

# Project Management 101

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**C O N N E X I O N S**

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# Becoming an Accidental Project Manager<sup>1</sup>

## Congratulations... you're the project manager!

NOTE: The following is based on, and adapted from, the premise of *The Education of Jerry* by J. Davidson Frame in *Managing Projects in Organization*, John Wiley, New York (1995).

John picks up the phone before the second ring. It's his boss, Mike Johnson. "John, I'd like you to stop by my office right after lunch today."

John is not really sure why the boss is calling him into his office, which makes for a long lunch hour. He knows he's been doing a good job lately. As a matter of fact, he knows that he's probably the most technically capable person in the group. John's mind begins to race. . . . Maybe it's an award? Could it be a promotion? Countless positive and negative scenarios run through John's overworked mind until one o'clock finally rolls around and he cautiously enters Mike's office.

"John, I've got some great news for you," Mike begins. "As you know our company is developing a business-to-business (B2B) e-commerce system. As part of that initiative, I'd like you to explore the possibility of integrating our purchase order process into the B2B e-commerce system."

Before John could say anything Mike continued, "Congratulations, John, I'm assigning you as the project manager. Use anyone you need to help you; the important thing is to give me a report on your findings within a month. Your preliminary investigation will give us an idea of how we should go about computerizing the order processing function at BizNex Inc., and we need that information in time for our next quarterly executive meeting."

John was delighted with being made the project manager. The B2B project was the largest BizNex Inc. had ever implemented, and the order processing subproject was one component of the larger B2B project.

Once developed, the B2B system would enable BizNex Inc. to establish seamless connections with its vendors. Although BizNex Inc. already used computers in its order processing system, the bulk of transactions entailed manual interventions. This caused the order fulfillment function to operate slowly and led to errors because the manual interventions were error prone. With the new B2B system, customers would enter orders using the internet. Once captured by the B2B e-commerce system, the orders would be processed entirely by the computer.

This project provided John with his first real management experience. He was hired by BizNex Inc. straight after completing his MBA degree at Rice University. During his first two years at BizNex Inc., he was assistant to Mike Johnson, Vice President of Operations. Despite the high profile of his job and the exposure it gave him to high-level decision making within the company, John felt that he wanted to become more involved in the decision making process. With the order processing subproject, he was being given something tangible to do with significantly more responsibilities.

John determined to do a good job on his project. He put together a task list. From his experiences since leaving college he knew it was important to assemble the "Project Staff." After careful thought he decided

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<sup>1</sup>This content is available online at <<http://cnx.org/content/m31436/1.3/>>.

he needed a business analyst, a procurement specialist, an internet expert, an e-commerce expert, a logistics expert, and a representative from each of the company's five divisions. He figured that he and the business analyst would be the only full time resources on the project. However, the other team members would need to make a fairly substantial commitments to the project if it is to be completed in a month. He decided that each would have to dedicate 25% of their time to the project.

Since there would be five divisions represented, John planned that each of the five divisional representatives would write a section of the study, detailing the impacts of the order processing system on their operations and defining whatever order processing needs they have. The business analyst would capture and document the business requirements and write the technical portions of the report. John's function would be to coordinate the efforts of the others and to integrate all the pieces into a cohesive plan.

As John started to put his team together, he immediately ran into trouble: he was unable to get a business analyst assigned full time to the project. Because his division was in the midst of developing the B2B system, all business analysts were already over committed. John went to his boss, Mike, with his problem, but was simply told that he would just have to make do with the resources available on a day-to-day basis.

John thought his luck was changing when he tried to obtain the procurement specialist for his project. After several enquiries someone told him he should talk with Doug Black, who worked in the contracts and procurement department. Doug was two months away from retirement so his workload was being reduced. John reasoned that one month assignment on his project would fit in with the plans to ease Doug into retirement. As a consequence Doug was assigned full time to the project to help pick up the slack of not have a business analyst on the project.

John next approached the information resource manager located in the Information Technology division and told him of his need for an internet specialist and e-commerce expert. The resource manager immediately assigned Sara Stone to help John with internet matters. Unfortunately, with no internal e-commerce system experience, John was told that he would have to go to an outside consultant for the e-commerce expertise needed.

The varying degrees of success John had had so far continued when he tried to recruit the representatives from the different divisions. The vice president of the information technology (IT) division, Sam Nelson, was nothing like what he hoped for. His request for assistance was met with an uncomfortable silence. A clearly upset Sam said, "I don't fully understand why you and Mike are playing the lead role on something like this. Building an order processing system is basically an information technology chore and should be left to the IT experts. I've had my team looking into the matter of automating the order processing system for months, and now you come in here telling me what to do." He dismissed John saying that he would "look into things personally." John noted that he had specifically not indicated that he would provide any cooperation. In contrast, John had a good reception from the finance division; the vice president of finance, Lynn Waters, announced it was about time BizNex Inc. entered into the twenty-first century and said she would be glad to assign someone from her office to help John on the project.

Until now, all of his experience at BizNex Inc. had been quite friendly, this was a side of the business he had not seen before. As he got back to his office, he didn't have any time to consider the implications because Doug Black knocked on his door.

"Listen John," Doug said rather sheepishly. "As you know, I have just under two months until I am out of here. I'd like to help you on this project of yours, really I would. I am sure it is important. But let me say I really don't know much about computers and think order processing is horridly dull. I don't see why I should put too much effort into something that won't effect me. So while I'll work with you, you won't expect too much will you?"

All of this happened on the Thursday, just three days into the project. To get the project moving, John tried to arrange a kick-off meeting of all project staff at nine o'clock the following Monday. Since Sam Nelson's office (IT) had not assigned a representative, it would not be represented. The finance division representative said he thought it was a great idea, but he would be out of town throughout the week so could not attend. The other project staff members said they would attend the meeting, but John got the impression they were not happy about it. Only Sara Stone, the internet expert, sounded interested. John wasn't sure what he would do about getting the e-commerce expert. He would have to talk to Mike Johnson

about it.

All through the weekend, John prepared for the meeting. He put together a five page preliminary position paper, identified milestones the team members would have to meet, created guidelines for the activities to be undertaken and read several journal articles on Internet Technology and online order processing. On Monday at nine o'clock, John arrived in the conference room and found it empty. By nine-thirty, only two other project team members had shown up. Conspicuously absent were Doug Black and Sara Stone, both of whom had assured him they would be there.

Without accomplishing anything, John closed the meeting and returned to his office. On his voicemail he found a message from Sara Stone saying that she was sorry to have missed the meeting, but her boss in the information resources management department (part of the IT division) had told her that he was pulling her off the project.

About an hour later, Mike Johnson called John into his office to tell him that he was putting the order processing automation project on hold. He said, "Sam went to the CEO and complained that you and I are a couple of cowboys, and were running around doing things we had no business doing." Mike seemed resigned, and continued, "Sorry John. You win some and lose some. Next time we'll do better right?"

John mumbled assent then went back to his own office. Closing the door he sat at his desk and stared out of the window. What had he done wrong, and why had someone told the company CEO that he was some kind of amateur. As the implications of this last week settled in, John wondered about his future with BizNex Inc.

## So what went wrong?

The story above is not an isolated incident. Every day, scientists, engineers, salespeople, technicians, and countless others are thrust into the role of project manager. They're very good at what they do. In fact, they're typically the most technically knowledgeable engineers or the most successful salespeople. Now they're about to become project managers.

Actually it's probably appropriate to refer to them by their more popular name: *accidental project managers*. An accidental project manager is a person who is placed into the role by organizational necessity and chance, rather than by design or through choice of career path.

If you're an accidental project manager, one of the first things you should do is pause to consider whether or not you're cut out to be a project manager and try to determine whether it's what you really want to do. Why? Because if you do a reasonably good job leading your first project, chances are you'll be asked again. And again. And again. In other words, if you're finding yourself in the same position as John, you might be embarking upon a new career. You'd be wise to consider some of the pros and cons before saying yes to that career move.

The information, tools, and techniques described in this course will move you well along in understanding the mechanics of managing projects. But it's important that you enter this new world with your eyes wide open. With that thought in mind, let's take a closer look at what you might expect to experience as a project manager.

However John may feel about taking on his first project, the truth is that life as a project manager can be extremely rewarding. You'll find it to be different from almost any other thing you've ever done. It's complex, varied, and interesting. If done well, it can lead to a very strong sense of accomplishment. These are among the aspects that project managers identify as the main draws to the job.

At the same time, being a project manager will test you in ways you may not be able to imagine. You will become a focal point in the organization especially on high profile projects. Everyone will look to you for the answers, but you must be careful not to try to provide all the answers; after all, that's why you have a team.

Speaking of the *team*, one of the biggest shifts in behavior (and thinking) you'll encounter will be the need to rely upon others to get things done. In most cases, that's your team. You'll quickly discover that there's far too much for you to do alone, yet delegation will prove to be a challenge for you. Empowering others, and then trusting them to follow through, may be a bit unsettling. You'll find yourself uncomfortable with

the idea that others are doing things for which you will be held responsible. You'll have lots of responsibility, but you'll be missing the authority often perceived as being required to discharge that responsibility.

John was given the responsibility for getting the job done but had very little authority to see to it that his decisions were implemented. This was reflected in his problems in recruiting project team members and evidenced in the fact that he could exercise only marginal control over Doug Black, the procurement specialist *and* the only other full time member. Project professionals typically have little authority to carry out their work. They have little or no direct control over those people and things that make the difference between project success and failure. Among your most valued tools will be the ability to persuade and influence, as you seek to form a group of diverse personalities into a unified team with commonality of purpose.

