common set of assumptions and risks, hopefully, the experts can reach a consensus estimate. If they cannot, you can see if most of the experts have a similar estimate and use that number. You may have to also note an estimating risk in the direction of the experts that were not close to the consensus. For instance, if three experts estimate work at around 1000 hours, but one expert holds to the belief that the work is 2000 hours, you may need to go with the 1000 hour consensus, with a stated risk that the numbers might be up to twice that amount, based on at least one expert opinion.

A second option if you have the time and inclination is to ask for more expert opinions. This would give you more confidence if the new expert estimates were close to your consensus number, and it would give you less confidence (and more risk) if the new estimates were not close to your consensus number.

- **Work Breakdown Structure.** Breaking down work into smaller pieces can be helpful when you are creating your project schedule, and it can also be useful as an estimating technique. You may look at a large piece of work and have difficulty estimating the effort required. However, as the work is broken into smaller pieces, the individual components will be easier to estimate. When you have estimated all the pieces, add them all together for the overall effort. If you have time to create a good WBS, you usually end up with a good estimate. If you use multiple estimating techniques, one of them should be the WBS approach if possible.

- **PERT** (Program Evaluation and Review Technique). The term PERT is often used to refer to a network diagram. However, it is really the formal name of an estimating technique that uses a weighted average of three numbers to come up with a final estimate. If you are asked to estimate the effort required to complete a project or an activity, you start with three estimates - the most pessimistic (P) case when everything goes wrong, the most optimistic (O) case where everything goes right, and the most likely (M) case given normal problems and opportunities. The resulting PERT estimate is $(O + 4M + P)/6$. For example, let's say you estimate a piece of work to most likely take 10 hours. The best case (everything goes right) is 6 hours. The worst case (everything goes wrong) is 26 hours. The PERT estimate is $(6 + 4(10) + 26)/6$. The answer is $72/6$, or 12 hours. Notice that the number was pulled a little toward the far extreme of the pessimistic estimate, but not by much, since the result is still weighted heavily toward the most likely value.

- **Parametric Modeling**. In this technique, a pattern must exist in the work that allows you to use an algorithm to drive the overall estimate. For instance, if you know that you can build one mile of flat one-lane highway for one million dollars, you should be able to easily calculate an estimate for ten miles of flat four-lane highway (40 million dollars). Or, if you are asked to create 40 new reports, first estimate the effort for an 'average' report (perhaps the average of a small, medium and large report). Then multiply the average effort for a report by 40 for the final estimate.

- **Function Points**. Some IT development organizations use function points as a means to provide meaningful estimates of the work required to complete a systems development project. Function points provide a mechanism to determine the relative complexity of an application. The complexity can be expressed as a count of function points. In this way, an application of 1000 function points is generally ten times larger and more complex than an application of 100 function points.

  Without getting into a lot of detail, function points look at the size of an application from a user perspective. The users see reports, screens, and maybe data files. They also see business functionality, interfaces to other applications, databases, tables, etc. It makes sense that an application with 80 screens and 20 reports is probably larger than an application with 20 screens and 5 reports. This way of looking at size is independent of the underlying technology and development language. In fact, the application with the

smaller number of screens might require more lines of code, but that is no longer relevant in the sizing calculations.

You cannot do function point estimates early in the planning process. However, once you know the number of screens, reports, interface files, transactions, etc., you can create a high-level estimate of total function points. Once you have been counting function points for a few projects, you will start to see the average effort required to complete one function point. After that, it is just a matter of applying the math to determine the total effort required, followed by the duration and the cost.

Estimating Threshold

(Product: TenStep Project Management Process)

When you create a schedule you generally don't know enough to enter all of the detailed activities the first time though. Instead, you identify large chunks of work first, and then break the larger chunks into smaller pieces. These smaller pieces are, in turn, broken down into still smaller and more discrete activities. This technique is referred to as creating a Work Breakdown Structure (WBS).

An appropriate question to ask is how small the activities should be before they do not need to be broken down further. This is referred to as your "estimating threshold". Work can be broken down into smaller activities than the estimating threshold, but normally no work would be left at a higher level. The threshold can be different based on the size of your project and how well the work is understood.

Evaluation

(Product: PortfolioStep Portfolio Management Framework)

The Evaluation Step in a portfolio management process is where all of the potential work is surfaced for the coming year. At this point, each request should have a simple Value Proposition document that describes the work and the value that it will provide to the organization. The Value Proposition will also show alignment with the overall organization strategy and goals. If your portfolio includes all possible work, the Value Propositions will include projects, support, discretionary and leadership work.

Facilitated Session

(Product: LifecycleStep Project Lifecycle Process)

A facilitated session is used when you are trying to gather requirements from many people who may or may not have common roles and experiences. Facilitated sessions are used when there are too many people to hold a group interview.

As you get more and more people in a meeting, the dynamics start to change. Instead of focusing exclusively on questioning and listening, the interviewer now also spends much of his or her effort "facilitating" the meeting and making sure that the group stays on track for the common purpose of the meeting.

A facilitated session is led by a facilitator who helps guide the discussion and make it easy for everyone in the group to contribute. There are classes where people can learn formal facilitation skills, and, if possible, a facilitated session should be led by a formally trained facilitator. A good facilitator possesses strong questioning and listening skills, as well as presentation skills and the ability to help the group successfully achieve its objective for the meeting.

Part of the success of the meeting comes from the facilitator's preparation before the meeting starts. Typically, the facilitator should spend as much time preparing for the meeting as the actual meeting time itself. The facilitator also helps the group reach consensus by using good verbal and written skills. The written skills include expressing ideas on whiteboards and flipcharts so that everyone can see them and they can remain in front of people even as the discussion may go off in other directions.

Typically, facilitation is a full-time job at the meeting, so a second person must be available to be the scribe and document any agreements, open items, follow-up activities, etc. The facilitator also does not participate in the actual discussion, since he or she could use his/her central role to dominate the discussion or sway the group a certain direction.

Facilities Department

(Product: SupportStep Application Support Framework)

Your Facilities Department is typically responsible for the physical safety and security of the people and assets in the company. This includes things like making sure that spills are cleaned up to avoid injuries and conducting fire drills to make sure people know what to do in an emergency. Facilities is also responsible for having guards at the front of the building, establishing a reception area where all visitors wait, issuing badges to authorized employees and contractors, setting up badge reading equipment, etc.

False Requirements

(Product: LifecycleStep Project Lifecycle Process)

If you could ask your client what their requirements were and they responded with everything they needed, the Analysis Phase would be easy. However, that is rarely the case. In the course of the requirements gathering process, the analyst will hear statements that appear on the surface to be requirements, but really they are not. These are false requirements. False requirements come in many forms, including:

- *Vague requirements.* These are statements that contain a hint of one or more requirements; however, they are not specific enough to be considered real requirements. Vague requirements require good follow-up and probing questions to make sure you have the correct level of detail. For instance, your sponsor might tell you "I want people to say

'Wow' when they see this." This is not a requirement. The analyst must ask some follow-up questions to get more specifics.

- *Opinions.* Opinion statements can be requirements, but many times they are not. For instance, if there are multiple ways that a process could work, the client may give you their opinion on the way they think would be best. If one way is better than the others, it is fine to express an opinion. If the multiple solutions are all equally valid, then all of them should be documented as possibilities for requirements. However, if a client manager tells you that he or she thinks the company is spending too much money on the project, he/she is giving an opinion - not a requirement.

- *Project-related statements.* These are statements that describe the project – not the deliverables. For example, if a client tells you that "we should prototype this solution first," he or she is giving you input into the project approach - not a requirement. If your manager says you are "required" to complete the work within six months, he or she is giving you a project duration constraint – not a requirement.

- *Out of scope.* When you are gathering requirements, you may find that you get off on a tangent (related or unrelated to the discussion). For instance, when discussing a set of reports, the client might remark that a co-worker has a new printer and that he/she would like a similar one. This is not a requirement. It is out of scope for the purposes of the reporting discussion. On the other hand, if the type of printers available has an influence on the reports, then it could be a requirement.

- *Not the right role.* It is important to understand the role of the person giving you requirements. For example, an end user might tell you, "I think we should have a set of reports that go to our executive management staff." However, the end user is not the right person to give us that type of requirement. Likewise, a client might tell you that you should be using web technology on this project." Again, the client is not the right person to make this type of technology decision. The analyst should probe more to determine what the detailed requirements are that make the user think a web solution is appropriate.

- *Unrealistic (not testable).* You might hear requirements that are really marketing hype or extreme hyperbole. For instance, a client manager may tell you that "This product needs to be able to run on the moon." This is not a requirement since it cannot be tested or validated. The analyst should ask follow-up questions to determine the real requirements behind the statement.

Fast Track

(Product: TenStep Project Management Process)

Fast track means that you look at activities that are normally done in sequence and assign them totally or partially in parallel. For instance, imagine that you are building a home. A dependency that you face is that you cannot construct the house frame until the foundation has been laid and has dried. However, if the house is large enough, you may have options to fast track by starting to erect the frame on the side of the home where the foundation was

poured first. The foundation will harden there first, and might allow you to erect the frame on that side while the foundation on the far side of the home is still drying.

Another example involves designing an IT application. Normally you would not start constructing a solution until the design was completed. However, if you were fast-tracking, you would start constructing the solution in areas where you felt the design was pretty solid without waiting for the entire design to be completed. Fast-tracking always involves risk that could lead to increased cost and some rework later. For instance, in the example of designing and constructing an application, it's possible that the design might change before it is finalized, and those final changes may result in having to redo some of the work already underway.

A good rule of thumb is that sequential activities can sometimes be fast-tracked by up to 33%. In other words, if you are fast-tracking, you can start the second of two sequential activities when the first activity is 66% complete. There is risk involved. However, this seems to be a level of fast-tracking risk that is normally acceptable.

Float (also referred to as Slack)

Float, or slack, refers to the difference between the earliest date an activity can start and the latest date by which the activity must start for the project to complete on time. For example, let's say that Activity B could start as early as March 15, since that is when all predecessor activities are completed. However, it also turns out that Activity B can start as late as March 30 and you would still complete the project on time. This would mean that activity B has 15 days of float (also called 15 days of slack).

When you are looking at the float in your project, you may come upon three terms - free float, path float and total float. Free float is a term that is applied to individual activities. It refers to the amount of float in an activity before it delays the next activity. For example, if activity B can start up to five days after activity A completes without impacting the next activity, activity B has a free float of five days.

There is also a concept of path float, which is similar to free float, but is applied over an entire path of the project schedule. Path float is shared by all the activities on the path. If one activity uses the entire path float, there is no float remaining for the other activities on the path.

Total float refers to the total amount of float among all activities on all paths. If you have a lot of total float, then you usually have many more options as to how you allocate resources to achieve your due dates, and you have more flexibility if your project gets behind schedule. However, if total float on the project is low, you will have more schedule risk and much less flexibility. If the project starts to fall behind, you will have a harder time reallocating resources, since if another path gets delayed it may quickly turn into the critical path.

Following People Around

Most of the techniques associated with gathering requirements have to do with asking people questions and listening to the response. The question, answer and discussion format is basically used for one-on-one interviews, group interviews, facilitated sessions, JAD sessions and even questionnaires. All of these techniques require that the interviewee(s) effectively communicate the requirements and that the project team (analysts) document them correctly.

Another technique doesn't rely on this communication process. Instead, this technique relies on actually observing people in their jobs. This is called "following people around." There are some instances when this technique is valuable and other times when it would not be appropriate. If your team is conducting a Current State Assessment, this technique would be a good way to document the current business processes. Another reason to use this technique would be if your project involved enhancing or changing a current process. It would make sense to watch people do a current process as a way to understand the changes that would be required.

On the other hand, if you were creating a new process, this technique probably would not work. It would also not necessarily work if the current process involved a lot of intellectual work or other work that is not easily observable. It is usually not a good idea to use this technique for spying. The best method is to notify the people involved that they will be observed and that you will be taking notes. There are two basic approaches for following people around.

- *Passive / invisible.* In this approach, the analyst observes the business routine but generally does not ask questions. The analyst writes notes about what he or she sees, but otherwise generally tries to stay out of the way. If the analyst asks questions, he or she generally waits until the entire process has been completed. In fact, the analyst should tell his/her subject to pretend that he/she is invisible. The analyst generally should watch the business process multiple times to be sure to understand how the process works today and why it works the way it does.

- *Active / visible.* In this approach, the analyst still observes the current process and takes notes. However, the analyst is no longer invisible. He or she takes a more active role. When the analyst has questions as to why something is being done as it is, he or she asks the questions right away, even if it breaks the routine of the person being observed. In this approach, the analyst might even participate in the work to gain a first-hand appreciation for how the process works today.

Again, this is a technique for gathering information about current processes. In many projects, it is important to understand the current processes to make sure the new solution meets current and future business needs.

Function Points

 (Product: TenStep Project Management Process)

People in the development world have a difficult time creating tangible metrics that tell how productive they are as individuals, teams or organizations. In fact, you may have the fastest, smartest, most productive development staff in the world, but what does that really mean? Normally, you would like to quantify how much work you can produce in an hour or a day or a month, and then compare this to some average or standard. For IT development projects, this is difficult, if not impossible, for two reasons. First, it's not at all clear how to measure what you are producing on an IT development project. Second, even if you found a way to measure what you produced, chances are that no one else is measuring what they produce in the same way. Therefore, you cannot compare yourself to others, or to some standard, in any meaningful way.

The concept of function points was introduced to try to resolve this dilemma. Function points by themselves do not show productivity. Function points are a way to measure the

size of a software application. Since function points are measured in a consistent way on all IT development projects, saying that one application is 2,000 function points and another application is 4,000 function points lets you know that one application is twice the size of another.

The details of function point counting are more complex than what can be described in one, or a series, of pages. In fact, the IFPUG Counting Manual is a couple hundred pages long. This book is just the beginning. Reading should be supplemented by additional training and experience before a person will feel comfortable doing function point counting. However, in summary, the basic concepts of function points require you to look at five areas of the application:

1. *Internal logical files* include data that the users are responsible for maintaining themselves.

2. *External interface files* are files that are needed from other systems. This data is used for inquiry or reference, and is not updated by your application.

3. *External input* refers to the functions that allow the user to manipulate internal data. This is usually in the form of transaction adds, changes or deletes.

4. *External outputs* are functions that allow the user to request an output through the manipulation of data in the system. This could be information on reports, output screens, webpages, etc. The key is that the data is processed or transformed into new information that is made available to the user.

5. *External inquiries* refer to information that is basically displayed directly from underlying tables. If you display information on a customer that comes directly from a customer file, then it is external inquiry data. If some fields were transformed based on internal program processing, it is more likely external output (#4 above).

Once the basic characteristics of the application are determined, an algorithm is applied that weights certain areas higher than others. But once the basic counts are determined, the number of total function points can be determined easily by applying the formula.

Functional Manager

(Product: TenStep Project Management Process)

The functional manager is the person that you report to on the organization chart. Typically, this is the person that does your performance review. If you are on a project, your project manager may also be your functional manager, but he or she does not have to be. If your project manager is different from your functional manager, then your organization is probably utilizing matrix management.

Functionally-Based Organization

There are three types of project relations organization structures – project-based, functionally-based and matrix-based. In a functional organization, a project team is staffed with people from the same department, functional organization or portfolio. All the resources needed for the project team come from the functional organization. The biggest advantage to a functional organization is that there is usually clear authority, since the project managers tend to also be the functional managers. You also do not need to negotiate with other organizations for resources, since all of the staff needed by your project will report into the same functional organization. Other advantages of this organization are that the team members tend to be familiar with each other since they all work in the same area. The team members also tend to bring applicable business knowledge of the project. This staffing model is sometimes used in large, decentralized organizations, where each department or division needs to act fairly autonomously.

A disadvantage is that project team members may have other responsibilities in the functional organization since they may not be needed full-time on a project. Rather than work on another project, they may have support responsibilities, which could impact their ability to meet project deadlines.

Future State Vision

A Future State Vision describes what your organization would look like in the future as it fulfils its mission. The Future State Vision describes how you would be organized, the skills your people would have, what the culture would look like, how people would behave, etc. Generally a Future State Vision is compared to a Current State Assessment so that you can determine how much work is required to move from where you are today to where you want to be in the future.

Gantt Chart

A Gantt chart is a bar chart that depicts activities as blocks over time. The beginning and end of the block correspond to the beginning and end date of the activity. It is usually used to provide a visual look at a project schedule.

Gap Analysis

A Gap Analysis shows the differences between your Current State and your Future State Vision. In many cases, you can't determine the amount of work required to achieve your future vision without understanding this gap between that vision and your current state. The Gap Analysis, in turn, is used to create a tangible plan that you can execute to help close the gap and move you toward your desired future state.

Goals

(Product: TenStep Project Management Process)

Goals are high-level, vague statements that describe what your organization is trying to achieve in the next one to three years. The achievement of goals (through the execution of your strategy) helps the organization accomplish its mission and moves the organization closer to its vision. Goals have the following characteristics.

- The goal should reference the business benefit in terms of cost, speed and/or quality.

- Because the goal is at a high-level, it may take more than one project to achieve. For instance, the achievement of a goal may require new processes, new training classes, new IT systems and a revamping of the company rewards system. It may take many projects over a long period of time to achieve the goal.

- Goals are deliberately vague. If you can measure the achievement of your goal, it is probably at too low a level and is probably more of an objective.

- On the other hand, if your goal is not achievable through any combination of projects, it is probably written at too high a level. A goal statement that says you are trying to achieve a perfect customer experience is not possible with any combination of projects. It may instead be a vision statement, which is a higher-level statement showing intent, but which may never actually be achieved.

Goldplating

(Product: TenStep Project Management Process)

You should always strive to carefully set expectations and then meet those expectations. However, if you are not confident in your ability to deliver, you may also have heard it is better to under promise, but over deliver. This is actually a good thing if it refers to your ability to deliver your work earlier than promised or for less money than you estimated. However, it is not the right thing to do in terms of business requirements.

The term goldplating refers to delivering more requirements than what the client requested. Even though it might seem that this is a good thing, it actually is not. It is wrong for two reasons. First, the primary focus of the project should be to make sure that you deliver what the client wants - on time and within budget. By adding in additional work, the risk increases that the project will not meet its deadline or budget. If you end up missing your deadline

date, you will not find sympathy if you explain that the date was missed because of adding more work than the client agreed to.

Second, if you goldplate, you are taking it upon yourself to make a business decision on what is of most value to the client. There may be some good reasons why the additional features were not included in the initial project scope. They may, in fact, be of marginal value to the client. There may be more value in having the solution completed early and for less cost. The point is that this is a client decision and not one that the project manager should make. If you can complete the project earlier or for less money than was budgeted, let the client make the decision on what to do with the good fortune.

Governance

(Product: PMOStep Project Management Office Framework)

Governance is the term used to describe the formal and informal set of processes that allow organizations to resolve conflicts, make decisions and ensure management decisions and policies are enforced through the management hierarchy. Governance is a top-down management process and works as follows:

- If an organization implements a policy, the head of the organization needs to hold the managers in the organization accountable to make sure the policy is followed.

- Each manager then makes sure that his or her direct reports adhere to the policy. If they have managers that report to them, they need to hold those managers accountable as well, and so it goes down the management structure.

Governance also needs to include mechanisms to ensure that the policies are being followed and that some rewards or consequences exist for following or not following the rules.

Every organization has a formal or informal governance process. Some are very effective and some are very weak. If you do not have a formal policy in place, try to develop a general description of your governance process and gain a consensus. Portfolio management relies on your governance processes to be successful.

Group Interviewing (Requirements)

(Product: LifecycleStep Project Lifecycle Process)

Group interviews can be used when you have multiple interviewees that have similar roles and knowledge. Group interviews fill a role between interviewing each person individually and using other techniques for large numbers of people. Group interviews are effective for talking to two to four people at the same time. If you have five or more people, you probably want to use the facilitated session technique instead. (If you have dozens, or hundreds, of people, a questionnaire approach might be utilized.)

Group interviews follow the same basic techniques as the one-on-one interview. The interviewer needs the same questioning and listening skills, and the general format of the meeting is similar. However, the meeting is obviously more complex because of the increased number of people and the interactions between them. Some of this complexity can be reduced if the interviewer has a separate person attend to take notes. This will free the interviewer up to focus on the interview process alone.

"Groupthink"

(Product: LifecycleStep Project Lifecycle Process)

Groupthink means that a group starts to mentally and perhaps subconsciously compromise on their views to obtain a consensus. For instance, if one person proposes a certain requirement for a new application, the other people in the group may agree or not oppose the idea, even though they may never have thought the requirement made sense if you talked to each of them individually. Groupthink might also occur when one or two people dominate the discussion and drive the decisions in a certain direction, even though the others might have proposed alternatives if they were talked to individually. The dynamics of the group may mean that certain people dominate and are not challenged. In all these cases, the result is that good ideas are not all brought forward, and what looks like a consensus from the group may, in fact, not be a consensus at all.