Unfortunately, not everyone on your team will be as knowledgeable and skilled as you would like. Nonetheless, you've got to get the job done using whatever resources have been provided. Project manager's staff is generally on temporary loan to them. This is also true of the material resources needed for the success of the project. People with specialized skills often work on the individual pieces.

On the B2B sub-project in this story, the team was structured in such a way that most of the members would bring their own specialized skills to the project, e.g., knowledge of e-commerce, knowledge of the workings of the procurement division, internet/technical skills. Often, though, skills are so specialized that they are employed only briefly. It is not at all uncommon to have the composition of the project team continually changing as the project progresses through its life cycle.

So as long as project professionals are dealing with borrowed resources, they have limited control over them. This reality overwhelmed John. The case study is full of instances in which he was incapable of getting people to do what he needs to have done.

- He couldn't get a business analyst assigned full time to his project.
- His full time resource, Doug, made it clear that he is just treading water until his retirement and doesn't even show up for the kick off meeting.
- Jerry finds a competent colleague in Sara Stone, the internet expert; but due to the political dynamics of the situation, she is pulled off the project by her boss.
- BizNex Inc. doesn't have an e-commerce expert so he will have to hire an outside consultant over whom he may not be able to exercise some degree of control.

From John's perspective, the problem is that although he is the project manager, he is not the boss. This would be highly impractical, to be boss, John would have to possess control over the career development of all the people on working on the project, and in view of the nature of his small project, highly impractical.

Project management lore is full of tales of project managers who were able to take *the hand that was dealt* and turn it into project success. For you to succeed, you'll have to rely on your ability to coach, mentor, and motivate, in order to get the level of performance you need from those assigned to work on your project.

What will you have to know as a project manager? Well, you'll have to know a little bit about just about everything. You'll have to learn to pay attention to the details, but not get wrapped up in them. You'll have to make countless decisions with insufficient information and despite conflicting signals. You'll have to condition yourself to seek *acceptable* solutions, rather than *perfect* ones. You'll have to blend technical expertise with a keen sense of human nature. You'll have to handle administrative matters.

While you're busy doing your own thing, you'll have to cultivate and maintain a smooth working relationship with many other people, both inside and outside your organization. Unfortunately, as you seek to carry out the objectives of the project, it's unlikely that everyone you encounter will be an ally. Organizational politics and reality dictate that not everyone will like project management or project managers (that's you!). Many people will admire your role, respect your position, and appreciate your involvement; others will not. You will need to figure out who's who, really fast.

One final word on John's unfortunate adventure; a substantial share of his problems are rooted by his lack of experience. For example, he does nothing to strengthen his authority. Rather than go out on his own in dealing with people in other departments at BizNex Inc., he should have worked through his vice president, Mike Johnson. He could have drafted an e-mail, sent by Mr. Johnson that explained the purpose of his inquiries. In this way, he would not have looked like a loose cannon. Because John dealt directly with

vice presidents in the company, it isn't really surprising that the information technology vice president saw John's actions as an infringement on his territory.

Project management is both an art and a science. The art is strongly tied to the interpersonal aspects; the business of leading people. The science includes understanding of processes, tools and techniques. All project managers are expected to be very well versed in the science of project management. You cannot survive without being knowledgeable in this area.

We will be addressing the overall project context, encompassing people, teams and the organization. We'll look at how organizational issues can lead to project success or failures and the central importance of politics in projects. We'll talk about strategies on how to cope with these and other realities. We'll talk about project planning and control and defining the needs and requirements analysis, we'll review some standard tools used for enhancing planning and control and finally how to successfully close out a project.

Although we'll focus primarily upon the process, we'll never lose sight of the importance of the interpersonal aspects as well as the environmental aspects; the people and things that surround your project.

## Bibliography

- J. Davidson Frame, *Managing Projects in Organization*, John Wiley, New York (1995).
- G. Heerkens, *Project Management*, McGraw-Hill, New York (2001).





# History of Project Management<sup>2</sup>

Could the Great Wall of China, the pyramids, or Stonehenge (Figure 1) have been built without project management? It is possible to say that the concept of project management has been around since the beginning of history. It has enabled leaders to plan bold and massive projects and manage funding, materials and labor within a designated time frame.



**Figure 1:** Stonehenge was erected between 3,000 BC and 1,600 BC by no less than three different cultures and its orientation on the rising and setting sun has always been one of its remarkable features.

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In late 19<sup>th</sup> century, in the United States, large-scale government projects were the impetus for making important decisions that became the basis for project management methodology such as the transcontinental railroad, which began construction in the 1860s. Suddenly, business leaders found themselves faced with the daunting task of organizing the manual labor of thousands of workers and the processing and assembly of unprecedented quantities of raw material.

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<sup>2</sup>This content is available online at <<http://cnx.org/content/m31428/1.2/>>.



**Figure 2:** This is what can happen without effective project management.

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Near the turn of the century, Frederick Taylor (Figure 3) began his detailed studies of work. He applied scientific reasoning to work by showing that labor can be analyzed and improved by focusing on its elementary parts that introduced the concept of working more efficiently, rather than working harder and longer.



**Figure 3:** Frederick Taylor (1856-1915).

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Taylor's associate, Henry Gantt (Figure 4), studied in great detail the order of operations in work and is most famous for developing the Gantt Chart in the 1910s. A Gantt chart is a popular type of bar chart that illustrates a project schedule and have become a common technique for representing the phases and activities of a project work breakdown structure, so they can be understood by a wide audience (Figure 5). Although now considered a common charting technique, Gantt charts were considered quite revolutionary at the time they were introduced. Gantt charts were employed on major infrastructure projects including the Hoover Dam and the Interstate highway system and are still accepted today as an important tool in project.



Figure 4: Henry Gantt (1861 - 1919).

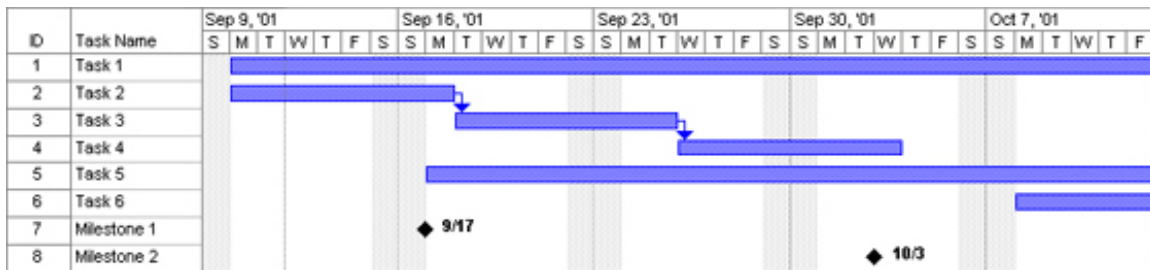


Figure 5: An example of a Gantt chart showing the relationship between a series of tasks.

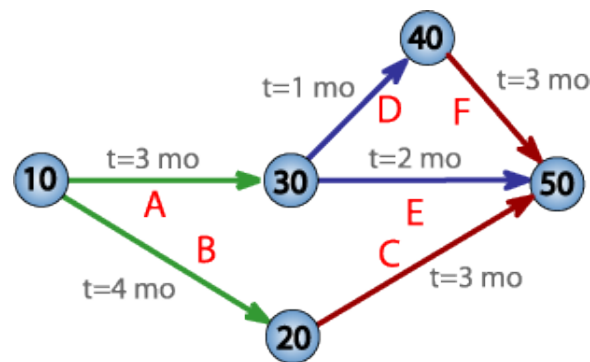
By the mid Twentieth century, projects were managed on an *ad hoc* basis using mostly Gantt Charts, and informal techniques and tools. During that time, the Manhattan project was initiated and its complexity was only possible because of project management methods. The Manhattan project was the codename given to the Allied effort to develop the first nuclear weapons during World War II. It involved over thirty different project sites in the US and Canada, and thousands of personnel from US, Canada and UK. Born out of a small research program that began in 1939, the Manhattan Project would eventually employ 130,000 people and cost a total of nearly 2 billion USD and result in the creation of multiple production and research sites operated in secret. The project succeeded in developing and detonating three nuclear weapons in 1945.

The 1950s marked the beginning of the modern Project Management era. Two mathematical project-scheduling models were developed:

1. The *Program Evaluation and Review Technique* or PERT, developed by Booz-Allen & Hamilton as part of the United States Navy's (in conjunction with the Lockheed Corporation) Polaris missile submarine program. Pert is basically a method for analyzing the tasks involved for completing a given project,

especially the time needed to complete each task, and identifying the minimum time needed to complete the total project (Figure 6).

2. The *Critical Path Method* (CPM) developed in a joint venture by both DuPont Corporation and Remington Rand Corporation for managing plant maintenance projects. The critical path determines the float, or schedule flexibility, for each activity by calculating the earliest start date, earliest finish date, latest start date, and latest finish date for each activity. The critical path is generally the longest full path on the project. Any activity with a float time that equals zero is considered a critical path task. CPM can help you figure out how long your complex project will take to complete and which activities are critical; meaning they have to be done on time or else the whole project will take longer. These mathematical techniques quickly spread into many private enterprises.



**Figure 6:** An example of a PERT network chart for a seven-month project with five milestones.

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Project management in its present form began to take root a few decades ago. In the early 1960s, industrial and business organizations began to understand the benefits of organizing work around projects. They understood the critical need to communicate and integrate work across multiple departments and professions.