Grow the Business

(Product: PortfolioStep Portfolio Management Framework)

This category contains the work that is designed to increase your capability and competitive advantage. This work results in increased revenue, increased quality, opening new markets, etc. Examples would include implementing a new Customer Relationship Management (CRM) system. The goal of CRM is to build additional capability in your sales staff to make them more productive, to better track sales leads and opportunities, and to provide a higher level of customer service. All of this is designed to increase sales and customer satisfaction. Another example is a project to launch a new brand or to purchase a competitor.

Grow the Business work almost always represents projects. You can't "Grow the Business" by performing operations and support work. You also don't typically "Grow the Business" through small enhancements and process improvements. All of these areas might result in some marginal value, but it does not reach the level of return that would place the work in this category.

Guideline

(Product: TenStep Project Management Process)

A guideline is a *recommended (but not required)* approach, parameter, etc. for conducting an activity or task. If your organization requires certain activities or behaviors, these would be

driven by mandatory standards or policies. However, guidelines are recommended ways to do things, but they are not absolutely required.

Identification

Identification is a step in a portfolio management process. You cannot make decisions on prioritizing work without knowing what your company or organization feels is important. Identification results in establishing the context within which all other decisions are made. Identification starts with first evaluating your environment through a Current State Assessment and then contrasting the current state with a Future State Vision that describes where you want your organization to be in the future. This results in the validation (or creation) of your mission, vision, strategy, goals and objectives. Your strategy and goals will provide the high-level direction that will help align and prioritize all the work for the coming business cycle. All of the future decisions that you make in the portfolio management process are grounded on the information and criteria that you establish in the Foundation process.

Implementation Plan

Implementation is one of the key elements in many projects and is actually one of the major phases in the traditional waterfall lifecycle. In some projects, the implementation could be much more complex than the rest of the project. If you have an Implementation Strategy, the Implementation Plan simply contains the additional details required to make the strategy real. If you do not have a strategy, then the Implementation Plan typically begins with some initial aspects of the strategy and then quickly gets into the details. The Implementation Plan is used to lay out the details for implementing the solution. It is not written at the level of the project schedule details, although you should be able to complete the project schedule activities from the content in the Implementation Plan.

You cannot wait until the Implementation Phase to decide on the details of implementation for a large project. It is too late to start thinking about implementation at that time. You should put together the Implementation Plan during the Design Phase and then start working on the implementation deliverables during the Construct and Test Phase.

Incremental Testing

Incremental testing means that you test two related programs together and make sure they are working correctly. Then you add one or two additional modules to the test until all of the components are successfully working together. This is usually the best approach for large, complex systems. (The alternative approach is called Big Bang, where you wait and test the entire system all at one time.)

Incremental testing requires the creation of stub and driver programs. These are shell programs that do nothing but allow programs to make calls to other modules and databases. A stub program is one that is called by the program you are testing and a driver program is one that calls your program. As an example, say you have *Program A* that calls a second *Program B*. However, *Program B* is not ready to include in your testing. So, you create a *stub Program B* that does nothing but accept your input parameters and display the fields. This allows you to test *Program A* now and at least ensure that it is passing the correct data to *Program B*. Likewise, let us say you are testing *Program B*, but the calling *Program A* is not ready. In this case, you can create a *driver Program A* that has no logic other than to pass a predefined table of parameter input to *Program B*. *Program B* then accepts the data and performs the expected logic.

If you perform an incremental integration test, there are two general ways to put the component modules together - top down and bottom up. These two approaches are available if your solution follows a general high-level to low-level hierarchy - that is, you have general programs that call other programs for detailed processing, which, in turn, call other programs for even more detailed logic processing.

- *Top Down*. In this approach, the modules at the top of the overall logic path are tested first, using stubs for the called modules. Then the called modules are added, using stubs for modules that they might call. This continues until the entire application is tested. This can be easier to logically understand, but it saves the bulk of the testing complexity until later.

- *Bottom Up*. This is the opposite. You first start off with programs at the lower level, and utilize driver programs to call them. Then you replace the drivers with the actual programs and create driver programs to call them from one level up. This continues until all the programs are tested and in place. The bottom up approach tests the bulk of the processing logic earlier, but it is harder to see the bigger picture until later, when the more general programs are in place.

In general, incremental testing is better for large, complex systems. The integration testing process can start earlier, as soon as related programs have been successfully unit tested. This approach makes it easier to find errors, since the application environment only introduces one (or a few) module at a time. Lastly, this approach results in more overall testing, since the earlier modules get tested over and over again as new modules are added.

Informational Communication

(Product: TenStep Project Management Process)

There are three major types of communication on a project – mandatory, informational and marketing. Informational communication includes helpful information for people to know and information that will help people in their jobs. This information is usually made available for people to read, but requires them to take the initiative to actually go to the location where the information is held. Examples of informational communication are:

- Processes, techniques, best practices, templates, etc. available in a repository.

- Answers to frequently asked questions.

- Upcoming training opportunities.

- Project related communication such as the Project Charter or Status Reports available in a central location.

Informational communication is placed in a central location that people can access. You then need to tell people that the information is there. However, once you tell people, they need to take the initiative to go out and actually locate the information and read it.

Intangible Benefits

(Product: PortfolioStep Portfolio Management Framework)

Intangible benefits are positive results that are hard, perhaps even impossible, to quantify. These types of benefits include having more information to make a decision, providing a higher level of customer service or improving morale. These benefits may be real, but they are harder to quantify.

Interface Testing

(Product: LifecycleStep Project Lifecycle Process)

Interface tests are specialized tests that look specifically at all the system interfaces, especially those from outside vendors or suppliers. Things to look for include:

- Validate whether you have tested vendor feeds exactly as they will occur in production. This may require the vendor to perform a full interface test on their side to be able to send you the correct and full files.

- Ask vendors and suppliers that receive data from your solution to thoroughly test the data they receive from this test. It is not enough to see that a file for a vendor was created successfully. The vendor must process the file and ensure that the results were exactly as expected.

- Validate that the timing of the interfaces is as expected. If the file you create for a vendor is perfect, but is available too late, you may still have problems.

- If there is input and output from an interface, make sure it is tested both ways.

- Your prior testing should ensure that your solution is accurate, usable and stable. Interface testing makes sure that there are no surprises that arise from areas outside of your solution.

International Organization for Standardization (ISO) 10006

(Product: TenStep Project Management Process)

The International Organization for Standardization (ISO) is a specialized international agency that promotes the development of precise standards to help ensure that products, services, and materials throughout the member nations remain consistent. This standardization helps to facilitate the international exchange of goods and services and to develop cooperation in intellectual, scientific, technological, and economic activity. The results of ISO technical work are published as international standards. The hope is that if a company uses processes that result in the achievement of an ISO certification, the products produced by that process will meet some minimum standards of all countries in the area of relevance.

The international standards for project management are reflected in ISO 10006, and they are similar in nature to the PMBOK® Guide from the Project Management Institute (although the ISO standards are much less comprehensive). The ISO 10006 document itself is written at a very high-level (in only 20 pages).

Issue

(Product: TenStep Project Management Process)

An issue is defined as a problem that will impede the progress of the project and cannot be totally resolved by the project manager and project team without outside help.

If a problem arises that the project manager and the team can resolve, it is just one of the many fires that will ignite and be put out in a given week. However, an "issue" arises if outside help is needed. This is the time to ensure that a process is in place to make the appropriate people aware of the issue and then resolve the issue as quickly as possible.

Issues management is one of the skills that all project managers must master. Most large projects have to deal with issues. They cannot be ignored and they cannot be deferred to some later time. Issues must be resolved quickly and effectively.

Joint Application Development (JAD)

(Product: LifecycleStep Project Lifecycle Process)

There is a specific technique (or set of techniques) for more rapidly gaining a consensus from a group of individuals. The technique is called Joint Application Development, or JAD. Judging by its name, you might think that this technique only applies to developing software, but that is not the case. The JAD technique can be applied to a wide variety of areas where consensus is needed. This includes gathering business requirements, creating mission and vision statements, defining a project, building a quality management plan, etc.

The purpose of the JAD session is to dramatically reduce the timeframe required to complete a deliverable where consensus is required. Notice that this definition does not state that you will dramatically reduce the cost. Depending on how the JAD is implemented, it may, in fact, cost more than the traditional methods. This can occur if you need to gather the JAD session participants from many locations and have to pay travel expenses. However, in many cases, your management and sponsor are willing to pay more for a process that takes much less time.

How dramatic might the time savings be? They can be very dramatic. As an example, the time required to produce the key components of your requirements might be reduced from six weeks to one week, or perhaps even two days. So, you are not talking about reducing turnaround time by 10%. JAD sessions can result in dramatic improvements – maybe 75%, 80%, 90% or higher.

The key concept of a JAD session is that you get all of the major decision-makers, stakeholders and knowledge providers into one place at the same time. The dramatic reduction in time comes from removing the lag required to move information from person to person. If a stakeholder has a question about scope, they can ask it in the context of the JAD session. The people required to answer the question are in the room and can answer the question immediately – no time delay and no misrepresenting the question. A two-week process of getting a question clarified and answered can instead take place in ten minutes, since all of the right people are together at the same time.

For example, if the JAD session is used for requirements gathering and approval, if possible, the JAD session should result in a consensus on the requirements and the requirements being approved. This requires that you have the right people involved for the right amount of time, you have a facilitator to guide the discussion and you have a scribe to document everything. If everything and everyone is available to you, you should hopefully be able to create a final set of requirements and have the participants sign their approval before the JAD session ends. This cuts through the entire traditional requirements gathering cycle of validation, specification and verification.

Key Learning

(Product: TenStep Project Management Process)

A Key Learning is notable information discovered while performing an activity, utilizing a tool, creating a deliverable, etc. When key learnings are shared, productivity can be gained by warning others of pitfalls or informing others of valuable short cuts, tips, etc.

Key Performance Indicators

(Product: PortfolioStep Portfolio Management Framework)

The term key performance indicator (KPI) is used to indicate success targets. (Key performance indicators are sometimes also called key business indicators (KBIs).) The term normally indicates something very important to measure as it relates to your business. Metrics are designated as KPIs if there is a sense that they are critical to the success of your company or your organization. The general idea is that your organization will not successfully achieve its objectives unless these KPIs are met.

Usually key performance indicators focus on processes. For example, one of your KPIs might be to reduce the time it takes to ship an order to a customer. This is a process-related success measure.

Lead the Business

(Product: PortfolioStep Portfolio Management Framework)

Some of the work that happens in the portfolio is not directly support (Support the Business) or growth oriented (Grow the Business). Some of the work in the portfolio has to do with management and leadership. The "Lead the Business" category of work is for internal initiatives that are required to strengthen your organization so that you can further lead the business toward its goals, mission and vision. For instance, your organization may decide to place a major emphasis on Knowledge Management. You may think that if you are better able to share and leverage knowledge, you will be able to deliver work better, faster and cheaper. If you are the IT organization, you might take this a step further and sponsor a Knowledge Management initiative across the entire company. This is an effort that was not necessarily championed by the business, but it is an area that the CIO might sponsor as a way to lead the business. This is called "Lead the Business" work because you are undertaking the project on behalf of the entire company – not just your own organization.

Another example might be a project to move your organization to a level 2 on the Capability Maturity Model (CMM). The sponsor might believe it will help the organization be more efficient and effective. CMM 2 should help you deliver your work better, faster and cheaper. If you are successful, other organizations in the company may want to move to CMM 2 as well. However, one organization may take the lead in the hopes of making a major business impact after it has been successfully implemented. This category is more than just running the business and it may not directly lead to growing the business. However, there is a sense that by executing projects like these, your organization's capabilities will increase, which will lead to being more efficient and effective in the future.

Lifecycle

(Product: LifecycleStep Project Lifecycle Process)

This term refers to the process used to build and support the deliverables produced by the project. (Since a project has a start date and end date, the long-term support of a solution is

usually performed after the project is completed.) For software development, the entire life cycle might consist of planning, analysis, design, construct/test, implementation and support. There are many ways to execute a project, and therefore there are many lifecycle models. The lifecycle for custom software development, for instance, might be much different that the lifecycle for a package implementation project. Although there are many lifecycle models, usually there are a smaller number - perhaps just one, that is optimal for the specific project at hand.

Main User Contacts

(Product: SupportStep Application Support Framework)

This contact may or may not be the same as the Application Business Owner. Sometimes he or she is not the same person because the person who is the Application Owner is at too high a level to effectively deal with the day-to-day decisions needed on the application. Your company may designate the CFO, for instance, as the Application Business Owner for the financial business applications. Even though it may make sense for the CFO to be the Application Business Owner, it may not make sense for the CFO to prioritize and approve requests for application changes. The Application Owner may designate a second person as the main contact to handle all day-to-day aspects of the application. The Main User Contact is the person responsible for the application on a day-to-day basis.

All applications should have an Application Business Owner and a main user contact. They could be the same person, but they do not have to be. If there are multiple people, the Application Owner is usually at the higher management level.
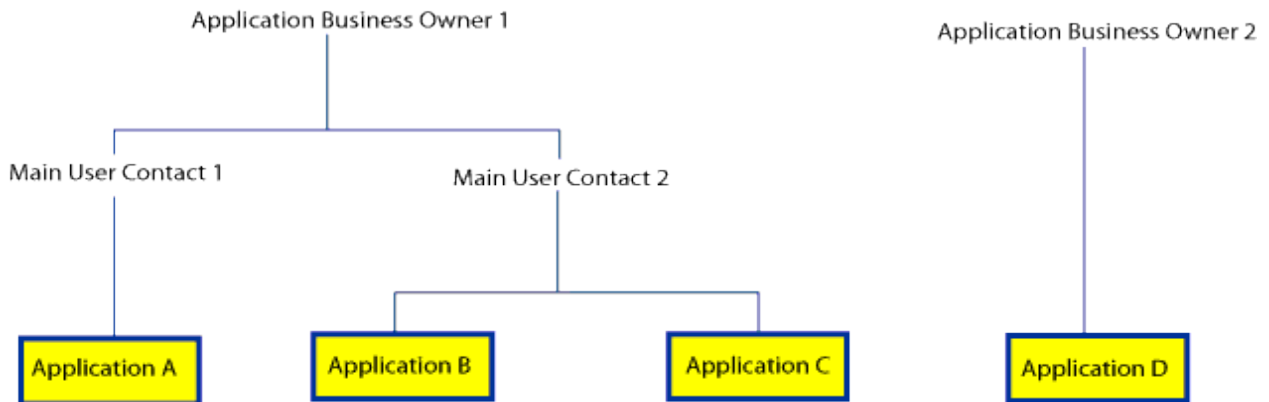
Management and Leadership

(Product: PortfolioStep Portfolio Management Framework)

Some of the work in your organization is not directly related to your business, but is related instead to your people (and indirectly, of course, to your business). Management and leadership is the category of work that includes the time and cost to manage and lead your staff. This includes time for listening to employee concerns, providing performance feedback

to your direct reports, hiring people, etc. It also includes activities required from the management hierarchy. For instance, you may be asked to read a new dress code policy and provide feedback, or you may need to spend a substantial amount of time creating a presentation on what your group does.

On the other hand, this category does not include major initiatives to invest in people capability. For instance, you may plan an initiative to introduce formal project management techniques within your organization. This might involve building a Project Management Office, deploying a methodology, training people, etc. This initiative should be structured as a project and will not fall within the management and leadership category. (It probably will fall under the "Lead the Business" work category.)

In general, you should find that there is much less work in the management and leadership category than in the other work categories. After all, only managers would spend time in this category. If your organization has 500 people, perhaps 40 to 50 are classified as managers. Of those people, perhaps 40%-60% of their time is actually in management and leadership, including the time spent specifically dealing with people management or responding to organizational requests. The rest of the time managers will spend doing projects, operations and support work. The time that managers spend working on projects should be allocated to the project. This includes the time spent in project status meetings, working on project deliverables, reviewing project reports, etc. (In some organizations, all of this time might be allocated to "management". However, this time can easily be allocated back to the actual project as well.)

Mandatory Communication

(Product: TenStep Project Management Process)

There are three major types of communication on a project – mandatory, informational and marketing. Mandatory communication includes those things that you are required to provide because of company policy, legal or auditing requirements, contractual obligations, etc. This generally includes Project Status Reports, legal requirements, financial reporting, etc. This information is pushed out to the recipients. It includes:

- Status and stewardship reports.

- Metrics and statistics reporting.

- Quality management and audit results.

- Financial reports required by the government.

Marketing Communication

(Product: TenStep Project Management Process)

There are three major types of communication on a project – mandatory, informational and marketing. Marketing communication is designed to build buy-in and enthusiasm for the project and its deliverables. This type of information is pushed out to the appropriate people. Marketing communication is especially important if you have a culture change initiative and you need to change how people do their job. In that case, enthusiasm and buy-in for your project may be critical to your success. Examples of marketing communication include:

- Awareness sessions to introduce your products and services to new audiences .

- Ongoing sponsor communication to build and sustain enthusiasm and buy-in.

- A monthly newsletter, including success stories to build awareness and maintain enthusiasm.

- Gathering success stories from people that are impacted first.

- "Name the Project" contests.

Matrix-Based Organization

(Product: TenStep Project Management Process)

A matrixed organization is one where people report to specific departments. Resources within the departments are shared on projects when they are needed. Matrixed organizations allow functional departments to focus on their specific business competencies and allow projects to be staffed with specialists from the functional areas when they are needed. For instance, Database Administrators may all report to one functional department, but would be allocated out to work on various projects in other departments when needed. Likewise, a Legal resource might report to the Legal Department, but be assigned to a project in another organization that needs legal expertise. It is common for people to report to one person in the functional organization while working for one or two project managers from other departments.

The main advantage of the matrix organization is the efficient allocation of all resources, especially scarce specialty skills that cannot be fully utilized by only one project. For instance, data modeling specialists may not be utilized full-time on a project, but can be fully leveraged by working on multiple projects. The matrix-based organization also is the most flexible when dealing with changing business needs and priorities.

The main disadvantage is that the reporting relationships are complex. Some people might report to a functional manager for whom little work is done, while actually working for one or more project managers. It becomes more important for staff members to develop strong time management skills to ensure that they fulfill the work expectations of multiple managers. This organization also requires communication and cooperation between multiple functional and project managers that need time from the same resources.

Meeting Fundamentals

(Product: TenStep Project Management Process)

Many organizations rely heavily on meetings to share information and get representation on complicated, multi-organization initiatives. Meetings can be much more effective if certain fundamentals are considered.

- In general, all meetings should have an agenda. The creation of the agenda takes a little extra work, but it can be as simple as writing it in an email and sending it to the meeting participants. Regularly scheduled meetings do not need a published agenda every week if they stick to the same agenda format. In those cases, the formal agenda is of value while the team is first meeting. Once everyone understands the purpose and the regular flow, a standard agenda model can be reused every time.

- If you have a large group of people attending the meetings, there should be a meeting facilitator, although the role can be rotated for regularly scheduled meetings. This is usually the person who requested the meeting unless other arrangements have been made. For ongoing status meetings, the facilitator is usually the project manager, but the facilitator role can be rotated.

- Make sure the participants know ahead of time of anything they need to bring to the meeting or any advance preparation that needs to take place.

- Only invite the people that need to be there. Others may dilute the effectiveness of the meeting.

- The meeting should start on time, with some allowance for those that may be coming from another meeting.

- The person who requested the meeting should explain the purpose and the expected outcome.

- Follow the agenda and watch the time to make sure everything gets covered.

- Someone should document any action items assigned during the meeting. This will be the facilitator or originator unless other arrangements have been made.

- Recap all outstanding action items toward the end of the meeting, including who is responsible, what is expected, and when the action item is due.

- Recap any decisions that were made and document them in an email (or other project communication mode as appropriate).

Methodologist

(Product: PMOStep Project Management Office Framework)

Methodologies are products and they need to be supported long-term like any other product in your company. After the initial methodology is created, a primary and backup Methodologist should take long-term support. Support includes fixing problems (misspellings, grammar, etc.), enhancing the methodology based on user feedback, creating new templates and new content, providing coaching and training and any other activities to make sure that the methodology remains up-to-date and continues to be utilized. Like other subject matter experts (SMEs), the Methodologist may not do all of the actual work, but they should be the person that manages and is responsible for the effort.

Milestone

(Product: TenStep Project Management Process)

A milestone is a scheduling event that signifies the completion of a major deliverable or a set of related deliverables. Milestones are not based on the calendar. They are based on the completion of one or more deliverables.

A milestone, by definition, has duration of zero and no effort. There is no work associated with a milestone. It is a flag in the project schedule to signify that some other work has completed. Usually a milestone is used as a project checkpoint to validate how the project is progressing and revalidate the remaining work. They are also used as high-level snapshots for management to validate the progress of the project. In many cases there is a decision that needs to be made at a milestone.

Mission Statement

(Product: PMOStep Project Management Office Framework and PortfolioStep Portfolio Management Framework)

The Mission Statement describes what the organization does, how it is done, and for whom. It is a very general statement, usually aligning the organization to the value it provides to the business. It should tie together the vision, strategy, goals, etc. that fall under it. Even if you do not have a vision statement, you should have a mission statement that quickly captures the essence of what the organization is trying to achieve.

Money and Assets

(Product: PortfolioStep Portfolio Management Framework)

If you think of a financial portfolio, you have your underlying assets, including stocks, bonds, securities, gold, etc. These assets are your actual portfolio. However, the concept of financial portfolio "management" is the process of allocating and managing your assets. If you throw all your money in a handful of investments and never think about them again, you may have a portfolio, but you are not practicing portfolio management.

Organizations also have assets. In the IT organization, for instance, assets consist of business applications, hardware, software, telecommunications equipment, intellectual property, people, etc. Every year, you buy or build new assets, manage current assets and retire older assets. Every year, your organization also receives or earns some level of funding to execute your business processes, support the assets, enhance your capabilities, etc. You allocate this funding toward internal labor, external labor, equipment, repairs, maintenance contracts, etc. Portfolio management helps you allocate your money in a way that optimizes the overall value to the company.

Money and assets may be related, but they are not the same thing. Here are some examples.

- Money can be used to purchase resources that can be used to build assets. In the IT organization, this could include software developers that are building business applications.

- Money can be used to buy an asset directly, as when you purchase a business application package rather than develop it yourself.

- Money can be used to purchase resources that provide <u>services</u>, such as the support staff for those same business applications.

- Money can be used to build products that are sold to your customers.

Some portfolio management processes focus on managing your business assets. While this works in financial portfolio management, it is more limiting when it comes to business portfolio management. As you have seen from the prior examples, your organization spends money in areas that don't directly touch underlying assets (like services). So, focusing on assets is too narrow and will result in some work being left out of the portfolio that should be within the portfolio scope.

It takes money to buy, build, run, manage and retire the actual assets in the portfolio. So, it is ultimately through the application of money that you have any impact on the assets. Therefore, the portfolio management process needs to focus primarily on managing work and secondarily on managing physical assets.

Monte Carlo Modeling

(Product: TenStep Project Management Process)

Monte Carlo modeling is a technique for managing risks. The basic idea is to run simulations of a risk event many, many times to allow a risk distribution to play out.

As an example, let's look at schedule risk, or the likelihood that your project will complete at any given time. Usually you provide one estimate of effort and duration per activity and this drives toward one end date. However, there is uncertainty, or risk, in each of the estimates that make up the project schedule, so obviously there is not a 100% chance of meeting the estimated end date. Monte Carlo modeling gives you a way to calculate and describe this uncertainty.

Monte Carlo modeling starts off a little like the PERT estimating technique. Rather than give one estimate for the duration of an activity, you provide a series of estimates that represent the best case, most likely case and the worst case. For each of these cases, you also assign a probability. For instance, there may be a 10% chance of hitting your best case estimate, an 80% chance of hitting your most likely estimate, and a 10% chance of the work extending to hit the worst case scenario. In other words there is a 90% cumulative chance the activity will be completed by the most likely scenario (10% + 80%) and a 100% cumulative chance that the work will be done by the worst case estimate (10% + 80% + 10%). You don't need to determine the percent likelihood for points in between - just those three points. (Technically you can provide estimates for any and all probabilities.)

You then have to prepare these three estimates for each of the major work activities in your project schedule. For example, you may estimate an activity to most likely take 60 hours, with a best case of 50 hours and a worst case of 90 hours. These three estimates might need to be prepared for dozens (or hundreds) of activities in the project schedule.

When you are done, most project schedule tools have a function to perform a Monte Carlo Simulation. Basically, the simulation models how the project will progress, and reaches an estimated end date. The project plan is then mapped out again, this time using differing probabilities, and therefore calculating a different end date. The reason the model is run many times is so that the risk percentages have a chance to play out. For instance, in the example above, if the simulation was run 100 times, you would expect that each individual activity would hit the best case 10 times (10%), the worst case 10 times (10%) and the expected case 80 times (80%). As the modeling tools randomly picks estimated values based on probabilities, many different project scenarios play out. However, a basic pattern starts to emerge that allows you to estimate the most likely date that your project will end. With Monte Carlo schedule estimating, you no longer tell your manager that the project will be completed by a certain date. Instead, you are able to estimate the probability that you will be finished on any individual date. Your manager may request the estimated end date that is 80% likely to occur.

Although the example above used schedule risk, you can also use this technique for providing estimates for cost and effort as well. The good thing about the Monte Carlo Simulation is that if you provide activity estimates in ranges, most tools will perform all the statistical calculations automatically. You just have to make sure that you have provided valid and reasonable estimates for the activities. You can see that the extra work required in the estimating process makes this a model to be used for projects that are very large or those that contain a lot of risk. Small and medium sized projects would probably not find value in this technique.

Multiple-Site Testing

(Product: LifecycleStep Project Lifecycle Process)

This test is specialized for those applications that are running on multiple sites that need to communicate with each other. The test is set up based on how the different sites

communicate and what the dependencies between them are. If the sites run independently, this test is easier than if there are dependencies between them. Things to look for include:

- Test the basic connections and try to simulate all the processing and communication that would take place between the sites.

- Run a performance test and a stress test to ensure that communication continues through the network to remote sites, and validate the point when network problems occur.

- Validate that you can recover single sites in the network. This may include recovering the site based on local backups and/or pushing some local files to the remote site for recovery.

- Make sure that you can get all the sites back in sync again if one goes down.

- Test how you would handle and recover if two or more sites go down at the same time.

Depending on the architecture of your application, multi-site testing may be crucial. The more sites you have that run the application, the greater the chance that there will be a problem somewhere. This test can also be difficult to run unless you have a test environment where you can simulate the multiple sites or the application is available in multiple sites already. If you have a staggered rollout schedule, portions of this test may need to be run as each location is ready to come up live.

Net Present Value (NPV)

(Product: PortfolioStep Portfolio Management Framework)

Net Present Value is a way to evaluate the value of a project. It is more sophisticated than a simple cost/benefit analysis because it takes into account the relative value of money over time. For example, let's say you have a project that costs $50,000, but will result in saving of $10,000 per year. You could say that the project has a five-year payback, since it takes five years of benefit to equal the cost. However, that is not totally accurate. Even if the cost of capital was zero, you must also recognize that the future value of money is less than it is today. If you were in charge of the company's money, would you rather have $50,000 today or $50,000 five years from now? Of course, you would rather have it today. If you had it today, you could put the money into a safe investment and earn interest. NPV recognizes that inflation erodes the value of money over time. You also know that there is some level of risk that a problem might keep you from paying the money back in five years. Net Present Value (NPV) takes all of that into account. As you compare projects, you may find that Project A has a larger financial payback over five years than a second Project B has over three years. However, Project B may have the better NPV since it reaches its payback sooner.

Network Administration

(Product: SupportStep Application Support Framework)

Different companies have different names for this group, but they are the ones responsible for the security, reliability and integrity of the computer network. This group makes sure that the entire network is safe from hackers, firewalls protect the network from outside access, and data and databases are protected and secure. They also watch over the email system to be diligent for viruses and respond quickly if a virus gets onto the network. This group will be involved in fulfilling many of the technical and environmental security requirements.

Objectives

(Product: TenStep Project Management Process)

Objectives are concrete statements that describe the things the project is trying to achieve. An objective should be written at a lower level, so that it can be evaluated at the conclusion of a project to see whether it was achieved. Goal statements are designed to be vague. A well-worded objective will be Specific, Measurable, Attainable/Achievable, Realistic and Time-bound (SMART). (However, SMART is a technique for wording the objective. An objective does not absolutely have to be SMART to be valid.)

An example of an objective statement might be to "*upgrade the helpdesk telephone system by December 31 to achieve average client wait times of no more than two minutes*".

- Note that the objective is much more concrete and *specific* than the goal statement.
- The objective is *measurable* in terms of the average client wait times the new phone system is trying to achieve.
- You can assume that the objective is *achievable* and *realistic*.
- The objective is *time-bound*, and should be completed by December 31.

Objectives should refer to the deliverables of the project. In this case, the objective refers to the upgrade of the telephone system. If you cannot determine the deliverables that are created to achieve the objective, the objective may be written at too high a level. On the other hand, if an objective describes the characteristics of the deliverables, it is written at too low a level. If the statements describe the features and functions, they are requirements, not objectives.

If the project is a part of a larger program, the objectives of all the underlying projects should be in alignment with the program objectives.

One-on-One Interviewing

(Product: LifecycleStep Project Lifecycle Process)

One-on-one interviews are probably the most common method of gathering business requirements. The technique involves having an interviewer and an interviewee, although there are some variations, including having a scribe present to document the discussion and the requirements. (If there are multiple interviewees, then the technique is a group interview.) Interviewing is basically just talking, although it is a discussion with a purpose.

The interviewer must keep control over the discussion to make sure that the basic objectives of the interview are met. In the context of the Analysis Phase, we are using the interview process to gather requirements.

Good interviewing skills take some practice. Sometimes you go in for an interview session, talk and listen for an hour, and come out with a good set of applicable requirements. Other times you may spend an hour talking to a person and not come out with any useful information. Some interviewees are good at organizing their thoughts and providing information to you in a manner that you can easily comprehend and document. Other interviewees are not as comfortable organizing their thoughts, or have a hard time expressing them and therefore need to be placed into a structured discussion. You will also find some people that are hostile or suspicious of the information you are gathering. No matter what the situation is, good interviewing skills can usually help you gather the information you are seeking. As you become more effective in gathering requirements through the interview process, you will also find that you become better at the other requirements gathering techniques as well. Although the interview process relies heavily on good verbal and listening skills, all of the other techniques do as well.

Online Screen Layouts

(Product: LifecycleStep Project Lifecycle Process)

More and more solutions require online access so that the client organization can process transactions in real-time, gain instant feedback on the success of the transaction, show information in graphical form and instantly display information queries and reports. It is rare that your project team will be creating the first online application, so hopefully you have some guidance on how to design your graphical user interfaces (GUI). In fact, if your organization has good standards for GUI interfaces, you may find that all you need to do is map the content required by this particular solution against the GUI standards and guidelines that have been previously defined.

(Note that there are many possible terms for the online screens. These could be called "panels", "screens", "terminals", "graphical user interface", "webpages", "displays", etc.)

Operations

(Product: SupportStep Application Support Framework)

The people in your organization that are executing your production business processes are doing "operations" work. For instance, your Accounts Receivable people are following-up with customers on payments. The factory is full of people who are building products. People are manning your customer service center to deal with customer questions and problems. These people are not doing "support." They are not fixing business processes. They are executing them. All of this type of work is called "operations".

The IT organization has staff that also runs the computers and the rest of the technical infrastructure. In some organizations, these people are referred to as IT operations.

Organizations (Staff-Related) vs. Portfolios (Work-Related)

(Product: PortfolioStep Portfolio Management Framework)

Portfolio management can be utilized at many levels of the company, and the higher the level the better. Different companies have different terminology to refer to their organizational structure. In some companies, this might be Company -> Division -> Department -> Group -> Team, etc. However, in other companies a department might be at a higher level than a division.

Organizations are a way to organize and structure people. Finance people, for instance, typically work within the Finance organization. Likewise, Sales people work in the Sales organization and IT people work in the IT organization. Portfolios, on the other hand, are a way to organize work. A portfolio, for instance, might be defined for the top 50 projects of your company or the top projects of a particular organization. Likewise, you may have a portfolio that contains all of the support work that the organization provides. In fact, you may decide to create portfolios that overlap with your physical organizations. For instance, you may have an IT portfolio that covers all IT people. In that case, the IT Organization would be the same thing as the IT portfolio, which includes all of the IT work. You might also create internal portfolios within the IT organization. Again, these internal portfolios could align with the internal IT departments, but they do not need to.

Portfolios are logical entities and organizations are physical entities. It is probably more efficient to have the portfolios align with the organizational structure. They are easier to manage if they are. However, they do not need to be.

Overhead

(Product: PortfolioStep Portfolio Management Framework)

Overhead is a category of work that includes time that is not work related. This includes vacation, sick time, holidays, jury duty, etc. On the other hand, management time is not overhead and project management time is not overhead. The amount of time in this category can be estimated reasonably close by adding up all of the holidays, calculating vacation days based on years of service, and using a historical average for sick time. Some of the time, like jury duty, may not be known for sure, but historical averages will be close.

You will want to include overhead time in your portfolio if you are trying to account for every possible hour in the year. You can't really prioritize overhead time, and you normally don't have the ability to change the outcome in a meaningful way. You might implement incentives, for instance, to encourage people to not take sick time, but you can't influence vacation, holidays and other overhead hours in that same way. This does not mean that you don't want to track overhead hours and make sure nothing unusual or unexpected is

happening. However, you have less opportunity to balance overhead time against other work categories. For the most part, it is what it is.

Pareto Analysis

(Product: TenStep Project Management Process)

Pareto analysis can be used when you encounter multiple related problems or a common problem with multiple causes. In this technique you are also able to collect metrics on how many times each problem or cause occurs. The purpose of Pareto Analysis is to observe the problems and determine their frequency of occurrence. This, in turn, gives you the information you need to prioritize your effort to ensure you are spending your time where it will have the most positive impact.

Pareto Analysis is based on the classical 80/20 rule. Let's say you have a problem with a product failure, based on a number of causes. Through observation and collecting metrics, you determine there are eight causes. Rather than attacking the causes randomly, a Pareto Analysis might show that 80% of the problems are caused by the top three causes. This gives you information to know which causes to solve first.

The tool associated with this problem solving technique is the Pareto Diagram. It is a chart, graph or histogram showing each problem and the frequency of occurrence. This provides more visual emphasis to the data you have observed.

Performance Testing

(Product: LifecycleStep Project Lifecycle Process)

The project team must understand the requirements for the level of transaction volume the system needs to handle. This includes normal volume, slow volume, and high volume. Examples of this volume include the number of simultaneous users, the number of database reads and writes, the number of batch transactions, and the number of webpages accessed. Of course, you need to know the volume over a specific timeframe. A system that expects 100 online transactions per hour has vastly different considerations than one that has to handle a million transactions an hour. Some of the performance measures can be taken from the requirements. Other performance measures may come from the technical design. For instance, the requirements may point out a need to process 100 transactions per minute. The design work may translate this into 1000 database calls per minute if each transaction requires 10 database calls.

The purpose of performance testing is to simulate the volume of a live system and make sure that the solution responds within expectations. If you have specific service level agreements in place, you must ensure that you can achieve them. It is very important to test at the top end of the volume requirements and not just test the typical volume level. The areas you are looking for include:

- Online response time for screen navigation

- Online response time for processing data against databases

- The time to run batch processes

- Delivery time for hard copy reports (i.e. are they ready by 8:00 AM?)

- Printer capacity to handle requests

- Downtime for batch processing or periodic maintenance

- File sizes and storage capacity

Physical Database View

(Product: LifecycleStep Project Lifecycle Process)

When you define your databases and tables, there are multiple levels of logical abstraction that make the views easy to understand for a human. However, ultimately, the databases and tables have to actually be implemented, and this actual physical view corresponds to the exact way that the data is structured into tables and file. This is also referred to as the internal view. The physical view is not known during the design phase, since the actual physical structures may be somewhat different than the final logical design. The physical view is not known for sure until the actual databases, tables and files are built.

Planned Value (PV) (Earned Value)

(Product: TenStep Project Management Process)

In earned value calculations, the Planned Value is the sum of all the budgeted estimates for all the work that was scheduled to be completed by today (or by any specific date). In many calculations, this Planned Value is compared against the Earned Value, which is the budgeted value of all of the work that is actually completed.

PMO (Project Management Office)

(Product: PMOStep Project Management Office Framework)

If you only have a couple projects going on at any one time, you may be able to gain the advantage of organizational standards by providing consistent training and having the handful of project managers following similar processes. However, the larger your organization gets, and the more projects that are executed at one time, the more difficult it becomes to enforce this organizational consistency, and without this consistency, the full value of implementing a common project management methodology is not reached.

Many organizations have attempted to solve this problem through centralized organizations that are responsible for varying aspects of project management methodologies. Many companies call these groups a "Project Management Office" or "PMO," but other names

include the Project Office, Enterprise Project Office, Project Management Center of Excellence and Project Management Resource Team. In some companies, the PMO organization contains only one person. In other organizations, the PMO team can be quite large.

Although the concept of the Project Management Office has been around for many years, for many organizations the awareness level was raised because of the YR2K problems. Many companies, especially larger ones, realized that they needed a concerted and coordinated effort to ensure that their systems could withstand the YR2K cutover. The basic infrastructure of a PMO was implemented, although with a single-minded focus on coordinating projects for the YR2K fixes. After YR2K passed, many companies disbanded the infrastructure, while others realized the long-term value in continuing to coordinate some aspects of project management centrally.

There are many potential products and services that a PMO can be responsible for, depending on the needs of the organization and the vision of the PMO sponsor.

However, before the PMO can be successful, there must be an agreement from the management team on their overall role and the general expectations they need to achieve. A typical PMO is responsible for deploying a consistent project management methodology within the organization, including processes, templates and best practices. This is not a one-time event, but a broad initiative that could cover a number of years. Some organizations set up a PMO to do much less than that. Some PMOs do that and more.

PMO Manager

(Product: PMOStep Project Management Office Framework)

The PMO Manager is the person responsible for managing the processes and people within the PMO. In traditional PMOs, this is a functional manager position, and the PMO Manager would report to the next level manager in the management hierarchy. When the PMO is starting, it is likely that you will have a large project (or a program) established for the initial deployment. In that case, this role may use the title of PMO Program Manager or PMO project manager.

Point of No Return

(Product: LifecycleStep Project Lifecycle Process)

You typically want to get a final "go / no go" decision from your sponsor before you proceed to implementation on your project. You then proceed to actual implementation with the thought that if there are problems, you can always go back using your rollback option. You can uninstall the changes or perhaps continue to run the old solution while the new one is getting fixed.

However, in some cases, there is not a good rollback option. That is, when you decide to implement the new solution, you are basically committed to moving forward - you don't have a viable rollback option. When this type of implementation occurs, there is always a date that is referred to as the "point of no return."

The point of no return is a date when certain activities occur that commit you to proceeding to implementation. And, once you commit to implement, there are not viable options for rolling back the changes. For example, you may be implementing a solution that dramatically alters the way that a monthly financial closeout process works. The closeout process is not in effect until the end of the month, but it requires changes to the data entry throughout the entire month. Implementation starts at the beginning of the month, even though the majority of the impact does not occur until the end of the month. In this case, you make a commitment to implement at the beginning of the month. If you discover a problem during that month, or at financial close, you may not have the ability to rollback the changes since all of the work for the current month reflects the new changes. You are just forced to fix the problems as they occur. In this case, once you placed your original changes into production at the beginning of the month, you passed a "point of no return." At that point, you are live, and any problems need to be fixed going forward.

Policy

(Product: PMOStep Project Management Office Framework)

A policy is a guiding principle designed to influence decisions, actions, etc. Typically, a policy designates a required process or procedure within an organization.

Portfolios

(Product: PortfolioStep Portfolio Management Framework)

A portfolio will typically be the umbrella structure over a group of related or unrelated work. A portfolio may also be defined to contain projects, support, operations, non-labor expenses, etc. (although those types of work do not have to be included). Usually, a portfolio encompasses all the work associated with a specific company organization or a specific collection of work that needs to be managed together. For example, you might organize a Finance portfolio, which would contain all of the work associated with the Finance function. This work would all be related. On the other hand, you could have a portfolio of the top 50 projects in your company, and that work may not necessarily be related. A portfolio allows you to optimize investment decisions by prioritizing and balancing all work within the portfolio.

Portfolio Management Sponsor

(Product: PortfolioStep Portfolio Management Framework)

Any portfolio management process needs to be sponsored by some manager in the organization. Typically, the size and organizational span of the portfolio is dependent on this sponsor. For instance, if the process is sponsored by the company President or CEO, the portfolio management process can be implemented within the entire company. If the sponsor is the CIO, then portfolio management can typically be implemented within the IT organization. The manager who sponsors portfolio management needs to set the overall direction and vision for portfolio management to the entire organization, champion its use, and continually follow up to make sure the process is implemented successfully.

Portfolio Management Team

(Product: PortfolioStep Portfolio Management Framework)

This is the group of managers who are responsible for managing the portfolio of work. The exact makeup of this group is dependent on exactly how you define your portfolio. If your portfolio only includes projects, there may be a number of managers who are responsible for all of the projects. If you include support and operations in your portfolio, then you will have group managers from these areas as well. The Portfolio Management Team is responsible for the efficiency and effectiveness of the internal running of the portfolio. They should meet on an ongoing basis to manage the portfolio and update the overall work and staff allocation plans.