The Project Management Institute (PMI) was founded in 1969 by five volunteers. Their initial goal was to establish an organization where members could share their experiences in project management and to discuss issues. Today, PMI is a non-profit project management professional association and the most widely recognized organization in terms of promoting project management best practices. PMI was formed to serve the interests of the project management industry. The premise of PMI is that the tools and techniques of project management are common even among the widespread application of projects from the software to the construction industry. PMI first began offering the PMP certification exam in 1984. Although it took a while for people to take notice, now more than 260,000 individuals around the world hold the PMP designation.

To help keep project management terms and concepts clear and consistent, PMI introduced the Project Management Body of Knowledge (PMBOK) Guide in 1987. They updated it in 1996, 2000, 2004, and most recently in 2009 as the fourth edition. At present, there are more than 1 million copies of the PMBOK Guide in circulation. The highly regarded Institute of Electrical and Electronics Engineers (IEEE) have adopted it as their project management standard.

In 1999 PMI was accredited as an American National Standards Institute (ANSI) standards developer and also has the distinction of being the first organization to have its certification program attain International Organization for Standardization (ISO) 9001 recognition. In 2008, the organization reported more than 260,000 members in over 171 countries. PMI also has offices in Washington, D.C., and Beijing, China, as

well as Regional Service Centers in Singapore, Brussels (Belgium) and New Delhi (India). Recently, an office was opened in Mumbai (India).

# What is a Project?<sup>3</sup>

The starting point in discussing how projects should be properly managed is to first understand *what a project is* and just as importantly *what it is not*.

People have been undertaking projects since the earliest days of organized human activity. The hunting parties of our prehistoric ancestors were projects for example; they were temporary undertakings directed at the goal of obtaining meat for the community. Large complex projects have also been with us for a long time. The pyramids and the Great Wall of China, were in their day of roughly the same dimensions as the Apollo Project to send man to the moon. We use the term project frequently in our daily conversations. A husband, for example may tell his wife, “My main project for this weekend is to straighten out the garage.” Going hunting, building pyramids, and fixing faucets all share certain features that make them projects.

A project has distinctive attributes, which distinguish it from ongoing work or business operations. Projects are temporary in nature. They are not an everyday business process and have definitive start dates and end dates. This characteristic is important because a large part of the project effort is dedicated to ensuring that the project is completed at the appointed time. To do this, schedules are created showing when tasks should begin and end. Projects can last minutes, hours, days, weeks, months or years.

Projects exist to bring about a product or service that hasn’t existed before. In this sense, a project is unique. Unique means that this is new, this has never been done before. Maybe it’s been done in a very similar fashion before but never exactly in this way. For example, Ford Motor Company is in the business of designing and assembling cars. Each model that Ford designs and produces can be considered a project. The models differ from each other in their features and are marketed to people with various needs. An SUV serves a different purpose and clientele than a luxury model. The design and marketing of these two models are unique projects. However the actual assembly of the cars is considered an operation, i.e., a repetitive process that is followed for most makes and models.

In contrast with projects, operations are ongoing and repetitive. They involve work that is continuous without an ending date and you often repeat the same processes and produce the same results. The purpose of operations is to keep the organization functioning while the purpose of a project is to meet its goals and to conclude. Therefore, operations are ongoing while projects are unique and temporary.

The project is completed when its goals and objectives are accomplished. It is these goals that drive the project and all the planning and implementation efforts are undertaken to achieve them. Sometimes projects end when it’s determined that the goals and objectives cannot be accomplished or when the product or service of the project is no longer needed and the project is cancelled.

## A formal definition of a project

There are many written definitions of a project, however, all of them contain the key elements described above. For those looking for a formal definition of a project the Project Management Body of Knowledge (PMBOK) defines a project as *a temporary endeavor undertaken to create a unique product, service or result. The temporary nature of projects indicates a definite beginning and end. The end is reached when*

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<sup>3</sup>This content is available online at <<http://cnx.org/content/m31435/1.2/>>.

*the project's objectives have been achieved or when the project is terminated because its objectives will not or cannot be met, or when the need for the project no longer exists.*

## **Bibliography**

- J. Davidson Frame, *Managing Projects in Organizations*, Wiley, New York (1995).



# Project Characteristics<sup>4</sup>

When considering whether or not you have a project on your hands, there are some things to keep in mind. First, is it a project or ongoing operation? Next, if it is a project; who are the stakeholders? And third, what characteristics distinguish this endeavor as a project?

A project has several characteristics:

- Projects are unique.
- Projects are temporary in nature and have a definite beginning and ending date.
- Projects are completed when the project goals are achieved or it's determined the project is no longer viable.
- A successful project is one that meets or exceeds the expectations of your stakeholders.

Consider the following scenario: The VP of marketing approaches you with a fabulous idea. (Obviously it must be “fabulous” because he thought of it.) He wants to set up kiosks in local grocery stores as mini offices. These offices will offer customers the ability to sign up for car and home insurance services as well as make their bill payments. He believes that the exposure in grocery stores will increase awareness of the company's offerings. He told you that senior management has already cleared the project and he'll dedicate as many resources to this as he can. He wants the new kiosks in place in 12 selected stores in a major city by the end of the year. Finally, he has assigned you to head up this project.

Your first question should be “Is it a project?” This may seem elementary, but confusing projects with ongoing operations happens often. Projects are temporary in nature, have definite start and end dates, result in the creation of a unique product or service, and are completed when their goals and objectives have been met and signed off by the stakeholders.

Using these criteria, let's examine the assignment from the VP of marketing to determine if it is a project:

**Is it unique?** Yes, because the kiosks don't exist in the local grocery stores. This is a new way of offering the company's services to its customer base. While the service the company is offering isn't new, the way it is presenting its services is.

**Does the product have a limited timeframe?** Yes, the start date of this project is today, and the end date is the end of next year. It is a temporary endeavor.

**Is there a way to determine when the project is completed?** Yes, the kiosks will be installed and the services will be offered from them. Once all the kiosks are intact and operating, the project will come to a close.

**Is there a way to determine stakeholder satisfaction?** Yes, the expectations of the stakeholders will be documented in the form of requirements during the planning processes. These requirements will be compared to the finished product to determine if it meets the expectations of the stakeholder.

If the answer is yes to all these questions, then “Houston, we have a project”.

## Bibliography

- K. Heldman, C. Baca, and P. Jansen, *Project Manager Professional Study Guide*, Wiley Publishing, Inc. New jersey (1995).

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<sup>4</sup>This content is available online at <<http://cnx.org/content/m31437/1.1/>>.



# Project Stakeholders<sup>5</sup>

A project is successful when it achieves its objectives and meets or exceeds the expectations of the stakeholders. But who are the stakeholders? Stakeholders are individuals who either care about or have a vested interest in your project. They are the people who are actively involved with the work of the project or have something to either gain or lose as a result of the project. When you manage a project to add lanes to a highway, motorists are stakeholders who are positively affected. However, you negatively affect residents who live near the highway during your project (with construction noise) and after your project with far reaching implications (increased traffic noise and pollution).

NOTE: Key stakeholders can make or break the success of a project. Even if all the deliverables are met and the objectives are satisfied, if your key stakeholders aren't happy, nobody's happy.

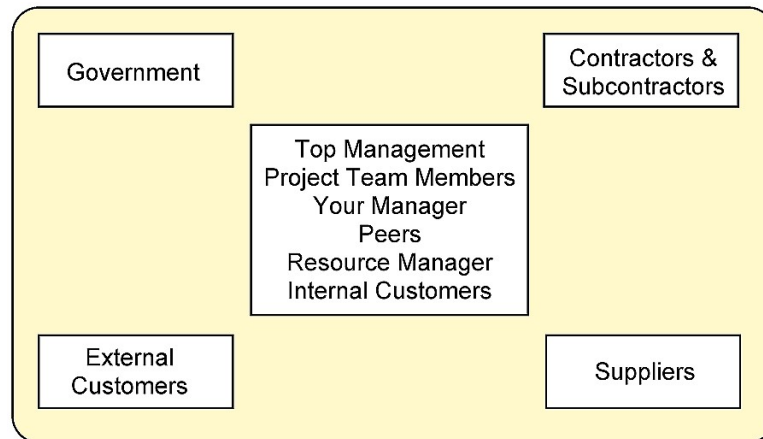
The project sponsor, generally an executive in the organization with the authority to assign resources and enforce decisions regarding the project, is a stakeholder. The customer, subcontractors, suppliers and sometimes even the Government are stakeholders. The project manager, project team members and the managers from other departments in the organization are stakeholders as well. It's important to identify all the stakeholders in your project upfront. If you leave out an important stakeholder or their department's function and don't discover the error until well into the project, it could be a project killer.

Figure 1 shows a sample of the project environment featuring the different kinds of stakeholders involved on a typical project. A study of this diagram confronts us with a couple of interesting facts.

- First, the number of stakeholders that project managers must deal with assures that they will have a complex job guiding their project through the lifecycle. Problems with any of these members can derail the project.
- The diagram also shows that project managers have to deal with people external to the organization as well as the internal environment, certainly more complex than what a manager in an internal environment faces. For example, suppliers who are late in delivering crucial parts may blow the project schedule. To compound the problem, project managers generally have little or no direct control over any of these individuals.

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<sup>5</sup>This content is available online at <<http://cnx.org/content/m31209/1.2/>>.



**Figure 1:** Project stakeholders.

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Let's take a look at these stakeholders and their relationships to the project manager.

## Top management

Top management may include the president of the company, vice presidents, directors, division managers, the corporate operating committee, and others. These people direct the strategy and development of the organization.

On the plus side, you more likely to have top management support, which means it will be easier to recruit the best staff to carry out the project, and to acquire needed material and resources; also visibility can enhance PM's professional standing in the company.

On the minus side, failure can be quite dramatic and visible to all, and if the project is large and expensive (most are) the cost of failure will be more substantial than for a smaller less visible project.

Some suggestions in dealing with top management are:

- Develop in-depth plans and major milestones that must be approved by top management during the design phase of the project.
- Ask top management associated with your project for their information reporting needs and frequency.
- Develop a status reporting methodology to be distributed on a scheduled basis.
- Keep them informed of project risks and potential impacts at all times.

## The project team

Your project team available to project managers on their project or borrowed rather than assigned to the project on a full time basis. As project manager you need to provide leadership, direction and above all, the support to team members as they go about accomplishing their tasks. Working closely with the team to solve problems can help you learn from the team and build rapport. Showing your support for the project team and for each member will help you get their support and cooperation.

Some difficulties in dealing with project team members include:

- Since project team members are borrowed and they don't report to you, their priorities may be elsewhere.
- They may be juggling many projects as well as their full time job and have difficulty meeting any deadline.
- Personality conflicts may arise. These may be caused by differences in social style or values or they may be the result of some bad experience when people worked together in the past.
- You may find out about missed deadlines when it is too late to recover.

Managing project team members requires interpersonal skills. Here are some suggestions that can help:

- Involve team members in project planning.
- Arrange to meet privately and informally with each team member at several points in the project, perhaps for lunch or coffee.
- Be available to hear team members' concerns at any time.
- Encourage team members to pitch in and help others when needed.
- Complete a project performance review for team members.

## Your manager

Typically the boss decides what our assignment is and who can work with us on our projects. Keeping your manager informed will help ensure that you get the necessary resources to complete your project.

- If things go wrong on a project, it is nice to have an understanding and supportive boss to go to bat for us if necessary. By supporting your manager, you will find your manager will support you more often.
- Find out exactly how your performance will be measured.
- When unclear about directions, ask for clarification.
- Develop a reporting schedule that is acceptable to your boss.
- Communicate frequently.

## Peers

Peers are people on the project team who are at the same level in the organization as you. These people will, in fact, also have a vested interest in the product. However, they will have neither the leadership responsibilities nor the accountability for the success or failure of the project that you have.

Your relationship with peers can be impeded by:

- Inadequate control over peers.
- Political maneuvering or sabotage.
- Personality conflict or technical conflict.
- Envy because your peer may have wanted to lead the project.
- Conflicting instructions from your manager and your peer's manager.

Peer support is essential. Because most of us serve our self-interest first, use some investigating, selling, influencing and politicking skills here. To ensure you have cooperation and support from your peers:

- Get the support of your project sponsor or top management to empower you as the project manager with as much authority as possible. It's important that the sponsor makes it clear to the other team members that their cooperation on project activities is expected.
- Confront your peer if you notice a behavior that seems dysfunctional, such as bad-mouthing the project.
- Be explicit in asking for full support from your peers.
- Arrange for frequent review meetings.
- Establish goals and standards of performance for all team members.

## Resource managers

Because project managers are in the position of borrowing resources, other managers control their resources. So their relationships with people are especially important. If their relationship is good, they may be able to consistently acquire the best staff and the best equipment for their projects. If relations aren't so good, they may find themselves not able to get good people or equipment needed on the project.

## Internal customer

Internal customers are individuals within the organization who have projects that meet the needs of internal demands. The customer holds the power to accept or reject your work. Early in the relationship, the project manager will need to negotiate, clarify, and document project specifications and deliverables. After the project begins, the project manager must stay tuned in to the customer's concerns and issues and keep the customer informed.

Common stumbling blocks when dealing with customers include:

- A lack of clarity about precisely what is wanted by the customer.
- A lack of documentation for what is wanted.
- A lack of knowledge of the customer's organization and operating characteristics.
- Unrealistic deadlines, budgets, or specifications.
- Hesitancy to sign off on the project or accept responsibility for decisions.
- Changes in project scope.

To meet the needs of the customer, client or owner, be sure to do the following:

- Learn the client's organization's buzzwords, culture, and business.
- Clarify all project requirements and specifications in a written agreement.
- Specify a change procedure.
- Establish the project manager as the focal point of communications in the project organization.

## External customer

External customers are the customers when projects could be marketed to outside customers. In the case of Ford Motor Company for example, the external customers would be the buyers of the automobiles.

## Government

Project managers working in certain heavily regulated environment (e.g., pharmaceutical, banking industries, etc.) will have to deal with government regulators and departments. These can include all or some levels from city, through county, state, and federal, to international.

## Contractors, subcontractors, and suppliers

There are times when organizations don't have the expertise in house or available resources and work is farmed out to contractors or subcontractors. This can be a construction management firm, network consultants, electricians, carpenters, architects, and in general anyone who is not an employee. Managing contractors or suppliers requires many of the skills needed to manage full-time project team members.

Any number of problems can arise with contractors or subcontractors:

- Quality of the work.

- Cost overruns.
- Schedule slippage.

Many projects heavily depend on goods provided by outside suppliers. This is true for example of construction projects where lumber, nails, brick and mortar come from outside suppliers.

- If the supplied goods are delivered late or in short supply or of poor quality or if the price is greater than originally quoted, the project may suffer.

Depending on the project, managing relationships can consume more than half of the project manager's time. It is not purely intuitive; it involves a sophisticated skill set that includes managing conflicts, negotiating, and other interpersonal skills.





# The Politics of Projects<sup>6</sup>

Many times, project stakeholders have conflicting interests. It's the project manager's responsibility to understand these conflicts and try to resolve them. It's also the project manager's responsibility to manage stakeholder expectations. Be certain to identify and meet with all key stakeholders early in the project to understand all their needs and constraints.

Project managers are somewhat like politicians. Typically, they are not inherently powerful, or capable of imposing their will directly to co-workers, subcontractors and suppliers. Like politicians, if they are to get their way, they have to exercise influence effectively over others. On projects, project managers have direct control over very few things; therefore their ability to influence others- to be a good politician- may be very important

Here are a few steps a good project politician should follow. However, a good rule is that when in doubt, stakeholder conflicts should always be resolved in favor of the customer.

## Assess the environment

Identify all the relevant stakeholders. Because each of these stakeholders could derail the project we need to consider their particular interest in the project.

- Once all relevant stakeholders are identified, we try to determine where the power lies.
- In the vast cast of characters we confront, who counts most?
- Whose actions will have the greatest impact?

## Identify goals

After determining whom the stakeholders are, we should identify their goals.

- What is it that drives them?
- What is each after?
- We should also be aware of hidden agendas of goals that are not openly articulated.
- We need to pay special attention to the goals of the stakeholders who hold the power.

## Define the problem

- The facts that constitute the problem should be isolated and closely examined.
- The question should be raised "What is the real situation?" over and over.

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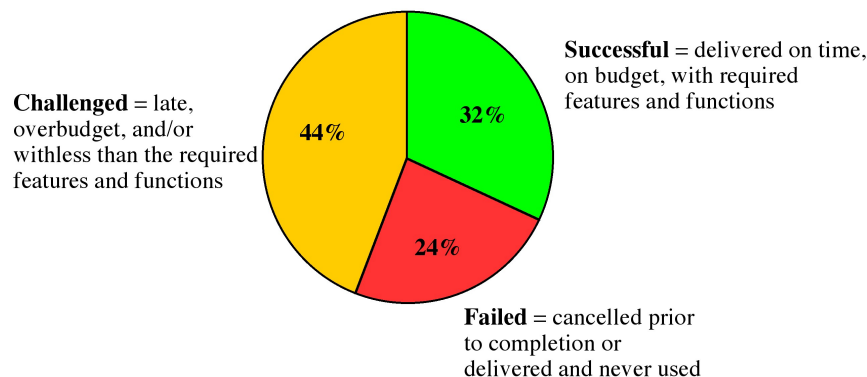
<sup>6</sup>This content is available online at <<http://cnx.org/content/m31439/1.2/>>.



# What is Project Management?<sup>7</sup>

You've determined that you have a project. What now? The notes you scribbled down on the back of the napkin at lunch are a start, but not exactly good project management practice. Too often, organizations follow Nike's advice when it comes to managing projects when they "just do it." An assignment is made and the project team members jump directly into the development of the product or service requested. In the end the delivered product doesn't meet the expectations of the customer. Unfortunately, many projects follow this poorly constructed path and that is a primary contributor to why a large percentage of projects don't meet their original objectives defined by performance, schedule, and budget.

In the United States, more than \$250 billion dollars is spent each year on IT application development in approximately 175,000 projects. The Standish Group (a Boston-based leader in project and value performance research) just released the summary version of their 2009 CHAOS Report that tracks project failure rates across a broad range of companies and industries (Figure 1).



**Figure 1:** Summary of 2009 Standish Group CHAOS report.

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Jim Johnson, chairman of the Standish Group has stated that "this year's results show a marked decrease in project success rates, with 32% of all projects succeeding which are delivered on time, on budget, with required features and functions, 44% were challenged which are late, over budget, and/or with less than the required features and functions and 24% failed which are cancelled prior to completion or delivered and never used."

When are companies going to stop wasting billions of dollars on failed projects? The vast majority of this waste is completely avoidable; simply get the right business needs (requirements) understood early in the

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<sup>7</sup>This content is available online at <<http://cnx.org/content/m31508/1.4/>>.

process and ensure that project management techniques are applied and followed and the project activities are monitored.