Portfolio Performance Metrics

(Product: PortfolioStep Portfolio Management Framework)

The portfolio management team needs metrics (measures) to show how effectively they are running the portfolio. Some of these, such as your budget reports, are usually readily available from your Finance organization. However, some will need to be calculated within the portfolio. Examples of internal metrics include:

- **Total capacity**. Total capacity tells you how many potential hours your staff is available to work. It usually is calculated by taking total available hours and subtracting out the overhead hours.

- **Utilization rate.** Your utilization rate tells the percentage of time that your people are actually allocated to operations, support, projects and discretionary. If you have already factored out the overhead hours, the utilization rate should be close to 100%. If you have not factored out overhead time, utilization rates should be around 75%-80%.

- **Available hours.** This is a forward-looking metric that tells how many hours people are unassigned in the future. The portfolio management team must focus on people who have available hours in the next three months and try to assign them additional work or a new project.

- **Downtime (per person).** This metric tells you how many hours people are unallocated. This can happen, for instance, if a person comes off a project and does not have another place to be assigned immediately. This number should be as low as possible.

- **Work allocation Balance Points vs. actual (actual $ per category and percentages).** This shows how well you are balancing the work in the portfolio versus your Balance Points. For instance, if you have a target for your support work to be 40% of your entire portfolio workload, you can track this target against the actual numbers for the portfolio.

- **Project budgeted cost vs. actual.** These are basic financial numbers that should be tracked for each project in the portfolio and then rolled up at the portfolio level as well. If the total project budgets exceed their targets, it could mean that other authorized work will not be able to be executed.

- **Project budgeted schedule vs. actual.** All projects should be tracking their performance against their targeted completion dates. Again, if projects are tending to run over their deadlines, it may mean that other projects will not be able to start because the resources are still tied up in other projects.

- **Rework**. Reported from the project teams.

- **Defects.** Reported from the support teams.

- **Service level agreement commitments vs. actuals.** Reported wherever they are applicable, but usually these are related to support teams.

- **Client satisfaction.** All projects and operations and support teams should be reporting some kind of customer satisfaction metrics.

The reason you gather organizational metrics and feedback is to determine if you are meeting your objectives and to improve your processes. For instance, let's say you have an objective that 80% of all projects will meet their budget and deadline criteria. If your monthly metrics show that you are only meeting the criteria 60% of the time, you are obviously failing. Further investigation should help determine the causes, and corrective actions should be undertaken to improve these numbers. Likewise, if a quarterly survey reveals that your clients rate your portfolio low on your communication skills, you have time to improve the communication channels to ensure the clients are getting the information they desire.

Positive Risk

(Product: TenStep Project Management Process)

Risk is usually associated with potential events that have a negative impact on the project. However, there is also a concept of opportunity risk or positive risk. In these instances, the project manager or project team may introduce risk to try to gain much more value later. For instance, a team may decide to utilize a new technology on their project because they think it will result in dramatic effort and cost savings. Of course, there is also a chance the new technology will not work. However, the team introduces the risk because of the potential for gain. This is an example of intelligent risk taking or positive risk.

Power Users

(Product: SupportStep Application Support Framework)

Many applications have one or more users that are more sophisticated in their use of the system and have more need for information. These people don't just use the basic application. They also use the advanced features and functions. In many cases, they can run or even create pre-built queries. Sometimes they can write their own ad-hoc reports and queries. These people are referred to as power users. In most cases, their jobs require them to have the ability to use the application to a far higher degree than regular users. They may even have some basic IT skills.

The reason that people are classified as power users is that they place greater demands on the support organization. Instead of needing help for basic problems, these people may need special training and special data access. They may have support questions regarding how the application data is structured, and they may need help comparing their ad-hoc queries against other production reports. They are people that can also provide informal support to the rest of the users. Because of their advanced knowledge, they may be relied upon to assist with answering questions from normal users and from client managers. The power users may or may not have special designations or titles, but they should be identified by the support organization. This allows the support group to understand the special needs of the power users and make sure that the support level is appropriate.

PRINCE2®

(Product: TenStep Project Management Process)

PRINCE2® is a project management methodology that was created for use by the government of the United Kingdom. It is used in the private sector as well, and it has become popular in many European nations. PRINCE2 is broken down into eight processes. Of these eight processes, three (Starting up a Project, Initiating a Project, and Planning) deal with planning the project. Both Starting up a Project and Initiating a Project occur at the beginning of the PRINCE2 methodology, but Planning is an ongoing process throughout the life of the project. PRINCE2 devotes three remaining processes to executing the project. PRINCE2's Directing a Project process is performed by the Project Board and does not deal with the daily activities of the project manager.

Principles

(Product: PMOStep Project Management Office Framework and PortfolioStep Portfolio Management Framework)

Principles provide an organization with rules of behavior, and moral and ethical statements for how it will function. Usually, the principles describe how people within the organization

will act, and how they will interact with other people inside and outside the group. They provide guidance on how to deal with people and teams, especially when you encounter problems.

Prioritization

(Product: PortfolioStep Portfolio Management Framework)

Prioritization is a step in a portfolio management process. In many (if not most) organizations, there is much more work requested than the organization can execute in one year. After all the work has been selected, a prioritization process is used to determine which work will actually be funded and executed. In a good portfolio management process, prioritization is based on the work that provides the most value to the organization and the work that is most aligned to the organization goals and strategies.

Problem Priority / Severity Levels

(Product: SupportStep Application Support Framework)

Support requests should be prioritized to provide the support team a sense for the relative criticality of the need. If a user has an error that has caused their application to crash, he or she may issue an urgent support request since he/she may not be able to do other work until the application comes back up. Other production problems need to be corrected, but there may be some flexibility in terms of timing and urgency. For instance, the problem may not need to be resolved for a day or two.

These priority levels can also help your team establish service level commitments with the client. For instance, the highest priority calls (urgent) may need to be resolved in three hours. A low priority call may not need to be resolved for three days.

The support team normally designates the overall severity of the problem based on the initial contact with the client. The support team normally designates the severity level since there is a tendency on the part of the client to think that every problem is urgent or high-priority. If the client is not in agreement with the designation, he or she should escalate the matter. A rating scale for support requests is as follows:

1. *Severity 1 (Urgent).* A major service disruption usually associated with downtime or erroneous information in critical business processes. For instance, an online application is down and users are idle until the application comes back up again. Problems with customer-facing applications are normally classified as urgent as well, since your company does not want to tell customers that you cannot service them because of computer problems. These problems need to be addressed quickly and resolved with a high degree of urgency. For instance, you may need to return these calls within one hour and resolve the problem within four hours. Any resources that are necessary to resolve

the problem are assigned. If the situation cannot be resolved in that timeframe, the support people remain engaged full-time until it is resolved.

2. *Severity 2 (High).* This is a definite problem that needs to be resolved, but there is some additional flexibility on the resolution time. For example, you may have four hours to contact the user and one business day to resolve the problem.

3. *Severity 3 (Medium).* A nuisance in the short-term, but will cause a problem if not resolved soon. There may be a workaround that can be used in the short-term. You may need to follow up with the requestor within one business day and resolve within three business days.

4. *Severity 4 (Low).* These support requests should be resolved, but there is an abundance of time to complete. There may be a workaround that will be fine indefinitely or perhaps the nature of the problem is such that it does not cause a major problem. If a support call stays at a low priority for some period of time, it is likely that it is really a discretionary request. You can then close the problem ticket and open a discretionary request instead. As a discretionary request, it will be prioritized by the Client Business Owner and it will be resolved if and when the Business Owner places it high enough in the discretionary workload queue.

Procedure

(Product: TenStep Project Management Process)

A procedure is a clear specification for the sequence, timing, execution, etc. of a process. It is the lower level implementation details of a process.

Process Models

(Product: LifecycleStep Project Lifecycle Process)

Process models are helpful when you are trying to describe complex processes and the relationships between them. In many cases, it can become very tedious and cumbersome to try to describe the processes and relationships using words alone. Process models have the advantage of utilizing a precise set rules and syntax that take much of the ambiguity out of a process.

All processes have inputs, some actions that transform the input, and an output or result. When doing process modeling, first look for the high level series of related activities that represent one logical process. Give this process a descriptive name – usually in the form of a noun. For instance, there may be a series of activities that describe a process called "Sales Order." The process itself can be described in terms of a business definition, frequency of occurrence, relative importance, etc.

Process Requirements

(Product: LifecycleStep Project Lifecycle Process)

Process requirements describe how people interact with a product and how a product interacts with other products. For example, when you discuss how data gets moved and how business transactions flow from one point to another, you are describing process requirements. If you need to handle billing transactions, most of the requirements could end up being process-oriented. This would include how billing transactions move from orders to invoicing to accounts receivable. They can describe at what points people look up a status, how people manually update an invoice and what people should do if accounts are out of balance. These are all characteristics of describing a process, and so they are process requirements.

Products

(Product: PMOStep Project Management Office Framework)

Products are tangible items that an organization or a project team produces. "Products" usually refer to items that are utilized by a client. On a project, for instance, the team may produce reports and other interim documents that are used by the project team. These would be deliverables. On the other hand, the end result of the project – the tangible end result of the project, would be referred to as a product. Products usually have a longer lifespan and are managed through product management processes.

Product Management

(Product: PMOStep Project Management Office Framework)

Product management is an approach for centrally coordinating the activities surrounding the long-term support and enhancement of a product. The person who manages these responsibilities is called a Product Manager.

Product Requirements

(Product: LifecycleStep Project Lifecycle Process)

Product requirements describe the business needs in terms of the main deliverables or products that are produced. If you were building a bridge, for instance, most all of the requirements would be product-based. These might include the number of cars the bridge would hold, the strength of the steel, the water level it needs to span, the color of the bridge, etc. Product requirements describe physical characteristics of the deliverables or products being produced by a project.

Program

(Product: ProgramStep Program Management Process)

Some initiatives are so large that it makes sense to break them up into a set of smaller projects. These smaller projects are easier to plan, manage and finish successfully. However,

the problem with breaking up work into smaller projects is that each project may start to make independent decisions that will be good for that project, but detrimental to the initiative as a whole.

The purpose of a program is to provide central management and control over a set of underlying projects that are all trying to deliver a common solution. The program allows the projects to achieve a common benefit that would be difficult to achieve if each project was managed separately.

A program is an umbrella organization over a group of related projects. If a large project is broken up into a series of projects that run sequentially, you just have a set of related projects. You do not have a program. A program implies that one or more of the projects is running in parallel with others. A program is managed by a program manager. The basic responsibility of a program organization is to provide overall management, coordination and guidance to the projects running within the program. All of the projects in the program are related and all are set up to deliver portions of a very large deliverable or set of deliverables. Programs typically do not contain operations and support work. If they do, it is only for a finite period of time when some deliverables need to be supported and run, while other projects are still working on other aspects of the final solution.

Program Manager

(Product: ProgramStep Program Management Process)

The Program Manager is the person with authority to manage a program. The Program Manager may also be responsible for one or more of the projects within the program. The Program Manager leads the overall planning and management of the program. All project managers within the program report to the Program Manager (for the purpose of the project).

Project

(Product: TenStep Project Management Process)

Projects represent work that has a specific beginning and end, and results in the creation of one or more deliverables. In general, you definitely want to track all authorized project work within your portfolio. In fact, if you don't include projects in your portfolio, then there is really no big reason to utilize portfolio management. There are few portfolios that only include discretionary, management and support work. Projects are funded based on their alignment to overall strategy and goals, as well as the overall business value.

Project Audits

(Product: TenStep Project Management Process)

Project audits can be used on both the people and process side by serving two major purposes.

1. Project audits are used to check compliance and ensure that project management processes are being used as they should. The results of the project audits will be used as input into the periodic organization assessments.

2. Auditing can also be an opportunity for coaching. The auditor can act as a coach and assist the project manager in understanding how the methodology is applicable to his or her project. If project managers are open-minded, a project audit can be an opportunity to learn new things about how the project management processes apply to them. If there are areas where the audit finds room for improvement, the project manager and the auditor can discuss the value of the additional recommendations.

Some project managers see project audits as a point of intrusion and a mechanism for slapping them if they are not following the processes as they should. However, if a project manager chooses to take advantage of project audits, they can be great opportunities for learning.

There is no question that the primary purpose of the project audits is compliance. It is one thing to train and coach the project managers in the organization, and have all the appropriate processes and templates defined. It is another thing for the new processes to actually be adopted and utilized by the project teams. If you want to change the culture and make sure that the new processes are sticking, you must make sure that the project teams are utilizing the processes correctly. The project audit is set up to ask a series of questions to ensure compliance with the required processes and procedures

The auditing process can be time consuming. Just as it is not possible to provide coaching for all projects, it is also not practical to audit all projects. Even if you could, it is not worth the effort to audit all projects. Actually, you don't need to. Much of the push to implement standard project management processes is going to come from senior and middle managers. If you audit a project in a certain area and the project team comes out pretty well, it is likely that the other projects in that same area will come out fine as well since the functional manager is probably helping with the culture change. On the other hand, if you audit a project and the team is not following the standard procedures, it is likely a sign that the manager from that area is not being supportive of the methodology, and other projects in that area will probably have problems as well.

Since you don't want to look at all of the projects, you need to look at a subset using the following two selection criteria.

- Perform audits on all large and business critical projects. For instance, if your organization has a list of the top ten projects for the year, perform audits on all ten of them as they are executing.

- Spread the other audits among the organization. For instance, if you can perform five random audits per quarter, don't choose them all from the same area. Make sure that you audit one project from five different divisions or departments. If you audit five more the next quarter, choose them from five different areas if possible. This will give you the broadest sense for how the entire organization is adapting to the changes.

If projects are badly out of compliance, they should be audited again to see what kind of progress is being made. If no progress is made, this should be escalated to the project sponsor and functional management organization.

Project-Based Organizations

(Product: TenStep Project Management Process)

When projects are large enough, it's possible to form an entire portfolio around the project team. This is especially practical when a large program has dozens or hundreds of people assigned over a long period of time. Advantages include clear authority, since the project manager is also the functional manager, and a clear focus, since everyone on the team has only the project for their primary responsibility.

Disadvantages include duplication of resources, since scarce resources must be duplicated on different projects. For instance, a large project may have its own Human Resources staff, which could duplicate a central Human Resources Department. There can also be concerns about how to reallocate people and resources when projects are completed. In a functional organization, the people still have jobs within the functional department. In a project-based organization, it is not so clear where everyone is reassigned when the project is completed.

Project Director

(Product: TenStep Project Management Process)

In some processes, the Project Director role is given to the functional manager of the project manager. This is not a standard role and can be used flexibly depending on the circumstances and the people involved on the project. The responsibilities of the role are flexible as well and should be defined early in the process. However, this role recognizes that in most organizations, the project manager is not totally responsible for a project. Typically the functional manager of the project manager has a role to play as well. This role includes helping to provide resources, helping resolve difficult issues, dealing with organizational politics, etc.

Project Inventories

(Product: PortfolioStep Portfolio Management Framework)

In addition to asset inventories, it makes sense to have an inventory of projects. The portfolio will be tracking projects as a basic feature of portfolio management. If you have a handful of projects per year, you can track them on a spreadsheet. If you have dozens or hundreds of projects, you might need to utilize a database or tool so that current and historical information can be collected over time. In addition, if you have some portfolios and some non-portfolio organizations, you can still track projects across the entire company.

Project Management Body of Knowledge (PMBOK® Guide)

(Product: TenStep Project Management Process)

One of the best known project management models is "A Guide to the Project Management Body of Knowledge" (PMBOK® Guide), which is the standard put forward by the Project Management Institute (PMI®). The PMBOK® Guide contains a lot of valuable information and processes. The PMBOK® Guide provides a basic foundation of the knowledge areas required for a project manager to be successful, but is not a methodology that you can utilize to manage a project directly. For instance, there is information, but no procedures. There are definitions, but not necessarily best practices or techniques. There are inputs and outputs, but these are not necessarily practical from the standpoint of actually managing a project.

PMO Models

(Product: PMOStep Project Management Office Framework)

The Project Management Office (PMO) is an organizational entity that has a role in ensuring that projects are completed successfully. There is more than one way to set up a PMO, and there are a number of models to consider. Success is based on understanding what your organization expects from the PMO, what your management is prepared to support, and how the PMO delivers against those expectations. In general, there are a number of models that can provide value, with varying degrees of influence and accountability for project success.

The five major maturity levels of a PMO are described below. However, there are many permutations on these basic themes. Your PMO may have some aspects of a number of them.

Type I. Project Coordination and Reporting

In this role, the PMO acts as a central repository of information on projects and their status. If you have a large organization and many projects, this could be a valuable role in itself. This type of PMO knows about all the projects going on and keeps an up-to-date record of current status, budget, duration, issues, etc. This information is gathered on an ongoing basis from each of the projects, which requires the project managers to keep up with this information as well. Part of the role of this PMO is to consolidate and issue summary Status Reports. In this role, they can issue standards for Status Reporting format and frequency. They may also keep certain metrics on how all of the projects are doing - for instance, the number of projects that are successful and the number that are not. If anyone needs information on all projects or certain projects, this PMO is the place to go.

On the other hand, this type of PMO generally has no ability to influence the projects or to help them if they are in trouble. They have little formal power or authority. If project managers do not send them the information they need, they need to follow-up with them to get what they need. If the information is not accurate or of sufficient quality, they must again go back to the project manager and ask for revisions. If they do not get the information they need, their course of action includes escalation to management and the project sponsor.

The main advantage of this limited PMO is that they act as a clearinghouse so that there is one place to go for all project-related status information. This type of minimal PMO would be useful in a few instances.

- If the organization is very dispersed or decentralized, it would otherwise be difficult to see all the active projects. The Type I PMO brings this organization-wide visibility to all projects.

- This minimal PMO would be a place to start if your organization has weak governance and the sponsor does not think that much more than these simple functions can be enforced.

- If you wanted to start implementing this basic level of a PMO as a stepping stone to implement a more sophisticated PMO in the future.

Type II. Project Management Infrastructure

This PMO is focused on delivering products to the organization. For example, the PMO builds or buys project management processes, techniques and templates. All of this is established to help project managers manage their projects consistently, utilizing best practices to give them a better chance for success.

This PMO may also establish a repository of examples and best practices from other projects. For instance, if a project manager were putting together a Project Charter and Communication Plan for a Marketing Warehouse equipment installation, it would be nice if he could review previous deliverables from similar projects in the past.

In addition to project management processes, this PMO can also work on optimizing portfolio management processes, create governance models, establish project and organization metrics, take responsibility f project management software, and more. All of these are product focused.

This type of PMO is valuable for a couple reasons. First, it helps project managers and project teams gain a common set of expectations for how projects will be managed, regardless of the specific group or function involved. If a project manager finishes a project in the marketing department and goes to a new project in manufacturing, he won't have to worry about learning new tools or techniques. The project manager utilizes a consistent set of skills, processes and tools throughout the organization.

A second benefit is that the project manager does not have to invent anything new. He can utilize a common format for the Project Charter, Communication Plan, Scope Change Log, etc. Both the project manager and the team can quickly be productive utilizing processes similar to those they have utilized in the past.

Type III. Project Management Services

This PMO is similar to the Infrastructure variety, except that it also offers services such as training, coaching, project assessments, etc. The training is used to build core competencies. Coaching could be on an ad-hoc basis when requested by a project manager, or the PMO coaches could actually be assigned part-time on a project. The people within the PMO must be experienced and successful project managers themselves.

The entire philosophy of the PMO is to be more supportive and proactive in helping project managers and project teams. Rather than just building project management infrastructure,

the PMO actively joins the battle, helping project managers develop the skills to deal with the day-to-day problems they face.

Type IV. Partial Center of Excellence

Over the past few years a newer model has become more common. It combines elements of the Type III and V PMOs. In this model, the PMO performs all of the responsibilities of the Type III and the PMO also has project managers that manage projects (Type V). However, the PMO does not have all of the project managers and the PMO is not responsible for all of the projects.

In this model, the PMO is responsible for managing the large, strategic projects only. The PMO therefore needs fewer project managers, but the project managers tend to be the most experienced and knowledgeable. One example of how this might look is as follows:

- Work is less than 250 hours. Not tracked as an official project.

- Work is greater than 250 hours, but not strategic. The PMO officially tracks these projects, but the PMO does not manage them. The project managers are assigned from the business unit where the project is executed. The PMO can provide coaching and other support as needed.

- Work is strategic. For this small group of projects the PMO will assign a project manager from within the PMO. These projects are considered extremely important to the company and need to most experienced project managers assigned.

This model allows the PMO to be more fully responsible for the most important projects, while allowing the rest of the projects to be managed with local organizational resources.

Type V. Full Center of Excellence

This PMO acts as a functional department for the project managers (just as all sales people might report to the sales department). In other words, all project managers report functionally to the head of the PMO and have a dotted line relationship to the current project sponsor or manager in the functional organization. (The reporting relationship could be reversed - straight line to the functional manager or project sponsor, and dotted line to the head of the PMO, but this is not nearly as strong or effective if the PMO is trying to manage the project management resources.)