Applying good project management discipline is the way to help reduce the risks. But keep in mind, having good project management skills does not mean you have no problems, it does not mean that risks go away, or that there won't be any surprises. The value of good project management is that you have standard processes in place to deal with all contingencies.

Project Management is the application of knowledge, skills, tools, and techniques applied to project activities in order to meet the project requirements. Project management is a process that includes planning, putting the project plan into action, and measuring progress and performance.

Managing a project includes identifying your project's requirements; writing down what everyone needs from the project. What are the objectives for your project? When everyone understands the goal, it's much easier to keep them all on the right path. Make sure you set goals that everyone agrees on to avoid team conflicts later on. Understanding and addressing the needs of everyone affected by the project means the end result of your project is far more likely to satisfy your stakeholders, and last but not least, as project manager you will also be balancing the many competing project constraints.

On any project, you will have a number of competing project constraints that are competing for your attention. They are cost, scope, quality, risk, resources and time.

- **Cost** is budget approved for the project including all necessary expenses needed to deliver the project. Within organizations, project managers have to balance between not running out of money and not under spending because many projects receive funds or grants that have contract clauses with an "use it or lose it" approach to project funds. Poorly executed budget plans can result in a last minute rush to spend the allocated funds. For virtually all projects, cost is ultimately a limiting constraint; few projects can go over budget without eventually requiring a corrective action.
- **Scope** is what the project is trying to achieve, it entails all the work involved in delivering the projects outcomes and the processes used to produce them. It is the reason and the purpose of the project.
- **Quality** is the standards and criteria to which the project's products must be delivered for them to perform effectively. First, the product must perform to provide the functionality expected, and to solve the problem, and deliver the benefit and value expected of it. It must also meet other performance requirements, or service levels, such as availability, reliability and maintainability, and have acceptable finish and polish. Quality on a project is controlled through quality assurance (QA) that is the process of evaluating overall project's performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.
- **Risk** is defined by potential external events that will have a negative impact on your project if they occur. Risk refers to the combination of the probability the event will occur and the impact on the project if the event occurs. If the combination of the probability of the occurrence and the impact to the project is too high, you should identify the potential event as a risk and put a proactive plan in place to manage the risk.
- **Resources** are required to carry out the project tasks. They can be people, equipment, facilities, funding, or anything else capable of definition (usually other than labor) required for the completion of a project activity.
- **Time** is defined as the time to complete the project. Time is often the most frequent project oversight in developing projects. This is reflected in missed deadlines and incomplete deliverables. Proper control of the schedule requires the careful identification of tasks to be performed, an accurate estimation of their durations, the sequence in which they are going to be done, and how people and other resources are allocated.

You may have heard of the term "Triple Constraint" which traditionally only consisted of *Time, Cost & Scope*. These are the primary competing project constraints that you have to be aware of most. The triple constraint is illustrated in the form of a triangle to visualize the project work and to see the relationship between the scope/quality, schedule/time, and cost/resource (Figure 2).



**Figure 2:** A schematic of the triple constraint triangle.

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In this triangle, each side represents one of the constraints (or related constraints) wherein any changes to any one side cause a change in the other sides. The best projects have a perfectly balanced triangle. Maintaining this balance is difficult because projects are prone to change. For example, if scope increases, cost and time may increase disproportionately. Alternatively, if the amount of money you have for your project decreases, you may be able to do as much, but your time may increase.

Your project may have additional constraints that you are facing, and as the project manager you have to balance the needs of these constraints against the needs of the stakeholders and against your project goals. For instance, if your sponsor wants to add functionality to the original scope you will very likely need more money to finish the project or if they cut the budget you have to reduce the quality of your scope and if you don't get the appropriate resources to work on your project tasks you will have to extend your schedule because the resources you have take much longer to finish the work.

You get the idea; they are all dependent on each other. Think of all of these constraints as the classic carnival game of Whac-a-mole (Figure 3). Each time you try to push one mole back in the hole, another one pops out. The best advice is to rely on your project team to keep these moles in place!



**Figure 3:** Go to [www.dorneypark.com/public/online\\_fun/mole.cfm](http://www.dorneypark.com/public/online_fun/mole.cfm) to play Whac-a-mole.

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Here is an example of a project that cut *quality* because the project *costs* were fixed. The P-36 oil platform (Figure 4) was the largest floating production platform in the world capable of processing 180,000 barrels of oil per day and 7.2 million cubic meters of gas per day. Located in the Roncador Field, Campos Basin, Brazil the P-36 was operated by Petrobras.



**Figure 4:** The Petrobras P-36 oil platform.

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In March 2001, the P-36 was producing around 84,000 barrels of oil and 1.3 million cubic meters of gas per day when it became destabilized by two explosions and subsequently sank in 3900 feet of water with 1650 short tons of crude oil remaining on board, killing 11 people.

The sinking is attributed to a complete failure in quality assurance and pressure for increased production led to corners being cut on safety procedures. It is listed as one of the most expensive accidents with a price

tag of \$515,000,000.

The following quote is from a Petrobras executive, citing the benefits of cutting quality assurance and inspection costs on the project, while the accompanying pictures are the result of this proud achievement in project management by Petrobras.



**Figure 5:** "Petrobras has established new global benchmarks for the generation of exceptional shareholder wealth through an aggressive and innovative program of cost cutting on its P36 production facility."



**Figure 6:** "Conventional constraints have been successfully challenged and replaced with new paradigms appropriate to the globalized corporate market place."

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**Figure 7:** "Through an integrated network of facilitated workshops, the project successfully rejected the established constricting and negative influences of prescriptive engineering, onerous quality requirements, and outdated concepts of inspection and client control."

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**Figure 8:** "Elimination of these unnecessary straitjackets has empowered the project's suppliers and contractors to propose highly economical solutions, with the win-win bonus of enhanced profitability margins for themselves."

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**Figure 9:** "The P36 platform shows the shape of things to come in the unregulated global market economy of the 21<sup>st</sup> century."

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The dynamic trade-offs between the project constraint values has been humorously but accurately described in Figure 10.

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**"We can do GOOD, QUICK and CHEAP work.**  
You can have any two but not all three.  
1. GOOD QUICK work won't be CHEAP.  
2. GOOD CHEAP work won't be QUICK.  
3. QUICK CHEAP work won't be GOOD."

**Figure 10:** A sign seen at an automotive repair shop.

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## Bibliography

- *CHAOS 2009 Summary and EPPM Study*, The Standish Group, Boston, MA (2009).



# Project Management Areas of Expertise<sup>8</sup>

In order for you as the project manager to manage the competing project constraints and to manage the project as a whole, there are some areas of expertise that you should bring onto the project team (Figure 1). They are the application area of knowledge; standards and regulations in your industry, understanding the project environment, and you must have general management knowledge and interpersonal skills. It should be noted that the industry expertise is not in a certain field but the expertise in order to run the project. So while knowledge of the type of industry is important you will have a project team supporting you in this endeavor. For example, if you are managing a project that is building an oil platform, you would not be expected to have a detailed understanding of the engineering since your team will have mechanical and civil engineers who will provide the appropriate expertise, however, it would definitely help if you understand this type of work.

Let's take a look at each of these areas in more detail.

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Areas of Expertise
Application knowledge, standards & regulations
Understanding the project environment
Management knowledge & skills
Interpersonal skills

**Figure 1:** Areas of expertise that a project manager should bring to the project team.

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## Application knowledge; standards & regulations

By *standards*, we mean guidelines or preferred approaches that are not necessarily mandatory. In contrast, when referring to *regulations* we mean mandatory rules that must be followed such as Government imposed requirements through laws. It should go without saying that as a professional, you're required to follow all applicable laws and rules that apply to your industry, organization, or project. Every industry has standards and regulations. Knowing which ones effect your project before you begin work will not only help the project to unfold smoothly, but will also allow for effective risk analysis.

Some projects require specific skills in certain application areas. Application areas are made up of categories of projects that have common elements. They can be defined by: industry group (pharmaceutical,

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<sup>8</sup>This content is available online at <<http://cnx.org/content/m31888/1.2/>>.

financial, etc), by department (accounting, marketing, legal, etc), by technical (software development, engineering, etc), or management (procurement, research, & development, etc) specialties. These application areas are usually concerned with disciplines, regulations and the specific needs of the project, the customer, or the industry. For example, most government agencies have specific procurement rules that apply to their projects that wouldn't be applicable in the construction industry. The pharmaceutical industry is interested in regulations set forth by the Food and Drug Administration, whereas the automotive industry has little or no concern for either of these types of regulations. You need to stay up-to-date regarding your industry so that you can apply your knowledge effectively. Today's fast paced advances can leave you behind fairly quickly if you don't stay abreast on current trends.

Having some level of experience in the application area you're working in will give you an advantage when it comes to project management. While you can call in experts who have the application area knowledge, it doesn't hurt for you to understand the specific aspects of the application areas of your project.

## Understanding the project environment

There are many factors that need to be understood within your project environment (Figure 2). At one level you need to understand your project environment by thinking in terms of the cultural and the social environment. In this region we think of people, demographics and education. The international and political environment is where you need to understand about different countries cultural influences. Then we move on to the physical environment; here we think about time zones, think about different countries and how differently your project will be executed whether it is just in your country or whether you have an international project team that is distributed throughout the world in five different countries.

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Project Environment	
Cultural	Social
International	Political
Physical	

**Figure 2:** The important factors to consider within the project environment.

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Of all the factors the physical ones are the easiest to understand, and it is the cultural and international factors that are often misunderstood or ignored. How we deal with clients, customers, or project members from other countries can be critical to the success of the project. For example, the culture of the United States values accomplishments and individualism. Americans tend to be informal and call each other by first names, even if having just met. Europeans tend to be more formal, using surnames instead of first names in a business setting, even if they know each other well. In addition, their communication style is more formal than in the US, and while they tend to value individualism, they also value history, hierarchy, and loyalty. The Japanese, on the other hand, tend to communicate indirectly and consider themselves part of a group, not as individuals. The Japanese value hard work and success, as most of us do.

How a product is received can be very dependent on the international cultural differences. For example, in the nineties, when many large American and European telecommunications companies were cultivating new markets in Asia, their customer's cultural differences often produced unexpected situations. Western companies planned their telephone systems to work the same way in Asia as they did in Europe and America.

But the protocol of conversation was different. Call-waiting, a popular feature in the West, is considered impolite in some parts of Asia. This cultural blunder could have been avoided had the team captured the project environment requirements and involved the customer.

It is often the simplest things that can cause trouble since unsurprisingly in different countries people do things differently. One of the most notorious examples of this is also one of the most simple: date formats. What day and month is 2/8/2009? Of course it depends where you come from; in North America it is February 8<sup>th</sup> while in Europe (and much of the rest of the world) it is 2<sup>nd</sup> August. Clearly, when schedules and deadlines are being defined it is important that everyone is clear on the format used.

The diversity of practices and cultures and its impact on products in general and on software in particular, goes well beyond the date issue. You may be managing a project to create a new website for a company that sells products worldwide. There are language and presentation style issues to take into consideration; converting the site into different languages isn't enough. It is obvious to ensure that the translation is correct, however, the presentation layer will have its own set of requirements for different cultures. The left side of a web site may be the first focus of attention for an American; the right side would be the initial focus for anyone from the Middle East, as both Arabic and Hebrew are written from right to left. Colors also have different meanings in different cultures. White, which is a sign of purity in America (e.g., a bride's wedding dress), and thus would be a favored background color in North America, signifies death in Japan (e.g., a burial shroud). Table 1 summarizes different meanings of common colors.

Color	United States	China	Japan	Egypt	France
Red	Danger, stop	Happiness	Anger, danger	Death	Aristocracy
Blue	Sadness, melancholy	Heavens, clouds	Villainy	Virtue, faith, truth	Freedom, peace
Green	Novice, apprentice	Ming dynasty, heavens	Future, youth, energy	Fertility, strength	Criminality
Yellow	Cowardice	Birth, wealth	Grace, nobility	Happiness, prosperity	Temporary
White	Purity	Death, purity	Death	Joy	Neutrality

**Table 1:** The meaning of colors in various cultures. Adapted from P. Russo and S. Boor, *How Fluent is Your Interface? Designing for International Users*, Proceedings of the INTERACT '93 and CHI '93, Association for Computing Machinery, Inc. (1993).

Project managers in multicultural projects must appreciate the culture dimensions and try to learn relevant customs, courtesies, and business protocols before taking responsibility for managing an international project. A project manager must take into consideration these various cultural influences and how they may affect the project's completion, schedule, scope and cost.

## Management knowledge & skills

As the project manager you have to rely on your project management knowledge and your general management skills. In this area we are thinking of items like your ability to plan the project, to execute the project properly and of course to control the project and bring it to a successful conclusion with the ability to guide the project team while achieving project objectives and balancing the project constraints.

There is more to project management than just getting the work done. Inherent to the process of project management are the general management skills that allow the project manager to complete the project with some level of efficiency and control. In some respects, managing a project is similar to running a business: there are risk and rewards, finance and accounting activities, human resource issues, time management,

stress management, and a purpose for the project to exist. General management skills are needed in just about every project.

## Interpersonal skills

Last but not least you also have to bring the ability onto the project to manage personal relationships as well as dealing with issues as they arise. Here were talking about your interpersonal skills as shown in Figure 3.

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Interpersonal Skills	
Communication	Influence
Leadership	Motivation
Negotiation	Problem solving

**Figure 3:** Interpersonal skills required of a project manager.

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### Communication

Project managers spend 90% of their time communicating. Therefore they must be good communicators, promoting clear unambiguous exchange of information. As a project manager, it is your job to keep a number of people well informed. It is essential that your project staff know what is expected of them: what they have to do, when they have to do it, and what budget and time constraints and quality specification they are working towards. If project staff does not know what their tasks are, or how to accomplish them, then the entire project will grind to a halt. If you do not know what the project staff is (or often is not) doing then you will be unable to monitor project progress. Finally, if you are uncertain of what the customer expects of you, then the project will not even get off the ground. Project communication can thus be summed up as *who needs what information and when*.

All projects require sound communication plans, but not all projects will have the same types of communication or the same methods for distributing the information. For example, will information be distributed via mail or e-mail, is there a shared web site, or are face-to-face meetings required? The communication management plan documents how the communication needs of the stakeholders will be met, including the types of information that will be communicated, who will communicate it, who receives the communication, the methods used to communicate, the timing and frequency, the method for updating the plan as the project progresses, escalation process, and a glossary of common terms.

### Influence

Project management is about getting things done. Every organization is different in its policies, modes of operations and underlying culture. There are political alliances, differing motivations, conflicting interest, and power struggles within every organization. A project manager must understand all of the unspoken influences at work within an organization.

## **Leadership**

Leadership is the ability to motivate and inspire individuals to work towards expected results. Leaders inspire vision and rally people around common goals. A good project manager can motivate and inspire the project team to see the vision and value of the project. The project manager as a leader can inspire the project team to find a solution to overcome the perceived obstacles to get the work done.

## **Motivation**

Motivation helps people work more efficiently and produce better results. Motivation is a constant process that the project manager must have to help the team move towards completion with passion and a profound reason to complete the work. Motivating the team is accomplished by using a variety of team building techniques and exercises. Team building is simply getting a diverse group of people to work together in the most efficient and effective manner possible. This may involve management events as well as individual actions designed to improve team performance.

Recognition and rewards are an important part of team motivations. They are formal ways of recognizing and promoting desirable behavior and are most effective when carried out by the management team and the project manager. Consider individual preferences and cultural differences when using rewards and recognition. Some people don't like to be recognized in front of a group; others thrive on it.

## **Negotiation**

Project managers must negotiate for the good of the project. In any project, the project manager, the project sponsor, and the project team will have to negotiate with stakeholders, vendors, and customers to reach a level of agreement acceptable to all parties involved in the negotiation process.

## **Problem solving**

Problem solving is the ability to understand the heart of a problem, look for a viable solution, and then make a decision to implement that solution. The premise for problem solving is problem definition. Problem definition is the ability to understand the cause and effect of the problem; this centers on root cause analysis. If a project manager treats only the symptoms of a problem rather than its cause, the symptoms will perpetuate and continue through the project life. Even worse treating a symptom may result in a greater problem. For example, increasing the ampere rating of a fuse in your car because the old one keeps blowing does not solve the problem of an electrical short that could result in a fire. Root cause analysis looks beyond the immediate symptoms to the cause of the symptoms, which then affords opportunities for solutions. Once the root of a problem has been identified, a decision must be made to effectively address the problem.

Solutions can be presented from vendors, the project team, the project manager or various stakeholders. A viable solution focuses on more than just the problem; it looks at the cause and effect of the solution itself. In addition, a timely decision is needed or the window of opportunity may pass and then a new decision will be needed to address the problem. As in most cases, the worst thing you can do is nothing.

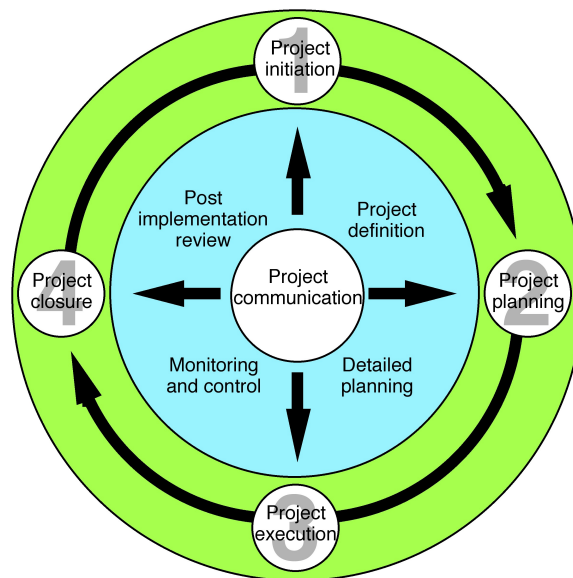
All of these interpersonal skills will be utilized in all areas of project management. Start practicing now because its guaranteed that you'll need these skills on your next project.





# The Project Life Cycle<sup>9</sup>

The project manager and project team have one shared goal: to carry out the work of the project for the purpose of meeting the project's objectives. Every project has beginnings, a middle period during which activities move the project toward completion, and an ending (either successful or unsuccessful). A standard project typically has the following four major phases (each with its own agenda of tasks and issues): *initiation*, *planning*, *execution*, and *closure*. Taken together, these phases represent the path a project takes from the beginning to its end and are generally referred to as the project *life cycle* (Figure 1).



**Figure 1:** The four phase of the project life cycle. Adapted from J. Westland, *The Project Management Lifecycle*, Kogan Page Limited (2006).