The big difference in the PMO Resource Center is that the PMO has formal authority over the project manager. When a project is ready to be staffed, the head of the PMO looks to find the best person available and assigns him as the project manager. That project manager is be temporarily assigned to the functional organization that is executing the project, but when the project is completed, the person comes back to the PMO.

Project Management Portal

(Product: PMOStep Project Management Office Framework)

A concept that is related to a repository is the idea of a portal. The document repository is basically a place to store and retrieve documents. A portal, on the other hand, implies a central meeting place for people who have a common interest. In this case, the common interest is project management. In fact, the portal could be established at a higher level as a

place to find information on all company processes. Project management could just be one of many processes that are a part of the portal. However, the emphasis here is on a specific project management portal.

In today's technical environment, the portal for a company would exist on the company Intranet. The portal would be an Intranet website that would contain everything that is related to project management. For instance, it would have all of the project management processes, procedures, templates, policies, etc. So far, this sounds a lot like the document repository.

The difference is that the project management portal also contains other non-document features that are of interest to people. For instance, the portal could have the following capabilities.

- **Discussion forum.** This would allow people to post questions that others could answer. Forums are a way to leverage the experience and knowledge of the rest of the organization.

- **Tools.** The portal could have links to project management tools, as well as installation and licensing instructions.

- **Intranet links.** The portal could have links to other Intranet sites of interest within the company. These could be links to client departments or links to other project-specific websites.

- **Internet links.** The portal could have links to other resource and reference sites on the Internet. Project managers could go to these other websites for more information of value to their project.

- **Documents.** Of course, people also have access to all of the documents. The documents can be stored in a document repository and the repository would be linked into the Intranet portal.

- **E-learning.** You could have project management e-learning classes tied to the portal that people can take at their own pace.

- **Webinars.** You can have the tools and links to offer webinar sessions through the portal.

Notice that the document repository and the portal are not mutually exclusive. You can have both. The repository is the mechanism that you use to store and retrieve documents. The portal is an entire project management environment where people can find the information they need and can collaborate with others who have similar interests. The portal uses a repository to store the documents.

The PMO would be the logical organization to establish and maintain the project management portal. This would also give the PMO the ability to provide a one-stop area for everything having to do with project management.

Project Management vs. Product Management

(Product: TenStep Project Management Process)

Projects are the way that most new work gets delivered. All projects have certain characteristics in common. They all have a beginning and an end. Projects result in the creation of one or more deliverables. Projects also have assigned resources - either full time, part time or both. There are other characteristics as well. All organizations have projects.

Projects can be managed using a common set of project management processes. In fact, a similar set of project management processes can be utilized regardless of the type of project. All projects should be defined and planned and all projects should manage scope, communication, risk, quality, etc.

Products on the other hand, are tangible items that are produced by a project, or perhaps purchased from a vendor. (The vendor would have created the initial product through a project.) Project management can be thought of as a process. A product is delivered by a project.

Generally speaking, a "product" is a specific and well-defined deliverable that is created by a project or purchased from a third party vendor. "Product management" is an approach for centrally coordinating the activities surrounding the long-term support and enhancement of a product. The person that executes these responsibilities is called a Product Manager.

The product management process can start during the project that created the product. If you purchased the product, the product management process can begin when the product is purchased, or a little earlier in the product evaluation and selection process.

Project Management vs. Project Lifecycle

(Product: TenStep Project Management Process)

Projects are the way that most new work gets delivered. All projects have certain characteristics in common. They all have a beginning and an end. Projects result in the creation of one or more deliverables. Projects also have assigned resources - either full time, part time or both. There are other characteristics as well. All organizations have projects.

Projects can be managed using a common set of project management processes. In fact, a similar set of project management processes can be utilized regardless of the type of project. All projects should be defined and planned and all projects should manage scope, risk, quality, status, etc. Project management, however, defines the overall management and control processes for the project. Project management does not actually result in the project execution. At some point, you still need to define the actual activities necessary to build your specific project deliverables. These activities are referred to as the project lifecycle.

Just as there are common project management processes to manage most projects, there are also common models that can provide guidance on how to define the project lifecycle. These common models are valuable since they save project teams the time associated with creating the project schedule from scratch each time.

Project Manager

(Product: TenStep Project Management Process)

In general, the project manager is responsible for the overall success of the project. In some companies, this person might be called a Project Coordinator or a Team Leader; however, the key criterion for being a project manager is that the person is responsible for ensuring the success of the project.

What does it take for the project to be a success? You first must define the project and build the project schedule and budget. This is where the project manager's responsibilities start. If the project begins and you find out later that you are not clear on scope, the project manager is the one who is accountable. If your project is executing a poor project schedule, the project manager is accountable.

Defining the project means that you understand and gain agreement on the overall objectives, scope, risk, approach, budget, etc. It also includes defining or adopting the specific Project Management Procedures that will be used to manage the project.

This does not mean that the project manager must do all this work himself or herself. There may be an entire team of people helping to create the Project Charter and project schedule. However, if something does not go right, the project manager is accountable.

In general, project managers are stakeholders in the portfolio management process, but they do not have a formal role. They may, for instance, help to put together a Value Proposition of Business Case, and they certainly help in Activation by managing the projects. However, they do not have a formal role in the Selection, Prioritization or Authorization processes.

Project Phase

(Product: LifecycleStep Project Lifecycle Process)

A project phase is a major logical grouping of work on a project. A phase also represents the completion of a major deliverable or set of related deliverables. On an IT development project, logical phases might be planning, analysis, design, construct (including testing) and implementation.

Project Status Reports

(Product: TenStep Project Management Process)

Status reports are used to share information about a project and to manage expectations. All projects should report progress through Status Reports and these reports should be circulated to the sponsor and all management stakeholders. Status reports typically identify the work that was completed in the last reporting cycle, plans for the next reporting cycle,

outstanding issues, risks, major scope change requests, and any other items that would be of interest to the management stakeholders. The Status Report should also discuss the financial budget situation when that information is available.

Project Team

(Product: TenStep Project Management Process)

The project team consists of the full-time and part-time resources assigned to work on the deliverables of the project to help achieve the project objectives. They are responsible for:

- Understanding the work to be completed

- Planning the assigned activities in more detail if needed

- Completing assigned work within the budget, timeline and quality expectations

- Informing the project manager of issues, scope changes, risk and quality concerns

- Proactively communicating status and managing expectations

The project team can consist of human resources within one functional organization, or it can consist of members from many different functional organizations. A cross-functional team has members from multiple organizations.

Prototyping

(Product: LifecycleStep Project Lifecycle Process)

Prototyping is a relatively modern technique for gathering requirements and can work well with online developments like web solutions. In this approach, you gather preliminary requirements that you use to build an initial version of the solution – a prototype. You show this to the client, who then gives you additional requirements. You change the application and repeat the process with the client. This repetitive process continues until the product meets the critical mass of business needs or until you have completed an agreed-upon number of iterations.

A prototype represents the shell of an actual production application. Prototypes are built early in the development lifecycle, and they are used to provide valuable insight into the look, feel and general workflow of an application. (Sometimes people call the first production implementation a prototype, but that is not correct. If you have multiple implementations, the first one is more aptly called a pilot.)

In a traditional waterfall project, you move from analysis and design to coding and testing. The first time the clients have a chance to look at an application is typically during the integration testing, system testing or even acceptance testing. If the business requirements are well understood up-front, this approach can still make a lot of sense. However, on a typical project, the client does not always know exactly what he/she wants ahead of time. In this case, it can be very valuable to gather an initial set of requirements and then build a

prototype that the client can see. The client is then in a much better, and earlier, position to tell you what he/she likes and doesn't like. Based on that feedback, you could begin to build a production application, or you could enhance the prototype a second (and third) time to hone the requirements in even finer detail.

Purchasing / Procurement

(Product: TenStep Project Management Process)

Purchasing is the department that is usually responsible for vendor relationships, and you may have an extended security policy that covers vendors, customers, suppliers, etc. Purchasing will build languages into contracts that ensure that these third parties also have appropriate processes in place to keep your people, products and business information safe and secure.

Quality Assurance

(Product: TenStep Project Management Process)

Quality Assurance does not refer directly to specific deliverables. It refers to the process used to create the deliverables. In general, quality assurance activities focus on the processes being used to manage and deliver the solution, and can be performed by a manager, client or a third-party reviewer. Specifically, it is a role that senior managers and sponsors must assume on projects within their portfolio. Senior managers might not be able to tell if the content of a specific deliverable is acceptable. However, they should be able to tell if the deliverable seems acceptable based on the process used to create it. They can determine, for instance, whether reviews were performed, whether it was tested adequately, whether the customer approved the work, etc.

Quality Assurance Audit

(Product: TenStep Project Management Process)

In many cases, it makes sense to have an outside party come in to evaluate the project management processes being utilized and double-check to make sure the project is progressing as expected. The project manager or functional manager might call for a project audit as part of an overall quality management program. In some cases, such as a government project, periodic audits may be called for as a part of the overall contract.

The person performing the audit could be a functional manager, the sponsor, a project audit specialist, or any internal or external person that knows the kinds of questions to ask and can understand whether the answers given sound right or not. The audit focuses on whether effective project management processes are defined and whether the defined processes are actually being followed. For instance, if the team had a formal process for managing issues and scope changes, an audit would review project issues and scope changes to see if the processes were, in fact, followed. This would include a review of the Issues Logs, Scope

Change Logs, project schedule activities, Status Reports, etc. These should all provide an indication of how effectively the team is following their issues and scope management processed.

Quality Assurance Specialist

(Product: PMOStep Project Management Office Framework)

If one of the major roles of the PMO is to perform quality assurance audits on projects within your organization, then an overall Quality Assurance (QA) Specialist should be named. This specialist will be responsible for coordinating this quality assurance service. These quality audits can be performed during projects or after projects, and they can be performed on all projects or selected projects in the organization. Other members of a PMO can actually perform the project audits, but the QA function is coordinated through the Quality Assurance Specialist. Since quality processes and the collection of metrics are tied closely, this role also includes responsibility for metrics.

Quality Specialist

(Product: TenStep Project Management Process)

On a large project, quality management could take up a large amount of project management time. In this case, it could be worthwhile to appoint someone as quality specialist. Under the guidance of the project manager, this person would write the quality plan, develop the quality control and quality assurance procedures, check that these procedures are being followed and provide advice and guidance to team members on quality related issues.

Questionnaires

(Product: LifecycleStep Project Lifecycle Process)

There is no question that you can gather better, and perhaps more accurate, requirements when you have personal contact. However, personal contact is not practical in all cases. Usually this is because there are too many people to personally contact or the time, effort and cost of personal contact is too high. For example, you may want to gather feedback from current participants in a business process, but there may be hundreds (or thousands) of individuals. It would not be practical or even possible to talk to each of them individually. In fact, it would not be effective even if you could, since after talking to a few people, you will start to hear the same experiences over and over again. Another example of having too many contributors is a government agency that is trying to gather feedback from the public, or a vendor that is trying to gather feedback from a mass market of customers.

The other area where personal interaction is not effective is if you are talking to many people who have similar roles and experiences. For example, let's say you want to gather requirements from a group of 20 users in the same basic role. You will find that the first

interview contains a lot of good information. The second interview is also good and provides a new perspective on the role, although some of the feedback is repetitive. The third interview provides a little more insight, but the majority of the feedback is an overlap of what you heard before. The fourth interview provides no new value. You could continue to interview all 20 people, but you see that they become less and less effective.

An alternative to personal feedback is to use a questionnaire or survey. A questionnaire can consist of questions and space for written answers from the participant, or it can ask questions that require a numerical response. Many questionnaires ask for a combination of ratings feedback and written feedback. There are a number of advantages to a well-worded questionnaire.

- They are a relatively inexpensive way to gain feedback from many contributors. For instance, in our example above, a vendor may try to gather feedback from thousands, or millions, of customers. A questionnaire would be an effective way to allow this mass of people to contribute their ideas.

- They can be a great way to gain information on relative importance or the prioritization of requirements. In many cases, there are not right or wrong answers for requirements. However, there are preferences and some preferences are more widespread than others. Rather than having a small group decide on the preferred requirements, a large group can be surveyed for their opinions. If you received 1,000 questionnaires back, you might find that 70% prefer one feature over another. This would mean that 300 people might have a certain preference, but you decide to address the other preference instead since it was preferred by the majority.

- The ratings feedback can be interpreted mathematically for precision and ease. One great advantage of surveys is that you can gather feedback from a tremendous number of people, and yet synthesize the results using math. You can imagine the problems consolidating interview information from 100 people. However, survey results from 100 people can be consolidated using a simple spreadsheet.

- You can get "shades of gray" from the rating feedback. A questionnaire allows you to receive answers based on a continuum or a range of possible results. For instance, instead of asking an interview question about how an individual likes a current process, you can ask a questionnaire question that allows the person to rate their satisfaction with a current process on a scale of one through ten. (You could also ask the question in an interview, but if you do, you are basically using a verbal questionnaire approach.) Again, the feedback can be easily captured and consolidated mathematically.

Of course, there are also a number of weaknesses with a questionnaire approach. These include:

- Since you are not present, you do not have an opportunity to see the non-verbal reactions from the person completing the questionnaire.

- You cannot ask follow-up and probing questions. You can hope that people explain their answers (if you have given them that option). However, you have no opportunity to use interviewing techniques to ensure

you understand what people are trying to say.

- Unless you really push the matter, you will not typically end up with a high percentage of questionnaires returned. In fact, you should be happy to receive 50% back, and return rates of 25% and lower are not uncommon. If you get too few questionnaires returned, you may not have the confidence you need to make requirements decisions since you cannot be sure that the results you have are representative of the entire group.

- Many, perhaps most, surveys are not very good, and therefore the information returned is suspect. Problems can include:

  o Making it hard for people to fill in answers, perhaps by not leaving enough space

  o Making the rating scale confusing or inconsistent

  o Giving multiple choice questions where all of the choices are not represented in the answer

  o Asking biased questions that lead the responses in a certain direction

  o Asking for one rating when a statement contains two or more implicit questions (For instance, are you happy with the *timeliness* and *format* of the report?)

There is usually a question about whether participants should identify themselves or not. Providing identification may make it easier to ask follow-up questions to gain better clarity on the responses. However, it may also inhibit feedback and may result in some people not responding at all.

Regression Testing

(Product: LifecycleStep Project Lifecycle Process)

Regression testing is a technique that can be used in a number of the acceptance tests and system tests. There are two main objectives to regression testing. The first is to make certain that a component with a defect that has been found and fixed actually does work and provides the expected outputs. Very often, programmers will "tweak" the code and report the defect fixed without truly resolving the cause of the defect. The second objective is to ensure that the fix of the defect does not break any other code and introduce new errors in the component. It is in fact this possibility that makes regression testing necessary. Regression testing validates the overall integrity of the system, not the fix of the initial defect itself.

Regression testing basically involves creating a complete set of test data, running the test, and then documenting the results. When changes are made to the solution, this same set of test cases is rerun and the results are compared to the prior standard to look for unexpected discrepancies. For example, you may have 500 test cases that have been built through the testing process. These test cases are all executed during the acceptance test. The results of the test may include a handful of errors. These errors are fixed and the same set of test data

is run again. However, this time a handful of other problems emerge that did not show up the first time. This has pointed out two potential problems. One is that the correction of a prior error has led the logic down a path to another error in code that was not exercised previously. The other potential problem is that correcting one or more of the prior errors actually introduced another error that did not exist before.

Reporting & Review

(Product: PortfolioStep Portfolio Management Framework)

Portfolio reporting and review deals largely with three main components:

- **Measure the results**. Within a portfolio there are a larger number of stakeholders to deal with than when just managing a single project. The status of the work in a portfolio needs to be gathered (metrics) and distributed frequently amongst all interested parties.

- **Integrate** changes. Managing a portfolio is a fluid process. Often work might not go as planned for one reason or another. The ability to "roll with the punches" is a must for a portfolio manager, and being able to integrate changes seamlessly is a large part of that.

- **Review and reforecast the work**. A portfolio manager must be constantly reviewing and making the necessary changes to the portfolio work.

Repository

(Product: TenStep Project Management Process)

The repository is the facility that contains all of the information you wish to store and share with others. A repository does not usually hold records and tables. Instead, a repository would house unstructured date like documents, training classes, video, emails, etc. A repository could be created for an organization or an entire company. You could also create a project repository that contains all of your project and project management deliverables and correspondence.

Repository Librarian

(Product: TenStep Project Management Process)

The repository Librarian is responsible for the accuracy, viability and ease of use of the repository. He or she ensures that simple, yet sound, procedures are established and followed to capture reusable project management documents and that the content of the repository is easy to locate and utilize. In general, he or she is the overall process owner for everything having to do with the repository.

Requirements Solicitation Model

(Product: LifecycleStep Project Lifecycle Process)

Gathering requirements requires more than just talking to people, writing down their ideas and then building a solution. It is important to have a logical and structured model for gathering requirements as your solution gets more complex and you need input from larger numbers of people. The following four-step model is used to gather, organize and approve the final requirements.

1. **Elicitation.** The Elicitation step is where the requirements are first gathered from the client. To elicit accurate requirements, the analyst must ask the right kind of questions and then listen carefully to the answers. There are a number of techniques for eliciting requirements, and your project may need to use multiple techniques depending on the circumstances.

2. **Requirement Validation.** The Validation step is where the "analyzing" starts. The purpose of validation is to make certain that the information conveyed during elicitation accurately represents the needs and expectations of the clients and stakeholders. This information is then given back to the people who provided the requirements, possibly in a number of formats, to make sure that the requirements are accurate. At this point, the analyst is not validating that the requirements are valid. The purpose is to make sure that the analyst is accurately representing the requirements as stated by each stakeholder.

3. **Requirement Specification**. Once the Elicitation and Validation steps are completed, proceed to Specification. During this step, the analyst prioritizes and formally documents the requirements in a Requirements Definition Report. The requirements are also numbered in a way that allows them to be tracked through the rest of the lifecycle. Finally, they are checked to make sure that they can ultimately be tested.

4. **Requirement Verification**. The final step in the requirements gathering process is verifying that the documented requirements accurately and completely communicate the needs and expectations of the client. The requirements are reviewed and formally approved, and the project completes whatever else is necessary to gain permission to proceed to the next phase of the project. During this step, the analyst can also develop acceptance criteria and start to write test cases for the final solution.

Requirements Management Plan

(Product: LifecycleStep Project Lifecycle Process)

The Requirements Management Plan describes how you will manage your projects' requirements throughout the project. The Requirements Management Plan assumes that the requirements have already been formally developed and approved. Sections of the plan could include the following information:

- **Roles and responsibilities.** This section lists the roles that will be involved with managing the requirements through the rest of the project lifecycle. Roles could include the project manager, lead analyst, clients, etc. The project manager, for instance, should have the overall responsibility for scope change management of the requirements. Someone, perhaps the lead analyst, should have overall responsibility for the integrity of the requirements throughout the rest of the lifecycle.

- **Tools.** Describe any automated tools that will be used to manage the requirements. There are a number of tools that can be used to document, manage and track requirements throughout the lifecycle.

- **Change control**. There should be a formal process to manage changes to the requirements. Hopefully, the entire project is using a formal scope change process. If so, this overall scope change process should be specifically applied to the changes in requirements. If there is no formal overall scope change process, a specific change control process should be documented here.

- **Requirements traceability.** If your project team is tracking (tracing) requirements from Analysis to Design and through the rest of the lifecycle, the overall process should be described here. This process should then be added to the project schedule to ensure the proper tracking of requirements occurs throughout the rest of the project.

Requirements Testing

(Product: LifecycleStep Project Lifecycle Process)

The purpose of this test is to validate that the system meets all business requirements. This test is relatively straightforward, but it requires that you have done a good job of documenting the requirements during the Analysis Phase. If you do not have written requirements, you have nothing to validate against.

A good technique is to list the business requirements down the rows of a table. In the second column, describe how you will test that the requirement is satisfied. This could include the specific test case(s) utilized. The third column has an indication that the test was completed and what the results were. Remember, you are validating that all features and functions work as they should. You are not trying to break the system. Just include one or more cases that test the business requirements and ensure that the results are as planned.

In addition to the business requirements, there may be other unstated requirements that need testing as well. These could include organizational standards, policies, auditing requirements, etc. As an example, all online screens may need to include the company logo. Although this was not a project requirement, it may be a company standard that needs to be validated.

If you are tracking requirements through the lifecycle, this test is still necessary. Tracking the requirements down through the construction modules and test cases validates that the requirement has not been forgotten. However, the project team has done the tracking and testing to this point. The requirements test is an opportunity for the client to validate that all the requirements are in the solution and work as expected.

Responsibilities

Responsibilities are the specific end results that a person in a role is expected to achieve.