## Initiation phase

During the first of these phases, the *initiation phase*, the project objective or need is identified; this can be a business problem or opportunity. An appropriate response to the need is documented in a business case with recommended solution options. A feasibility study is conducted to investigate whether each option addresses

<sup>9</sup>This content is available online at <<http://cnx.org/content/m31913/1.5/>>.

the project objective and a final recommended solution is determined. Issues of feasibility (“can we do the project?”) and justification (“should we do the project?”) are addressed.

Once the recommended solution is approved, a project is initiated to deliver the approved solution and a project manager is appointed. The major deliverables and the participating work groups are identified and the project team begins to take shape. Approval is then sought by the project manager to move on the detailed planning phase.

## Planning phase

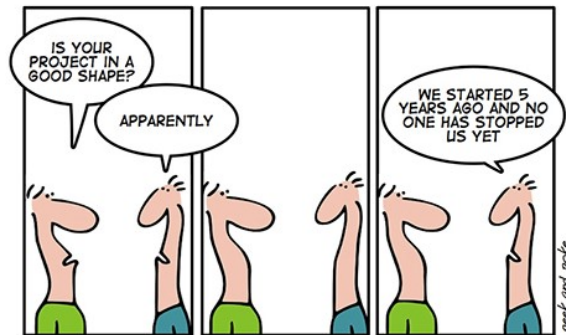
The next phase, the *planning phase*, is where the project solution is further developed in as much detail as possible and you plan the steps necessary to meet the project’s objective. In this step, the team identifies all of the work to be done. The project’s tasks and resource requirements are identified, along with the strategy for producing them. This is also referred to as scope management. A project plan is created outlining the activities, tasks, dependencies and timeframes. The project manager coordinates the preparation of a project budget; by providing cost estimates for the labor, equipment and materials costs. The budget is used to monitor and control cost expenditures during project execution.

Once the project team has identified the work, prepared the schedule and estimated the costs, the three fundamental components of the planning process are complete. This is an excellent time to identify and try to deal with anything that might pose a threat to the successful completion of the project. This is called *risk management*. In risk management, “high-threat” potential problems are identified along with the action that is to be taken on each high threat potential problem, either to reduce the probability that the problem will occur or to reduce the impact on the project if it does occur. This is also a good time to identify all project stakeholders, and to establish a communication plan describing the information needed and the delivery method to be used to keep the stakeholders informed.

Finally, you will want to document a quality plan; providing quality targets, assurance, and control measures along with an acceptance plan; listing the criteria to be met to gain customer acceptance. At this point, the project would have been planned in detail and is ready to be executed.

## Execution phase

During the third phase, the *execution phase*, the project plan is put into motion and performs the work of the project. It is important to maintain control and communicate as needed during execution. Progress is continuously monitored and appropriate adjustments are made and recorded as variances from the original plan. In any project a project manager will spend most of their time in this step. During project execution, people are carrying out the tasks and progress information is being reported through regular team meetings. The project manager uses this information to maintain control over the direction of the project by measuring the performance of the project activities comparing the results with the project plan and takes corrective action as needed. The first course of action should always be to bring the project back on course, i.e., to return it to the original plan. If that cannot happen, the team should record variations from the original plan and record and publish modifications to the plan. Throughout this step, project sponsors and other key stakeholders should be kept informed of project status according to the agreed upon frequency and format. The plan should be updated and published on a regular basis (Figure 2).



**Figure 2:** One year in a project – Day 19.

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Status reports should always emphasize the anticipated end point in terms of cost, schedule and quality of deliverables. Each project deliverable produced should be reviewed for quality and measured against the acceptance criteria. Once all of the deliverables have been produced and the customer has accepted the final solution, the project is ready for closure.

## Closure phase

During the final closure, or *closeout phase*, the emphasis is on releasing the final deliverables to the customer, handing over project documentation to the business, terminating supplier contracts, releasing project resources and communicating the closure of the project to all stakeholders. The last remaining step is to conduct lessons learned studies; to examine what went well and what didn't. Through this type of analysis the wisdom of experience is transferred back to the project organization, which will help future project teams.

## Bibliography

- J. Westland, *The Project Management Lifecycle*, Kogan Page Limited (2006).



# Project Initiation<sup>10</sup>

The project *initiation phase* is the first phase within the project management life cycle, as it involves starting up a new project. Within the initiation phase, the business problem or opportunity is identified, a solution is defined, a project is formed, and a project team is appointed to build and deliver the solution to the customer. A business case is created to define the problem or opportunity in detail and identify a preferred solution for implementation. The business case includes:

- A detailed description of the problem or opportunity
- A list of the alternative solutions available
- An analysis of the business benefits, costs, risks and issues
- A description of the preferred solution
- A summarized plan for implementation

The project sponsor then approves the business case, and the required funding is allocated to proceed with a *feasibility study*. It is up to the project sponsor to determine if the project is worth undertaking and whether the project will be profitable to the organization. The completion and approval of the feasibility study triggers the beginning of the *planning phase*. The feasibility study may also show that the project is not worth pursuing and the project is terminated; thus the next phase never begins.

All projects are created for a reason. Someone identifies a need and devises a project to address that need. How well the project ultimately addresses that need defines the project's success or failure.

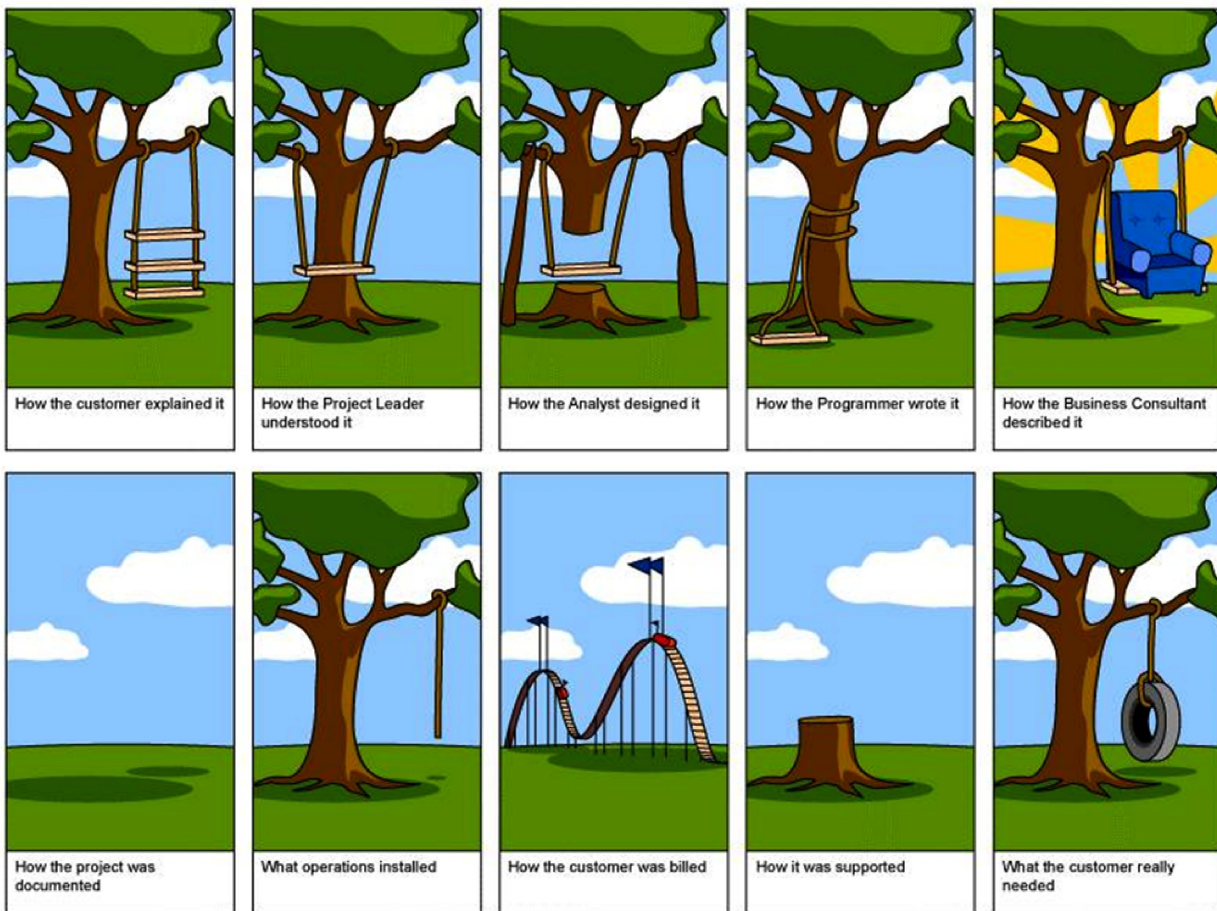
The success of your project depends on the clarity and accuracy of your business case and whether people believe they can achieve it. Whenever you consider past experience, your business case is more realistic; and whenever you involve people in the business case's development, you encourage their commitment to achieving it.

Often the pressure to get results encourages people to go right into identifying possible solutions without fully understanding the need; what the project is trying to accomplish. This strategy can create a lot of immediate activity but it also creates significant chances for waste and mistakes if the wrong need is addressed. One of the best ways to gain approval for a project is to clearly identify the project's objectives and describe the need or problem for which the project will provide a solution.

For most of us, being misunderstood is a common occurrence, something that happens on a daily basis. At the restaurant the waiter brings us our dinner and we note that the baked potato is filled with sour cream, even though we expressly requested "no sour cream". Projects are filled with misunderstandings between customers and project staff. What the customer's order (or more accurately what they think they order) is often not what they get. This is illustrated in a popular cartoon (Figure 1) called "I know that's what I said, but it's not what I meant!" The cartoon demonstrates the importance of establishing clear objectives.