Return on Investment (ROI)

This is a very popular financial model and looks at cost benefit from the perspective of the financial return you gain from any investment of resources on a yearly basis. It is simply the benefit of an investment divided by the cost. To be fully valid, the ROI should be reviewed over some window of time, not just in the first year. For example, if a project costs $100,000 and there is a $50,000 benefit per year, you could say that the ROI is 50%. Of course, the solution might also require support after the project is completed, and that cost should be factored in as well.

Reuse Environment

An environment and culture that promotes reuse can offer tremendous value to your company. Most developers think of reuse in terms of code reuse. In fact, that is usually the logical place to start. The major benefit to reusing code is that applications will be faster and less expensive to build. There should be no question that applications can be assembled from reusable objects faster than they can be built from scratch, so faster development time is a major benefit. The second major benefit is improved quality. This results from the use of pre-tested objects. Reusable objects are more stable, deliver more predictable results, and are less prone to errors in production. Faster development time and higher quality from the start should also result in less expensive solutions. This is true on a project-by-project basis. For instance, each project will use less development time and money and there is less testing required because you are using components that have been tested already.

However, there are increased costs for the entire organization because of the new processes and tools required to support the reuse environment. In fact, it is these overall environmental costs that typically spell doom for most reuse efforts. To really be successful in creating a reuse environment, you need to establish some rules on sharing, have a place to store the reusable components, have processes to help people find and use the components, etc. You will also find that components that are built for reuse take more time and effort to create, so although there is increasing value with each reuse, the original development time may, in fact, be longer and more costly.

One overall point to remember is that there are two basic aspects of the reuse culture. First, in almost every activity you do, you first think about whether there may be something already available that you can use. If you cannot use it entirely, can you at least use it as a starting point?

Secondly, for every piece of work that you create from scratch (there will still be a lot), always ask yourself whether this work is something that someone else may be able to reuse later. Of course, if you ask those questions today, they won't do nearly as much good because you do not have an infrastructure in place to handle the reusable components. However, that is the whole purpose of putting the environment in place.

Risk

(Product: TenStep Project Management Process)

Risk refers to future conditions or circumstances that exist outside of the control of the project team that will have an adverse impact on the project if they occur. In other words, whereas an issue is a current problem that must be dealt with, a risk is a potential future problem that has not yet occurred.

Everything in life has some degree of risk. Walking across the street can be risky. In the same respect, clients do not expect their projects to be risk free either. The project manager should perform a risk evaluation with the project team and the client. If you are lucky, you may find that you only have low risks. However, this exercise will alert the client and the project team to any medium and high-level risks that may cause future problems.

Risk is not necessarily bad, since it is a feature common to all projects. All projects have some degree of uncertainty due to the assumptions associated with them and the environment in which they are executed. Generally speaking, projects with a higher level of risk require more rigorous project management control, more effort and cost, and more management focus and oversight. Although the risks cannot be eliminated entirely, many can be anticipated and managed ahead of time.

Risk Management

(Product: TenStep Project Management Process)

A reactive project manager tries to resolve issues when they occur. A proactive project manager tries to resolve potential problems before they occur. This is the art of risk management. Not all issues can be seen ahead of time, and some potential problem that seems unlikely to occur may in fact occur. However, many problems can be seen ahead of time, and they should be managed through a proactive risk management process. The purpose of risk management is to identify the risk factors for a project and then establish a risk management plan to minimize the probability that the risk event will harm the project.

Risk Responses

(Product: TenStep Project Management Process)

There are five general responses to address any project risks that need to be managed.

- **Leave it.** In this approach, the project manager looks at the risk and decides to do nothing. This can happen for one of three reasons. The project manager may decide that the potential impact of the risk on the project is not substantial enough to require a risk response. This would typically be the case for low level risks and many medium level risks. The project manager may feel that the risk should be managed, but that the negative impact of the risk is not worth the cost and effort required to manage the risk. There may not be any reasonable and practical activities available to manage the risk. This is different from the prior reason where the cost was more than the benefit. In this case, there is no practical way to manage the risk, even if the risk has been identified as high. For instance, it is possible that there is a risk of your sponsor leaving and a new sponsor canceling the project. In fact, you may know that the sponsor is up for a promotion and that this scenario has some possibility of occurring. However, you may not be in a position to do much about it as long as the current sponsor is in place, and you may just need to leave it and see how events play out.
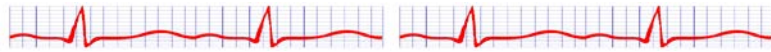
- **Monitor the risk.**
  In this case, the project manager does not proactively manage the risk, but monitors it to see whether it is more or less likely to occur as time goes on. If it looks more likely to occur, the team must formulate a different response at a later time. This approach can work for serious risks that are not likely to occur. Rather than put a plan in place immediately, the project manager creates a plan only if it looks likely that the risk will occur. The advantage is that scarce resources are expended only on those risks that are likely to occur. The disadvantage is that the delay in addressing the risk might make it less likely that the risk can be successfully managed in the future. This is also a good approach if you have identified a risk that should be managed, but the risk event is far off in the future. For instance, if your risk event is nine months in the future, it may not make sense to spend resources to manage the risk at this time. A better approach might be to monitor the risk on a monthly basis. It is possible that over time the risk will go away because of other circumstances. However, if it does not go away, the team will still need to manage the risk in the coming months.

- **Avoid the risk.** Avoiding the risk means that the condition that is causing the problem is eliminated. For instance, if a part of the project has high risk associated with it, the whole part of the project is eliminated. For instance, risks associated with a particular vendor might be avoided if another vendor is used instead. This is a very effective way to eliminate risks but obviously can be used only in certain unique circumstances. In another example, you may have a project risk associated with implementing a solution in multiple locations. Once the risk is identified, the sponsor may change the scope of the project to only implement in one location. In this way, the risk of implementing at multiple locations has been avoided.

- **Move the risk.** In some instances, the responsibility for managing a risk can be removed from the project by assigning the risk to another entity or third party. For instance, outsourcing a function to a third party might eliminate that risk for the project team. The third party might have particular expertise that allows them to do the work without the risk. Even if the risk is still present, it now is up to another party to resolve. Another example of moving the risk is buying insurance. In a simple example, you may have a very fragile and valuable part that needs to be shipped to your project team. There is

some risk that the material will be damaged. You might move the financial risk by purchasing insurance on the shipment. Of course, if the shipment is damaged, you may still lose time waiting for a replacement part to be shipped. However, you no longer have the financial risk. In exchange for an insurance payment, the insurer now has the financial risk.

* **Mitigate the risk.** In most cases, this is the approach to take. Mitigating the risk means that you put in place a set of proactive steps to ensure that the risk does not occur. Another purpose of mitigation is to ensure that if the risk occurs, the negative impact of the risk is minimized.

Role-Based Requirements

(Product: LifecycleStep Project Lifecycle Process)

One way to classify requirements is based on the role of the person that would typically provide the requirements. For instance, the user of a deliverable would likely provide a different set of requirements than a manager that only needs to get reports on a monthly basis. It's not a matter of right and wrong. It is a matter of perspective. Different people in different roles have differing perspectives on features and functions and what the relative importance of requirements is. Examples of role-based classification of requirements are as follows:

* Client requirements

* User requirements

* Sponsor requirements

* IT requirements

* Security requirements

* Auditing requirements

* Etc.

It is important to understand the role of the people who are providing requirements so that you can validate whether they are appropriate. For instance, you would not expect a high-level manager to provide detailed requirements on features and functions. If he or she does, you may need to validate whether the manager really has the right perspective to provide these types of requirements. Likewise, if a typical user provides technology requirements, you would need to validate what his or her perspective is and determine whether these are real requirements or not. A common mistake in people gathering requirements is that they accept requirements from people who are not really in a position to provide those role-based requirements. If they are accepted at face-value and not challenged, they can end up confusing the requirements rationalization and prioritization that takes place during the Specification Step.

Roles

(Product: PMOStep Project Management Office Framework)

Roles refer to a person or group that performs a certain set of activities. Roles are different than titles. Roles refer specifically to the work a person is performing at any given time. Titles refer to the specific designation of each employee that recognizes his or her skills, years of experience and place in the organization chart. For instance, a person could be filling the role of a Support Analyst, but his/her title could be "Programmer Analyst II". A person could have the role of project manager while their title might be "Team Leader I". One person can be working on multiple roles, but typically only have one title.

Root Cause Analysis

(Product: TenStep Project Management Process)

Root cause analysis is a way to identify the ultimate cause of a problem. It is usually accomplished by asking a series of 'why' questions. This technique is used when your problem is complex and the initial identification of the cause may not be accurate.

 When a problem arises, you first ask "why" the problem occurred. Then you come up with one or more causes. For each of these causes, ask 'why' again. If you can answer that question again, then the first answer is probably a symptom brought on by the more fundamental cause. Continue to ask 'why' for each answer until you can no longer generate a logical response. This lowest level is likely to be a root cause and is what generates the observed symptoms. You may discover more than one root cause through this analysis.

When you have identified the root cause(s), put an action plan in place to solve the problem. The symptoms should go away as well.

Run the Business

(Product: PortfolioStep Portfolio Management Framework)

The "run the business" category includes all the work that is required to keep your business going but does not provide any additional capability or competitive advantage. Support work would definitely fall into this category, as would the work associated with ongoing operations. Examples of people doing this work include your accounts receivable clerks, IT support staff and your internal Help Desk. It is absolutely critical that you spend resources on Run the Business work. However, you have a choice as far as how many resources are allocated. If you do not allocate enough, your business may suffer as existing business processes may be shortchanged. If you spend too much in this category, you may not have enough money to properly grow and lead the business.

You can also work in this category that marginally increases capabilities. You may call this type of work "discretionary," "enhancements" or "process improvements." You could reasonably expect that you will need to make ongoing process improvements to current business processes and systems. However, they typically only provide marginal benefit and do not result in additional capabilities or competitive advantage. These smaller work requests are sometimes called "discretionary" or "enhancements".

The last type of work that you can place in this category is work that is mandatory from a legal, tax or auditing perspective. For instance, you may have to modify your business processes to comply with a new law or regulation. You also may need to make updates to your financial systems every year to comply with new auditing or accounting rules. This work is required, but it does not result in increased capability or competitive advantage.

Schedule Variance

(Product: TenStep Project Management Process)

This is an Earned Value calculation. The Schedule Variance (SV) tells you whether you are ahead of schedule or behind schedule, and is calculated as EV (Earned Value) – PV (Planned Value). If the result is positive, it means that you have performed more work than what was initially scheduled at this point. You are probably ahead of schedule. Likewise, if the SV is negative, the project is probably behind schedule.

Schedule Performance Index (Earned Value)

(Product: TenStep Project Management Process)

This is an Earned Value calculation. The Schedule Performance Index (SPI) is a ratio calculated by taking the EV (Earned Value) / PV (Planned Value). This shows the relationship between the budgeted cost of the work that was actually performed and the cost of the work that was scheduled to be completed at this same time. It gives the run rate for the project. If the calculation is greater than 1.0, the project is ahead of schedule.

Scope

(Product: TenStep Project Management Process)

Scope is the way that you describe the boundaries of the project. It defines what the project will deliver and what it will not deliver. For larger projects, it can include the organizations affected, the transactions affected, the data types included, etc.

Without proper scope definition, you have no chance to manage scope effectively. Evoking the scope change process implies that a change is outside the scope agreed to in the Project Charter and the more detailed business requirements. If that scope is fuzzy, or leaves room

for interpretation, the client may say that the change is within scope and the project manager will find it difficult to make scope management stick.

Scope Change Management

(Product: TenStep Project Management Process)

The purpose of scope change management is to protect the viability of the current, approved Project Charter and the current, approved business requirements. When the project was defined, certain assumptions were made as to what the project was going to produce. These were identified and agreed to in the scope section of the Project Charter and the more detailed business requirements. If the deliverables change during the project (and usually this means that the client wants additional items), the estimates for cost, effort and duration may no longer be valid. If the sponsor agrees to include the new work into the project scope, the project manager has the right to expect that the current budget and deadline will be modified (usually increased) to reflect this additional work. This new estimated cost, effort and duration now become the approved target.

Sometimes the project manager thinks that scope management means having to tell the client 'no'. That makes the project manager nervous and uncomfortable.

However, the good news is that managing scope is all about getting the _sponsor_ to make the decisions that will result in changes to project scope.

This is very important. Few clients can see and express every requirement up-front. Therefore, there are usually changes that need to be introduced during the lifecycle. These changes may be very necessary for the solution and there may be valid business reasons why they should be included. The project manager and project team must recognize when these changes are requested. Then they must follow a predefined scope change process. This process ultimately brings the appropriate information to the Project Sponsor and allows the sponsor to decide if the modification should be approved based on the business value and the impact to the project in terms of cost and schedule.

Security Risk Assessment

(Product: LifecycleStep Project Lifecycle Process)

Security is an important part of the design of a solution, and it involves more than just setting up passwords. The solution must first be evaluated to determine the people that will need access and the types of things that they should be allowed to do. For the most part, the security design must ensure that those people can have access to perform those functions. However, other people must be prohibited from accessing the solution and other functions must be prohibited.

The purpose of performing the risk assessment during the Analysis Phase is to get the client engaged and active in determining the requirements for security and how security will be

implemented. There are many factors involved with creating a secure solution and a secure environment. Many of them are outside of the direct control of the project team. In many cases the project team and the client must work together with other organizations in the company to ensure that the solution and the total environment are secure.

Creating a security risk assessment includes identifying the data associated with your solution, the security level of the data, the possible threats and the vulnerabilities your design should try to address. In addition, your risk assessment should consider the likelihood of the security event occurring and the consequences of each event. This is necessary to ensure that the cost of implementing security measures is appropriate based on the potential vulnerabilities.

- **Access requirements.** First describe the legitimate uses of the solution and the people (roles) that will need access to perform those functions. These are general statements and not detailed requirements. In general, this risk assessment will determine the difficulties in limiting access to these people and functions.

- **Data security designation.** The first part of the security risk assessment is understanding the security requirements of the underlying data. Highly confidential data, like sales and payroll data, obviously needs to be protected more than data that is for everyone, such as the company open job positions.

- **Threats.** Threats to information systems can come in a variety of ways. Normal human error can result in security breaches. This may be the case, for instance, when someone opens a mail file containing a virus. There may also be threats from fraud and theft from insiders. One of the most damaging threats to systems is malicious hackers and malicious code sent to a system. Malicious code includes items such as viruses, worms, Trojan horses, etc. These threats are real, likely to occur, and bring about a great deal of cost in repairs. You should work with your client to identify the potential threats against your data. If your data is open to begin with, there is little threat associated with unauthorized use. However, data that is more confidential will have more potential vulnerabilities.

- **Vulnerabilities.** Vulnerabilities are unintentional security lapses. For instance, your solution may enforce userid/password security, but it may be vulnerable to hackers if these passwords are easy to figure out, like the current date or a person's first name. Another vulnerability may arise because of a program logic error. You may need to put measures in place to guard against vulnerabilities.

- **Likelihood and risks.** There are two areas that should be addressed for each threat and vulnerability to your system - the likelihood of the threat or vulnerability occurring, and the consequences of the breach. If a threat or vulnerability is likely and the consequences are significant, the solution should have extra security and controls in place to protect the underlying data. If the threat is remote, or the consequences of a breach are relatively minor, you would want to design less costly controls or perhaps none at all.

- **Controls / safeguards.** Now that you have a general understanding of threats and vulnerabilities and the likelihood of these security incidents, you can determine the controls and safeguards necessary to respond to that risk. Responses could include implementing firewalls, installing software to detect hackers, suspending a userid after three wrong password attempts, providing increased training, etc.
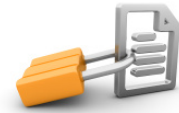
Security Testing

(Product: LifecycleStep Project Lifecycle Process)

Security testing is a set of system tests designed to ensure that your solution has the appropriate level of security built in. For instance, an Internet application that processes credit cards and stores customer information needs to be secure. It cannot be "mostly" secure or "reasonably" secure. It needs to be 100% secure and it needs to be thoroughly tested. Another application that maintains a library of company information that is available for all employees may not need a security test at all.

Understanding security needs starts with your business requirements. You need to work with your client to understand the importance and confidentiality of the data that is read, updated, and created by your application. Then, determine the types of people who have access to the application and to the data. Picture this as a table with data categories in the columns and people in the rows. For each square in the table, determine what level of access, if any, the people should have to the data. Then, you design and build the application to those requirements. Once you know who needs access and at what level, you can run tests to ensure that access is as it should be. This has two important steps.

1. Make sure that people have the level of access they need. For instance, the Accounts Payable clerks may need to browse certain functions and update others. Your testing should ensure that the clerks can access all of their data and transactions.

2. On the other hand, you should test to ensure that people do not have access to areas they should not. For instance, these same Accounts Payable clerks above may not have the ability to generate a payment request over $1,000.

Added security also has added cost. You may decide that a breach would be a nuisance, but not something you want to spend a lot of money to avoid. You may need to rely on procedures and training to help with security. You can also enforce security by generating audit reports that point out unauthorized access.

Selection

(Product: PortfolioStep Portfolio Management Framework)

The Selection step in a portfolio management process produces a shorter list of portfolio components and brings this work forward for review and scrutiny. The Value Propositions are input (as needed) to the more detailed Business Cases, which are created at this time. The

Business Case document provides supporting detail so that the work can then be reviewed and prioritized against other competing interests.

Services

(Product: PMOStep Project Management Office Framework and PortfolioStep Portfolio Management Framework)

Products are tangible items that the organization produces. "Services" refer to work done for clients or stakeholders that does not result in the creation of tangible deliverables. Services provide value by fulfilling the needs of others through people contact and interaction.

Service Level Agreement

(Product: LifecycleStep Project Lifecycle Process)

A Service Level Agreement (SLA) is a negotiated agreement that specifies the type of work, quality level, parties involved, and other expectations under which one company or organization will provide services to a client organization. A SLA helps identify expectations, clarify responsibilities, and facilitate communication between the parties involved. The purpose of an SLA is to quantify the minimum acceptable service to the business client.

A Service Level Agreement can protect the interests of all parties involved - the provider of services and the recipient of those services. The SLA should identify and define the client requirements for system operations. For example, if your client thinks the solution should be operational 99.5% of the time during regular business hours, you would definitely want to put this in your agreement.

On the other hand, Service Level Agreements can be very difficult to negotiate and difficult to measure. While you may always want some type of SLA in place when dealing with an outside entity, they can be cumbersome when utilized internally. The people involved need to make sure that they are obtaining value for the time invested in created and monitoring the solution based on the SLA.

One of the benefits of creating this document is to encourage a dialogue between the two parties and promote proactive communication. The SLA lays out the expectations of the client and the commitment of the support organization. If you have an SLA in place, there should be no misunderstandings as far as the level of service provided to the client. The support organization also can ensure that they have the resources available to meet the service level they have committed to.

The SLA is based on the level of commitment the support organization can provide for the price the client organization is willing to pay. Although the client may want a very high level of support, they may not have the funding available to pay for support services at that level.

They will then be able to reduce the service level commitments to a level that they can feel comfortable with and that they can afford. For instance, the client might prefer that all problems be resolved within four business hours. However, the level of support staff needed to meet that commitment may be higher than the client is willing to pay. Therefore, the client may agree instead to allow the support organization to resolve problems within two business days. This still is timely enough for the client's needs and will result in a support cost that the client can afford.

Six Sigma

(Product: TenStep Project Management Process)

Six Sigma refers to a philosophy, goal, or methodology used to reduce waste and improve the quality, cost and time performance of any business. Sigma is a Greek letter used to indicate the amount of variation or defect level in a product. (A defect is defined as anything that causes customer dissatisfaction or strays from accepted tolerances.) A typical company today might be performing at the three sigma level, meaning they are experiencing one defect out of 16 opportunities. This would equate to about 67,000 defects per million opportunities. A "better" company might be at the four sigma level or one defect per 160 opportunities. Not bad, but still over 6,000 errors per million. A performance level of six sigma is equal to 3.4 defects per million opportunities - not perfect, but pretty close.

In general, Six Sigma is a philosophy that provides companies with a series of processes and statistical tools that lead to both increased profitability and quality - whether a company produces durable goods or services. Six Sigma is a long-term process that is intended to cause continuous improvement. These improvements cannot be accomplished by restructuring the company or simply spending a lot of money. Instead, Six Sigma quality requires perseverance, focus and dedication.

Six Sigma quality can be achieved through an ongoing combination of structured and systematic projects. Projects are categorized as:

- Transactional business process projects that extend across an organization
- Traditional quality improvement projects that solve chronic problems that span multiple functions within an organization

A company, organization or project that tries to achieve a Six Sigma level of quality should focus on the design of products, services, or processes. Six Sigma principles can be applied to many areas, including manufacturing, administrative and customer service. Six Sigma techniques help lower variability, which reduces the number of defects and the operating costs while increasing effective capacity. Six Sigma techniques can also be used to improve other areas, such as customer loyalty, which also helps the company's bottom line.

Skills

(Product: PMOStep Project Management Office Framework and PortfolioStep Portfolio Management Framework)

Skills are the personal traits or internal knowledge that a person uses to perform the responsibilities within his or her role. There may be personal, business, technical, and professional skills required for a person to complete his/her responsibilities.

Skills Inventory

(Product: PMOStep Project Management Office Framework)

A skills inventory is a snapshot of every person in your organization, the skills that they have today and some type of rating system that represents how strong each person is in each skill. The skills included can be technical, business-related, personal or professional. Typically, people rate themselves on a one through five scale stating how strong they feel they are in each skill level. After the person rates himself or herself, you could also have a second rating from his or her manager. You can gather other information, such as the last time the skill was used, and how many months or years of experience the candidate has in each skill.

The purpose of a skills inventory is usually two-fold. First, when you have a need for people with specific skills, the inventory shows you who the candidates are that have that skill. Second, the skills inventory can be used to evaluate whether your organization has the right mix of skills to continue to support the business in the future. If not, then the inventory gives you the facts you need to make decisions on which skills need to be strengthened in the future.

Small Projects

(Product: TenStep Project Management Process)

The definition of small projects covers many types of work. In most companies, these small projects are not viewed as "projects" at all. Your company may call these enhancements or discretionary requests. However, they have all the characteristics of a project - the work is unique, has a beginning and end date, results in the creation of a deliverable, etc. It's just that the work is small and so the project itself is small.

In many organizations, small work efforts are considered a part of the support or operations organization. Many of these small work efforts can fall under support because they originate with some type of problem or failure to a production process. Sometimes the failure is critical to resolve immediately, and sometimes the failure is minor and can be allowed to continue unresolved for a long time.

It can be hard to decide whether a small piece of work should be managed as a support request or managed as a small project. One distinction to look at is whether there is discretion in when the work is completed. If a problem arises that requires a fix to be performed quickly, the work is definitely support. If a problem arises that can be prioritized and worked on sometime in the future, it is considered a small project.

If work is classified as a discretionary small project, it does not diminish the criticality or the value of the request. It only means that there is discretion as to when the work gets done. For example, if a request is important enough, it may push to the top of the work queue and be started immediately. However, later an even more urgent request could come up that would require the other request to be put on hold. The nature of discretionary work is that it is subject to prioritization decisions. This is in contrast to true support work. If a production

process is down, or is producing inaccurate results, typically the problem needs to be resolved now, and cannot be stopped because of a discretionary request.

SMART Objectives

(Product: TenStep Project Management Process)

Well-worded objectives should be Specific (S), Measurable (M), Attainable/Achievable (A), Realistic (R) and Time-based (T). Having "SMART" objectives is a specific technique that you may want to follow. It is not mandatory that objectives be written in a way that they are "SMART".

- **Specific**. Make sure that the objective is built around one common idea. If the objective contains two or more basic ideas, split the ideas into separate objectives

- **Measurable.** The measure may be stated within the objective itself, but it does not have to be. However, there needs to be a clear sense that metrics could be established to validate whether the objective was achieved. For instance, for an objective that stated that you would like to provide a solution with "a maximum level of quality and a minimum number of errors," you might have difficulty defining exactly what constitutes "minimum" and "maximum." However, if the objective was to provide a solution that "met client expectations for quality and contained 50% fewer errors than the prior solution," you will most likely be able to measure your success. The first part of the objective could be resolved through a client satisfaction survey. The second part could be accomplished by tracking the errors and comparing them to the baseline of the older solution.

- **Attainable/Achievable.** You do not want to commit to objectives that you don't feel are achievable. If you think the objective is not achievable, rewrite it so that it can be attained. The business clients should approve the modification. The objective must also be within the control of the project manager and the project team. For instance, there may be additional work performed by the client that is related to your project. However, since this client work is not within the control of the project team it should not be listed as a project objective.

- **Realistic**. This is similar to the previous discussion on attainable/achievable. Here, you look beyond the theoretical and to the practical. You might say that an objective is achievable, but that there is only a small chance. In that case, the objective may not be realistic.

- **Time-based.** If possible, the objective should contain a time component, or else a time-component must be implied. For instance, an objective may state that you will "train the users in the new technology by no later than the end of the year." Even if the time-based nature is not explicitly added to the objective, the objective must have a clear end-date. For example, an objective that stated "performance will improve on a yearly basis for the foreseeable future" would not be well-written since it is not time-bound. Since the project, by definition, must have an end-date, all objectives must

have implicit, or explicit, end dates as well.

Software Change Management

(Product: SupportStep Application Support Framework)

You know how valuable the software applications are that run your company. These include your critical financial, marketing, purchasing, and manufacturing applications, as well as many others. What you may not realize is that just one complex application consists of hundreds, if not thousands, of individual software programs and components. These components must be tied together into a precise configuration for the application to work correctly. Further complicating the environment is that development work is usually done in teams. The larger and more complex the application, the more team members will be involved. At any given time, there may be developers enhancing existing components, building new components, and fixing other components that are not working correctly.

Think about the problems that can arise in this type of environment. First of all, in a complex environment, it's likely that components will be stored in the wrong place and will be hard to find when needed by the application or by developers. Components can be lost or deleted accidentally. It would also be easy for two people to be working on the same component simultaneously, which would cause one person's changes to be overridden when the second set of changes is placed into production. If problems arise in an application, it would also be difficult to determine exactly what has changed since it was last in use and ran fine.

The general purpose of software change management is to allow you to manage your production environment and ensure the control of changes to this environment. Some of the benefits of defining and adhering to change management standards and guidelines are:

- Protecting the integrity and security of source code.
- Enhancing client/IT partnerships by formalizing a process where the client approves systems changes before they are applied.
- Ensuring applications are not put into production prematurely or without authorization.
- Allowing components to be tracked so that you can see what the state of different versions is at any given time.
- Providing the ability to back out production moves if problems occur.
- Reducing the likelihood of negatively impacting other applications.
- Ensuring conformity to other related policies and standards.

The following processes are part of software change management:

- **Change Initiation and Tracking.** The process for initiating software changes, tracking the change request through all necessary approvals, and capturing an ongoing log of all changes.
- **Version Control.** A standard process to manage and control software changes.   Version control covers:

- o Protection of production software versions (as well as other versions) while modifications are made.

- o Capture of historical record of software retrievals and changes made.

- o Enforcement of a standard approval process.

- **Production Turnover.** The activities associated with promotion of software into production. This includes both the initial and all subsequent moves to production.

- **Software Distribution.** The distribution, logging, tracking, synchronization, and verification (of successful distribution) of software into the targeted production environment.

Solutions

(Product: TenStep Project Management Process)

The term "solution" is used to generically refer to the main client deliverables produced by any project. It is assumed that the completion of a project will result in a solution to a business problem or a business need. If you work in an IT application development group, for instance, the solution would be the business application software. Your project may produce other internal and external deliverables, but they are not considered the "solution". The solution is the main deliverable produced for your client.

Sponsor (Executive Sponsor and Project Sponsor)

(Product: TenStep Project Management Process)

The sponsor is the person who has ultimate authority over a project. The Executive Sponsor provides project funding, resolves issues and scope changes, approves major deliverables and provides high-level direction. He or she also champions the project within his/her organization. Depending on the project and the organizational level of the Executive Sponsor, he or she may delegate day-to-day tactical management to a Project Sponsor. If assigned, the Project Sponsor represents the Executive Sponsor on a day-to-day basis and makes most of the decisions requiring sponsor approval. If the decision is large enough, the Project Sponsor will take it to the Executive Sponsor. The Executive Sponsor or Project Sponsor is the person who puts forward project work during annual business planning process.

Stakeholders

(Product: TenStep Project Management Process)

These are the specific people or groups who have an interest or a partial stake in the products and services an organization provides. Internal stakeholders include management, other employees, administrators, etc. External stakeholders could include suppliers, investors, community groups and government organizations. Clients / customers are stakeholders as well. However, most stakeholders are not clients or customers. Stakeholder

needs must be taken into account when managing work in a portfolio or when executing a project. However, stakeholder needs are not as important as client needs. You cannot proceed without sorting out which people and organizations are clients and customers and which ones are stakeholders.

Standard

(Product: PMOStep Project Management Office Framework)

A standard is a *required* approach or way of doing some type of work, for conducting an activity or task, utilizing a product, etc. Standards usually apply to some type of product, whereas a policy usually applies to a process.

Statistical Process Control (SPC)

(Product: TenStep Project Management Process)

Statistical Process Control (SPC) techniques provide a data-based, objective way to determine whether your project is producing products within acceptable levels of quality. These techniques rely on testing or performing quality inspections on many products being produced by the project team. If your project is creating a small number of highly customized deliverables, SPC techniques may not work for you. However, if your project will result in the creation of many similar products, SPC may be a good way for you to determine if your processes are sufficient to produce high-quality products.

SPC also helps you determine if your processes are "in control". That is, you can determine if your processes are adequate to produce products with an acceptable level of quality on an ongoing basis. When the process starts to falter and produce products that do not conform to quality standards, the processes are designated as "out of control". SPC techniques will tell you as soon as possible when your processes are "out of control".

The philosophy behind SPC is that process output can be statistically controlled through process engineering and management actions. This approach helps project teams and companies to:

- Identify critical problem areas in a process early
- Reduce product variability
- Determine the capability of a process
- Optimize a process
- Determine the reliability of the product

Although SPC appears to be an easy and straightforward technique, its implementation can be complicated. It requires a common and consistent way to test products being produced, a

way to measure the results of the tests and a way to interpret the results to understand what is happening.

Steering Committee

(Product: TenStep Project Management Process)

A Steering Committee is usually a group of high-level stakeholders that are responsible for providing guidance on overall strategic direction. They do not take the place of a Sponsor, but help to spread the strategic input and buy-in to a larger portion of the organization. The Steering Committee is usually made up of organizational peers, and is a combination of direct clients and indirect stakeholders. An organizational Steering Committee would prioritize work for a portfolio and monitor the work during the year. A project Steering Committee would provide high-level direction and organizational buy-in for a project.

Strategic Change

(Product: PMOStep Project Management Office Framework and PortfolioStep Portfolio Management Framework)

Strategic Change is the final step in a portfolio management process, focused on improving the portfolio. You may need to redirect the goals of your portfolio as a result of a strategic change ordained by executive management. However, this is not likely to happen until management see and experience the results of the portfolio outcomes in the first place with specific reference to the benefits being realized. This clarity is the result of intermediate steps to effectively launch the products, achieve the intended benefits of the products, and measure business value provided as compared with what was intended. The ongoing management of the portfolio will include this monitoring, managing and measuring.

Strategy

(Product: PMOStep Project Management Office Framework and PortfolioStep Portfolio Management Framework)

There may be many ways to achieve your mission and arrive at your vision. A strategy is a high-level set of directions that articulate how the organization will achieve its mission and move toward its vision. A Strategic Plan provides guidance on the types of projects and activities that should be funded and executed. Strategy defines how you will do things over the long-term, whereas tactical plans show how you will do things over the next three months to a year. A typical set of strategy statements takes into account a one-to-three (maybe five) year planning horizon.

Strategy is very important for setting a context or framework for the work that the organization will undertake over the life of the Strategic Plan. In general, no projects (or any work) should be undertaken that do not align to your strategy, since your strategy describes how you will perform your mission and attain your vision.

Stress Testing

(Product: LifecycleStep Project Lifecycle Process)

The purpose of stress testing is to see how the system behaves when it receives volume higher than the requirements. (On the other hand, performance testing is designed to ensure that the system performs as expected against low, normal, and high volume requirements.) For instance, you might expect no more than ten users on you software solution at one time. Your performance test might simulate one, five and ten users. A stress test, however, might test with twenty simultaneously? Likewise, if you expect your website to have no more than 1000 hits per hour, you could test to see what happens if you receive 2,000 or 5,000 or 10,000 hits per hour?

The stress test shows how your system holds up against the unexpected. To be sure, you would expect system performance to degrade if the resources are stressed. But do they crash and burn? If they do, at what point do they do so? The question then is whether this break point is acceptable. If you expect 1,000 transactions per hour, it may be acceptable for the system to break if it has to process 10,000 in an hour. However, it may not be acceptable if it breaks at 1,500 transactions per hour. In many cases, stress testing highlights flaws in your technical architecture and may point out the need for upgrades to hardware, software, or tools.

Subject Matter Expert

(Product: SupportStep Application Support Framework)

The Subject Matter Expert (SME) is a person with superior knowledge of a product, service, business function, process, etc. SMEs can be relied upon for their subject matter expertise without having to perform a lot of independent research on a particular subject.

Suppliers / Vendors

(Product: TenStep Project Management Process)

Although some companies may have internal suppliers, in the TenStep Project Management Process suppliers and vendors always refer to third party companies or specific people that work for third parties. The terms "suppliers" and "vendors" are used synonymously and refer to third party individuals or companies that are providing products and services to your organization or to your project. They may be subcontractors that are working under your direction or they may be supplying material, equipment, hardware, software or supplies to your project. Depending on their role, they may need to be identified on your organization chart. For instance, if you are partnering with a supplier to build a critical component, you

probably want them on your organization chart. On the other hand, if there is a vendor supplying a common piece of hardware, you probably would not consider them a part of the team.

Support

Support is work that has to be done to keep your current production processes working effectively and reliably. In general, the support organization produces very few deliverables. Your support group may produce deliverables, but when you do, you are typically performing in an enhancement, project, or management capacity. In fact, it might be argued that the support function actually produces no deliverables. In general, support services can include:

- Responding to emergencies
- Answering questions / assisting clients with the application
- Cross training on production applications
- Assisting with normal weekly, monthly, quarterly, yearly processes (i.e. financial closeout)
- Responding to environmental changes
- Meeting that you attend related to support and business applications
- Planning associated with support
- Ongoing small administrative items such as time reporting and metrics capturing
- Planning and executing disaster recovery exercises
- Planning and executing records retention policies

Support Dispatcher

The main purpose of the Dispatcher is to assign problem tickets and problem requests within the group. Your organization may or may not have a Dispatcher role, depending on how you assign support calls and how your clients contact the support staff. If the clients are allowed to come directly to the support staff when they have questions or problems, then the Dispatcher is not needed. If you have support call tracking software that can assign problem tickets to each primary and backup support person, then you may not need a Dispatcher either.

The Dispatcher role is important if you have a help desk that assigns problem tickets to a specific group, not necessarily specific people. If the calls are assigned to a specific group, then the Dispatcher monitors the problem queue for tickets assigned to your team. When a problem is

found, the Dispatcher specifically assigns the problem to a person in your group.

Another time you might need a Dispatcher is when your group has its own support phone line. If you have a specific support line that people call for help, the person who picks up the phone is probably acting as a Dispatcher. He or she may be entering the call into problem tracking software, but he or she is also more than likely assigning it to someone on your team. That is the main responsibility of the Dispatcher.

The Dispatcher role does not have to be full time. In many groups, there is a primary and backup Dispatcher, and the role rotates among team members on a weekly or monthly basis. When it is your turn, you would monitor the support queues and assign the calls to members of your team. When it is not your turn, you don't need to worry about it.

Tangible Benefits

(Product: PortfolioStep Portfolio Management Framework)

Tangible benefits are those where you can easily tie a specific numeric value. For example, if your project's projected benefit results in eliminating two positions, you should be able to easily make an estimate as to the total cost savings. Likewise, if your project will result in a 10% increase in product sales, you should be able to determine what that revenue increase looks like.

Technical Systems Design

(Product: LifecycleStep Project Lifecycle Process)

The Technical Systems Design is a deliverable that provides the specific technical information needed to construct a solution. You should be able to provide the Technical Systems Design to the people that are constructing the solution and they should be able to proceed without asking any more questions (theoretically). Some of the sections that are defined in the Technical Systems Design include the logical databases, technical architecture, security, programs, screens and reports. Notice that some of this detailed information was first developed in the Conceptual Systems Design. That is why that document helps accelerate the completion of the Design Phase, even though it takes more time to create in the Analysis Phase.

Technique

(Product: TenStep Project Management Process)

A technique is a well-defined procedure or way of doing something used to accomplish a specific activity or task. More than one technique may be available for accomplishing a specific activity or task.

Template

(Product: TenStep Project Management Process)

Templates are pre-existing forms that include standard formats, text and spaces to fill-in-the-blanks with standard information. Templates save time since each person does not have to create the document format on their own. Templates also allow information to be presented in standardized and recognizable formats for the reader.

Testing Plan

(Product: LifecycleStep Project Lifecycle Process)

The Testing Plan is where you define the specific details for how you will perform testing on your project. If you created a higher-level testing Strategy, the Testing Plan provides the real detail needed to successfully perform your testing function. The Testing Plan is where you define the types of tests that will be performed, what the test scenarios look like, what the expected results are, how you will track errors, who will test, where will the testing will take place, etc. Creating the Testing Plan during the Design Phase allows you to be prepared for testing before it begins and gives you confidence that your solution will be tested appropriately. If you create a comprehensive Testing Plan, you will find that all the tactical testing decisions have been made. All that is left is to execute the plan you have just created.

Testing Strategy

(Product: LifecycleStep Project Lifecycle Process)

The purpose of the Testing Strategy is to define the overall context for the entire testing process on your project. The strategy is different depending on the specific characteristics of your solution. In many respects, this is the most important part of the testing process, since all future testing decisions will be made within the overall context of the strategy. The basic parts of the Testing Strategy are as follows.

- **Testing (business) risks.** These are high-level business and project risks that will impact the overall testing strategy. The risks can be classified in terms of high, medium, and low, depending on the nature and impact of the problem. For each high and medium risk, identify what elements in the overall testing approach will help ensure that the potential problem does not occur. For instance, the risk of doing business on the Internet may drive the need for rigorous system tests of firewalls, technical architecture and security. All of these risks should be identified in the context of your project risk management plan and any activities in the risk plan should be moved to the project schedule.

- **Testing approach.** Describe the testing process at a high-level, including how you will conduct unit testing, integration testing, system testing, and acceptance testing. (If your project is large enough, each of these might be its own section.) This is where

fundamental decisions are made with regard to the type of testing that makes sense for your project. For instance, if you are implementing a packaged solution, the approach may start in system testing, with the vendor providing close support. If you are doing iterative development cycles, the testing approach will reflect this overall development lifecycle. For system testing, define the major testing events such as stress testing, security testing, disaster recovery testing, usability testing, response time testing, etc.

- **Testing milestones.** This section gives the reader a preliminary overview of the testing timelines. Obviously, since this document is created in the analysis phase, these dates are subject to later revision.

- **Testing environment.** Think through the technologies and facilities needed for the testing process. If the overall testing environment needs are understood up-front, it will be easier to break out the specific activities required to put the environment in place. In addition, some parts of the environment may need to be planned for and acquired well in advance.

Depending on your project, there may be other high-level sections to include such as testing objectives, testing assumptions, testing environment, testing organization, testing tools, effort and cost estimates, etc.

Tiers

(Product: LifecycleStep Project Lifecycle Process)

Building a software application in tiers allows you to separate major functions into separate and standalone areas. Tiers allow you to isolate certain functions and allow for greater flexibility to scale a solution based on changing requirements. Web solutions, for instance, are typically designed in three tiers. The user interface tier (client tier) is represented by the browser and client-side scripting/coding on the client machine. The webserver houses the server-side code (middle tier), and the data resides in database tables on a third platform (data tier). In this way, if you want to change the way the user windows appear, you can do so without changing the entire application. Likewise, let's say you have to move the database to a larger machine. If your data resides in a separate tier, this expansion can be accomplished without having to change other tiers (program code and user interface).
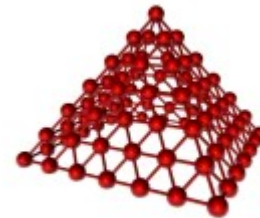
Timeboxing

(Product: TenStep Project Management Process)

In a perfect world, project completion dates would be derived based on the amount of work to be done and the number of resources available. As you know, that is not always the case. Sometimes there is an arbitrary or very valid date by which the work must be completed. For instance, the end date may be determined by a government regulation, a scheduled event or to coincide with another company initiative. This situation is referred to as a timebox, meaning you have a fixed amount of time to get the work done and the end date is "boxed" in.

There is nothing wrong with having a fixed end date. It provides a sense for the business value of the project and gives everyone on the team a sense of urgency and focus. There may be a problem, however, if the project manager and team do not think they can get the work done by the deadline. In that case, the project manager needs to raise this as an issue.

Tolerances

(Product: TenStep Project Management Process)

When you manage the project schedule and budget, you usually do not need to be hit every estimate to the minute or to the dollar. Your client does not expect that level of accuracy in your project schedule and budget management and they are not interested in knowing whether your project is one hour ahead or behind schedule at any given time. This ability to be "close enough" is referred to as your tolerance.

As the project manager, you should have some sense for what the tolerance level is for your project. For example, let's say you are updating your project schedule and you realize you have overspent your budget by $1,000. Should you raise an issue or a budget risk? Should you inform your client? It depends on your tolerance level. If you have a $10,000 budget, you should probably be concerned, because you are at risk of going over budget by 10%. If your project has a one million dollar budget, then the thousand dollars is not material at all. (In fact you would be a hero if you delivered within $1,000.)

Use common sense and work with your client on the tolerance levels for budget and deadline. If you stay within the tolerances, you are fine. If you go outside those limits, you should be concerned.

Total Cost of Ownership (TCO)

(Product: PortfolioStep Portfolio Management Framework)

TCO allows you to estimate the entire costs associated with a project or product over the lifetime of the product. For instance, if you were deciding whether to purchase new workstations for your company, you could just focus on the purchase price. However, a TCO calculation would allow you to factor in the total cost of owning and running the workstations over their useful life. A TCO calculation, for instance, would take into account things like total helpdesk costs required to support the workstations, electrical power requirements, typical hardware and software upgrade costs, etc. The

Total Cost of Ownership might be several times the cost of the initial hardware purchase.

Traceability

(Product: LifecycleStep Project Lifecycle Process)

Traceability refers to the ability to trace, or track, requirements throughout the lifecycle and into the final solution. Tracking requirements through the project ensures that all requirements are considered as a part of design, all requirements are built into the solution, all requirements are tested and all requirements are implemented in the final solution. Likewise, the process also ensures that features and functions are not designed and built into the final solution that are not a part of the agreed upon requirements.

Training

(Product: PMOStep Project Management Office Framework)

Although there are many ways to pass knowledge from one person to others, the term "training" usually implies that there is some formal set of training material, exercises, learning objectives, etc. You may have an instructor that is training a classroom or students. You could also have a situation where one person is attending a computer-based training class. In both cases, the training material is prepared ahead of time, the presentation is structured and the participants should realize that they are receiving training.

Training Strategy

(Product: LifecycleStep Project Lifecycle Process)

The purpose of the Training Strategy is to define the overall context for training, including who should be trained, what they should be trained in, when the training should take place, etc. In many respects, this is the most important part of the training process, since all future training decisions will be made within the overall context of the strategy. The basic parts of the training strategy are as follows.

- **Training overview**. Outlining the training overview will provide the team with insight into the various methods that will be used to introduce this new system to the user. Also, the overview will provide the level of effort needed to complete the necessary training.

- **Training objectives.** Determine the key objectives of the training program. These objectives should focus on the end result of the training, not on building the training classes themselves. For instance, two objectives might be project managers must be able to adequately define their projects, and communicate their work through the creation of a Project Charter. Functional managers must be able to perform a quality assurance role, and know how to independently determine the status of projects in their organization. The objectives should describe the kind of performance that is expected as a result of mastering the skill.

- **Overall scope.** Define the scope of training. This scope should define the organizations that will be involved, the types of people that need to be trained, the types of training to be offered, etc.

- **Delivery alternatives.** Discuss the different options that will be considered. For instance, if you will only look at internal instructor-led classes, state so here. If you will consider external classes, note that here as well.

- **Approach.** This section includes the basic types of training opportunities to be offered, the intended audience for each, and any training prerequisites. Given your objectives, priorities and overall scope, you should be able to describe the general approach to building the curriculum. For instance, from a timing perspective, it is always better to take training close to when you have an opportunity to apply to new skills. If there are multiple classes to offer, describe whether the order of the training matters.

- **High-level costs**. Estimate the cost of training at a high-level. This is more important in the Training Strategy since there may be other organizations and other companies involved. Training is important, but can also be costly, so a high-level estimate of cost should be identified and agreed to.

Training Techniques

(Product: PMOStep Project Management Office Framework)

Keep the following techniques in mind when building instructor-led training content:

- Include the learning objectives in the content of the class so that the attendees can tie the content they are learning with the overall learning objectives of the class.

- Make the slides at a bullet point, summary level. Slides that contain too many words are not effective for an instructor-led class.

- Keep a consistent format for each slide to help the attendees build familiarity and comfort with the material.

- Design the material to allow for as much attendee feedback as possible. Attendees quickly lose focus if the instructor speaks for too long.

- Add pictures, charts, graphs and clip-art to the training material where appropriate. Again, this content makes it easier for the attendees to focus on the slide and allows the instructor to teach using visual models rather than just words.

- Consider culture and diversity when preparing the content, especially if the class will be taught in international locations.

- Develop handouts to allow attendees to take material with them.

Training Testing

(Product: LifecycleStep Project Lifecycle Process)

In most cases, the first time you deploy training is actually in a live environment with real users. However, if possible you should try to test out the material first. For instance, you may offer training first to an internal group, or even the project team. Another approach is to first offer the training as a pilot test to a group of selected users. This "testing" allows you to validate the content of the training and ensure that it flows well. This includes the base training content as well as any exercises and case studies. Sometimes exercises that seem great on paper don't work well in the actual class.

The initial testing of the training content also helps prepare the instructors so that they will be more comfortable delivering the training to the rest of the organization. The initial test is an opportunity to make sure you have the right supplies, the right test facility, the right mix of attendees, etc. If you are going to provide webinars, other distance learning, or computer-based training, you can test the technology and the delivery at this time.
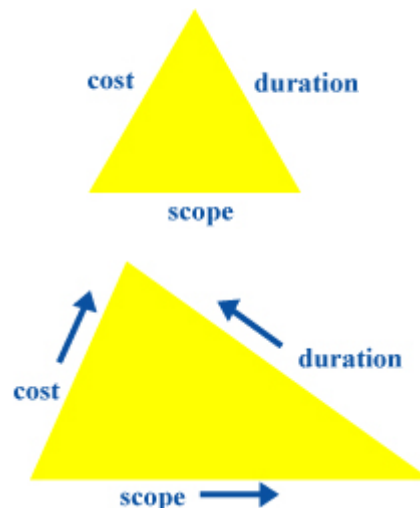
Triple Constraint

(Product: TenStep Project Management Process)

At the end of the upfront definition and planning process of your project you should have an agreement with your sponsor on the work that will be completed and the cost and duration that are needed to complete the work. These items then form a concept called the "triple constraint". They key aspect of the triple constraint is that if one of the three items change, at least one, if not both, of the other items need to change as well. (The triple constraint is actually written a couple similar ways. The cost item can also be referred to as effort, which makes more sense if the labor costs are all internal and if there are not non-labor costs. Sometimes, the scope item is referred to as quality, which then focuses on delivering a certain quality level for a certain cost and duration. This is a more narrow aspect of the triple constraint, but the general concepts still hold true.)

This concept is easy to visualize if you think of the triple constraint as a triangle, with the sides representing cost, duration and scope of work.

If the scope of work increases, the cost and / or deadline must increase as well. This makes sense. If you have more work to do, it will take more cost (effort) and perhaps a longer duration. (Likewise if you reduce the scope of work, the cost (effort) and / or the deadline should decrease as well.)

If you are asked to accelerate the project and complete it earlier than scheduled, it would also be logical to ask for less work. However, if you are asked to deliver the same work for less duration, the third leg of the triple constraint must increase to maintain the balance. This should also make sense. You will need to increase costs (effort), perhaps by working overtime hours or perhaps by bringing in more resources to complete the same amount of work earlier.
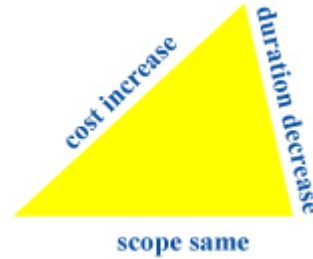
Unified Modeling Language™ (UML)

(Product: LifecycleStep Project Lifecycle Process)

The Unified Modeling Language (UML) is a standard modeling language used in many methodologies, especially those that use object oriented techniques. UML can be used to model (or diagram) almost any entity, including programs, business processes, hardware, networks and architectures. It can be used to provide a common foundation for modeling in your organization since anyone who needs to develop models should be able to utilize it. UML can be used for process models in the Analysis Phase, but it can also be used in the Design Phase as well to model the specific technical design and structure of programs and other components.

Unit Test Reviews

(Product: LifecycleStep Project Lifecycle Process)

A unit test review is similar to the code review in that the owner explains how he/she has tested the code and what the results are. If the program has already been unit tested, this test review could be done at the same time as the code review. The reviewers look for testing flaws, tests that were missed and errors in the test that were not discovered by the owner. Any errors found in the unit test process will save countless hours compared to finding the error in the testing process or after implementation. The overall format of the meeting is similar to the code review meeting.

- Circulate the program code and test results ahead of time.

- Hold the unit test review meeting.

- Explain the unit testing process.

- Explain how the unit test cases (data) were chosen. This might be a combination of black box and white box test cases.

- Explain how the test results were validated.

The reviewers should challenge the explanations when anything sounds incomplete or unusual. The program owner needs to prove that the program components are complete and correct. The results of the meeting should be documented, along with any action items. If there are any outstanding questions or action items, the owner needs to perform additional tests to satisfy the conditions. Then, a second meeting can be held to validate that the prior test results are still valid and that all outstanding items from the first meeting have now been successfully addressed.

Usability Testing

(Product: LifecycleStep Project Lifecycle Process)

You can have a solution that meets all the features and functions asked for by the client that is still difficult to use and difficult to learn. Many of the features of usability do not come directly from the business requirements. You may get usability input from the clients in the Analysis Phase if you create a Conceptual Systems Design. Otherwise your Designers should make usability decisions in the Design Phase. While most project teams do not include human factors experts, there are many common sense techniques to ensure that a system is easy to navigate and easy to understand. A separate usability test can be designed as a part of the system test to validate that the end users understand and use the system to its fullest.

In general, you do not want IT people to perform the usability tests. The users, or people who have not seen the application, are the best people to use. Since this is a subjective test, you may choose to have the users utilize the solution and provide their opinion on usability through a survey. During the usability test, users should access the system and carry out

scenarios that mirror their normal jobs. Then, using a one through five scale, you can survey them to see how satisfied they were in the following areas:

- Ease of navigation from screen to screen.

- Ability to spot necessary navigation boxes and buttons.

- Overall complexity of the screens.

- The color schemes used on the screens.

- Error messages and the ability to understand what was required to correct errors.

- Availability and clarity of online help.

- Sharpness of graphics, charts and graphs.

- Consistency between different screen sizes, browsers and other hardware types.

- Consistency of grammar and syntax. For instance, if you place a period at the end of some items in a bulleted list, they all should have the period. (Or else they all should not.)

- Consistency of fonts, font sizes, font color, etc.

As you can see, usability is mostly an online concern, but you can perform usability surveys for batch reports as well. These and other questions can help determine if the application is usable or not. If survey questions are rated low, ask for specific examples of screens and reports that the users did not like. Performing usability testing and correcting poorly designed screens and reports can go a long way toward ensuring the application will be successfully adopted by the clients when it is implemented.

Use Cases

(Product: LifecycleStep Project Lifecycle Process)

Use cases are an alternative technique used to document requirements. (In fact, they can be used for other purposes as well.) Use cases assume that you have some system and you have people that interact with the system. In some literature, the people interacting are referred to as "actors." Use cases describe scenarios, or stories, where the actors interact with the system in certain ways to achieve some desired result. The thought is that if you describe all of the ways that people interact with a system, including the expected results of the interaction, you will end up with a complete set of functional requirements. Use cases are especially popular with newer "Light" (Agile) development processes.

User View

(Product: LifecycleStep Project Lifecycle Process)

The user view is the way the data is presented to external parties. This is also called the external view. These external parties may be users of the solution, but they can be the programmers as well. When people need to access the data, they describe the elements they need to see and how they will use the information. However, they may get access to the data through specialized user views. These views may contain only the data needed by that person, without showing the rest of the elements that may also be in the tables. If tables need to be related (joined) to create a complete picture, the view may have these elements joined already.

User's Manual

(Product: LifecycleStep Project Lifecycle Process)

The purpose of the User's Manual is to provide the end user with all the information they will need to use the solution. While the clients and users may receive training on a new system, it is normally not until they utilize the solution that they will start to ask the detailed questions on features and functions. Calling the help desk may be an option, but the chances are that the help desk is not going to be able to answer the specific questions regarding how the solution works. The better (and less expensive) option is to provide detailed instructions that allow users to solve problems on their own. A good User's Manual will provide users with the information they need to use the solution as it was designed and should help them answer detailed questions that come up during the course of using the solution. If the users can resolve questions on their own, it will save them time, and will save time and effort from the help desk and the support staff.

The User's "Manual" could be created in a variety of forms, including a hard copy manual, a portal of frequently Asked Questions (FAQs), online discussion forums, and/or as online Knowledge Bases.

Users

(Product: PMOStep Project Management Office Framework)

Users are the people who will actually use the deliverables of the project. Sometimes these people are also involved heavily in the project in activities such as defining business requirements. In other cases, they may not get involved until the testing process. Sometimes you want to specifically identify the user organization or the specific users of the solution and assign a formal set of responsibilities to them. Sometimes users are inside and outside of the client organization. For instance, if your company has a time reporting system, the client organization might be the Human Resources Department. However, the users would include people from every organization that used the time reporting system.

Value Proposition

(Product: PortfolioStep Portfolio Management Framework)

Value Propositions are short documents that describe the costs and benefits of implementing an idea. A Value Proposition is part of a portfolio management process of identifying and prioritizing work. The Value Proposition provides some preliminary information about a proposed body of work. Although the Value Proposition is created at a high-level, it contains enough information so that your organization can determine if it is worth pursuing or if the work should be dropped. If the work is worth pursuing, a more detailed Business Case can be created next. A Value Proposition contains the following information:

- **Name of the work.** This is a one-line name, and the names can be standardized for similar types of work if you choose.

- **Description of the work.** A brief description of the work. Keep this to one paragraph maximum, but also make sure that it provides enough information so that others can understand the work that is being proposed. You may have standard descriptions for operations and support, discretionary, management and leadership and overhead.

- **Work category.** Specify whether this work is operations and support, project, discretionary, management and leadership, overhead or non-labor.

- **Balancing categories.** The balancing categories were defined early in the Definition process. For each balancing category that you defined, specify how this work is categorized. For instance, if you have a balancing category for "Risk," identify whether this work is high, medium or low. If you have a balancing category for "Internal / External," identify whether this work is internal or external.

- **Estimated business benefit.** Describe the business benefit at a high level. If you have any hard numbers, include them here. Otherwise, describe the business benefit in terms of continuing operations, process improvement, new products or markets, increased revenue, cost reduction, increased customer satisfaction, etc. If the work involves infrastructure or increased internal capability, the business benefit may be indirect.

- **Estimated effort and cost.** The estimating is done in two parts - high-level and more precise. The requirement now is for a high-level estimate. However, if you have more detailed, hard numbers, disclose them now, since this will save you some time in the Prioritization step. For instance, you may have a sense for the cost of operations and support work based on the current and prior year's costs. Project work may be more difficult to estimate, but there are some techniques to utilize in creating an initial high-level estimate. Your estimate should provide a sense for both the labor and non-labor costs. The labor costs will be reflected in your estimate of effort hours.

  When you are putting together the Value Propositions, you should expect a cost estimate to be within plus or minus 100%. In other words, if the work ultimately costs $100,000 to complete, your estimate at this point might be anywhere from $50,000 to $200,000.

This gives you an order of magnitude estimate and tells management that the effort won't be $10,000 and it will not be $500,000. You may need to determine an estimate for labor hours, but that will ultimately be converted to a cost for the Value Proposition. Likewise, you don't have to estimate duration at this time. Much of the duration estimate is based on knowing how many resources are being applied, and you don't have the ability to make that decision yet.

- **Change from current year.** If this work exists in the current year, provide the current cost (or projected cost) and the reason for any change. This will be applicable for work categories such as operations and support, discretionary and management and leadership. If the proposed cost and effort for next year is different than the current year, justify the reason for the change. If the costs are the same, just state so. If the work did not exist last year (for instance a project), state that as well.

- **Alignment.** Validate the alignment by specifying how this work contributes and aligns to your organization goals, objectives and strategy.

- **Is the work required?** Specify whether you feel this work is required. For instance, work may be required for legal or regulatory reasons, even if it is not aligned and does not have business benefit.

- **Urgency / consequences of not performing this year.** Describe the consequences of not performing the work. In many cases, this is just as important to know as the business benefit and alignment. Some work is very valuable to the organization, but it is not urgent. Based on priorities and available funding, some very beneficial and aligned work may need to be postponed until a future year. It might make sense to also comment about the consequences of not receiving the full funding authorization for this year.

Vision

(Product: PMOStep Project Management Office Framework and PortfolioStep Portfolio Management Framework)

The vision describes a state that the organization is striving to achieve in the future. It is very general, but it gives a sense of what the organization would be doing and how it would look if it were perfect and existed in a perfect world. Like the mission statement, this is usually one sentence with perhaps a few bulleted points.

White Box Testing

(Product: LifecycleStep Project Lifecycle Process)

In white box testing, you look at the structure of the internal software code and try to create test data that will exercise all of the code (or as much of the code as possible). For instance, whenever you have a conditional logic statement (IF-THEN-ELSE), you want to generate a test case that will ensure that each branch of the code is executed. Of course, then you need to validate that the resulting output is as you expected. Likewise you can test to ensure all possible functions, subroutines, objects, etc., are called and that the results are as expected.

One of the values of white box testing is that it exercises sections of code that may not get tested otherwise. For instance, it may take a certain combination of inputs to result in certain sections of code being executed. Using black box techniques may not result in the right set of inputs. However, by looking at the code, you can see what set of events are required to exercise a set of instructions, and then you can construct a test case around that scenario.

Work Breakdown Structure (WBS)

(Product: TenStep Project Management Process)

The purpose of the Work Breakdown Structure is to capture all the detailed elements of work required to complete the project. Sequencing is not important at this time. This process of breaking larger work components into smaller work components is called "decomposition".

The process for building the WBS is as follows:

1. **Break the project into lower level "chunks of work".** First determine the large chunks of work that must be completed for the entire project to be completed. At this point, it does not matter how you define the large chunks of work. It is only important that all the work is identified at the end of the process.

2. **Evaluate each lower element of the WBS.** Check each lower level component to see if it meets the following two criteria.

   - Is the effort required to complete the work component less than your estimating threshold?

   - Do you (or someone on your team) understand the detailed work required to complete this work component? The detailed work components on the WBS will ultimately be moved to the schedule. You don't want to have activities on your schedule that no one on your team fully understands.

   If you understand the detailed work required to complete the component and if the estimated level of effort is smaller than the estimating threshold you do not need to break the component down further.

3. **Continue to break down each component as needed.** Work components that require more effort than the estimating threshold, or work components that you do not fully understand should be broken down further.

As you break the work down, you are ultimately going to create activities. The detailed activities from the WBS are what get carried forward to the schedule.

This process of breaking the work components into a lower level set of components should continue until all of the work components are represented as granularly as necessary to ensure that no activities have estimated effort larger than the estimating threshold, and that you understand the work.

The entire team can collaborate on this exercise. For the most part, the Work Breakdown Structure technique can always be used as the starting point for creating a project schedule from scratch. If you (and others) do not know enough to create a WBS for the project (or at

least for the first three months of the project), you probably are not in a position to start the project anyway. In that case, you may want to only define a project for the analysis portion of the project. When the analysis portion is complete, you should have enough information to define the rest of the project.

Workload Forecast

(Product: PortfolioStep Portfolio Management Framework)

On an ongoing basis, usually monthly, the Portfolio Manager and senior leaders should get together for a planning session. This meeting should be scheduled at the end of the month or the very beginning of the month. The workload forecast is the process you use to look at each person in the portfolio and estimate his or her workload for the next two to three months. This is vital to ensuring that all your people are busy and that the critical work on the team is getting done. Even though there is usually enough work for everyone, you need to make sure that you know what is most important and that the staff is focused on completing the highest priority work first. The workload must include all the types of work that your group works one. This includes projects, support, discretionary requests, and any projects that are assigned. Don't forget to add vacation, training, holidays, management time, etc. to get a complete picture of the next three months for each person. A simple spreadsheet can work well, with people across the columns and the potential work activities on the rows.

During the first pass, you would estimate and categorize the workload for each person for the next three months. After the first pass, you need to review everything again to ensure that everyone is fully allocated and that the highest priority work is being worked on. You may find, for instance, that some people have too much work allocated and some people do not have enough. You will have the information you need to balance the workload between these people. If the skills are not interchangeable, you will need to stretch out the work of the over allocated people, and work with the client to assign high-priority work to the under allocated people. If not, then adjust the forecast accordingly. You should be able to estimate the work for the next month (or current month if you meet at the beginning of the month) pretty precisely. However, you will be less accurate the further you go out in the future. If you estimate the work over a three month window, some of the estimates for the second and third month will be little more than guesses. However, if you find that people do not have enough work allocated two or three months in the future, you will have an opportunity adjust the plan to add high priority work to the workload forecast.

After the workload forecast meeting, the managers must pass the information to the rest of the group so that they know what the priorities are. They should know what work has been assigned for the most current month so that they do not take on other, lower priority work instead.