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<sup>10</sup>This content is available online at <<http://cnx.org/content/m31947/1.3/>>.



**Figure 1:** I know that's what I said, but it's not what I meant!

The need for establishing clear project objectives cannot be overstated. An objective or goal lacks clarity if, when shown to five people, it is interpreted in multiple ways. Ideally, if an objective is clear, you can show it to five people who, after reviewing it, hold a single view about its meaning. The best way to make an objective clear is to state it such a way that it can be verified. Building in measures can do this. It is important to provide quantifiable definitions to qualitative terms.

For example, an objective of the team principle (project manager) of a Formula 1 racing team may be that their star driver, “finish the lap as fast as possible.” That objective is filled with ambiguity.

- How fast is “fast as possible?” Does that mean the fastest lap time (the time to complete one lap) or does it mean the fastest speed as the car crosses the start/finish line (that is at the finish of the lap)?
- By when should the driver be able to achieve the objective? It is no use having the fastest lap after the race has finished, and equally the fastest lap does not count for qualifying, and therefore grid (starting) position, if it is performed during a practice session.

The ambiguity of this objective can be seen from the following example. The race lap record at the Circuit de Monaco of 1 min 14.439 sec was achieved by Ferrari's Michael Schumacher in 2004 (Figure 2). However, he achieved this on lap 23 of the race, but crashed on lap 45 of a 77 lap race! So while he achieved a fastest lap and therefore met the specific project goal of "finish the lap as fast as possible", it did not result in winning the race, clearly a different project goal. In contrast, the fastest *qualifying* time at the same event was by Renault's Jarno Trulli (1 min 13.985 sec), which gained him pole position for the race, in which he went on to win (Figure 3). In his case he also achieved the specific project goal of "finish the lap as fast as possible", but also the larger goal of winning the race!



**Figure 2:** Despite achieving the project goal of the "finish the lap as fast as possible" Ferrari's Michael Schumacher crashed 21 laps later and did not finish the race.



**Figure 3:** Renault's Jarno Trulli celebrating his win at the 2004 Monaco Grand Prix.

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The objective can be strengthened considerably if it is stated as follows: "To be able to finish the 3.340 km lap at the Circuit de Monaco at the Monaco Grand Prix in 1 min 14.902 sec or less, during qualifying

on 23<sup>th</sup> May, 2009. This was the project objective achieved by Brawn GP's Jenson Button (Figure 4).



**Figure 4:** Jenson Button took his Brawn GP car to pole position at the Monaco Grand Prix with a lap time of 1 min 14.902 sec. He also went on to with the race, even though he did not achieve that lap time during the race.

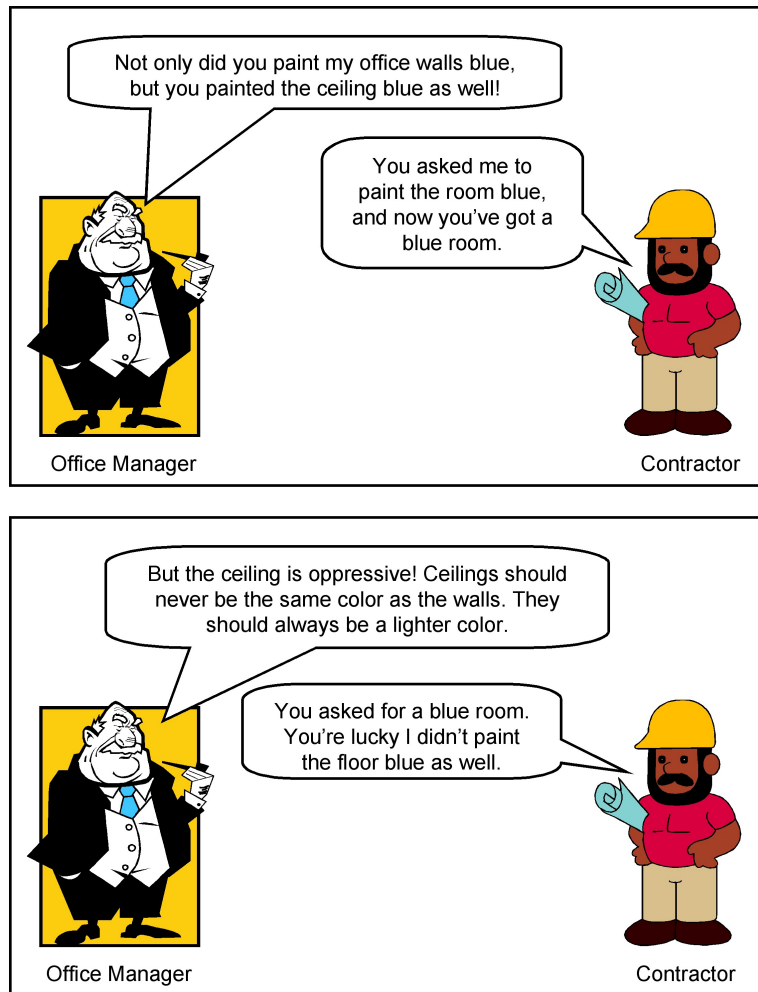
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There is still some ambiguity in this objective; for example, it assumes the star driver will be driving the team's race car and not a rental car from Hertz! However, it clarifies the team principal's intent quite nicely. It should be noted that a clear goal is not enough. It must also be achievable. The team principal's goal becomes unachievable, for example, if he changes it to require his star driver finish the 3.340 km lap in 30 seconds or less.

To ensure the project's objectives are achievable and realistic, they must be determined jointly by managers and those who perform the work. Realism is introduced because the people who will do the work have a good sense of what it takes to accomplish a particular task. In addition, this process assures some level of commitment on all sides; management expresses its commitment to support the work effort and worker demonstrate their wiliness to do the work.

Imagine you are an office manager and you have contracted a painter to paint your office. Your goal or objective is to have the office painted a pleasing blue color. Consider the following conversation that occurs after the job was finished:





**Figure 5:** The consequence of not making your objective clear.

This conversation captures in a nutshell the essence of a major source of misunderstandings on projects: The importance of setting clear objectives. The office manager's description of how he wanted the room painted meant one thing to him and another to the painter. As a consequence, the room was not painted to the office manager's satisfaction. Had his objective been more clearly defined, he probably would have had what he wanted.

**Exercise 1**

How could you make the objective for painting a room clear such that the office manager gets what he wanted?



# An Example of a Project Charter<sup>11</sup>

## Introduction

### Overview of the Project

Provide a simple but precise statement of the project.

#### Example

Rice University is planning to create a store to sell computer supplies.

### Purpose of the Project Charter

This *Project Charter* outlines the purpose, objectives, and scope of the project. The purpose of a Project Charter is:

- to provide an understanding of the project, the reason it is being conducted and its justification
- to establish early on in the project the general scope
- to establish the project manager and his or her authority level

A note of who will review and approve the Project Charter needs to be included.

#### Example

The Project Charter will be reviewed by the project team and approved. The final approval will be the Dean of Undergraduate Studies.

## Project Objective and Scope

### Objective

The objective of the project should “clearly stated” and contain a “measure” of how to assess whether they have been achieved. It should be realistic, and include the objectives. It should follow the SMART protocol:

- **S**pecific (get into the details)
- **M**asurable (use quantitative language so that you know when you are finished)
- **A**ceptable (to stakeholders)
- **R**ealistic (given project constraints)
- **T**ime based (deadlines, not durations)

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<sup>11</sup>This content is available online at <<http://cnx.org/content/m35736/1.1/>>.

**Example**

The objective of this project is to implement a campus store that is ready to sell computer supplies such as memory sticks, mouse pads, cables, etc. when class starts in August 2010, with enough inventory to last through the first two weeks of classes.

**Scope**

The scope of the project should be listed.

**Example**

The scope of the Rice's school supplies store project includes the activities listed below:

- Determine what supplies will be sold in the store
- Establish competitive prices for the computer supplies
- Source and secure supply vendors
- Establish marketing, procurement, operations and any other necessary departments, schools, centers and institutes.

It is equally important to include in the scope what is not included in the project.

**Example**

The scope of the project does *not* include:

- Development of any other school store departments
- Store design or construction

**Major Milestones**

A list of the milestones that are needed.

**Example**

- All vendors selected
- Contracts or orders complete with all vendors
- Supplies delivered to the store
- Pricing determined

**Major Deliverables**

A list of the major deliverables that will result from the project are described.

**Example**

- Procurement of supplies
- Establishment of operations, procurement, marketing and other teams
- Store supplies stocked and displayed
- Store staffing completed, including work schedules
- Establishment of store operations policies, including hours of operation

## Assumptions

The assumptions in creating the project are to be outlined.

### Example

- Only computer supplies will be sold in the store.
- Supplies customers will be the Rice University student body and faculty
- Rice University students will manage the project and be responsible for ongoing operations.
- A store sponsor from the University faculty or staff will be assigned to mentor students and to provide oversight.
- Store hours of operation will be approved by the Rice University students or store sponsor.
- Supply deliveries will be arranged or the store sponsor will pick them up with students.
- Students will be empowered to contact vendors for order placement and inquiries via telephone.

## Constraints

It is important to define any and all constraints on the project or those working on the project

### Example

- Student availability to meet for project planning is limited to school hours.
- The Rice University Student Association will be responsible for the creation and operation of the store.
- Software is not available for project planning and control.

## Business Need or Opportunity

Provide a concise statement of the business need or opportunity that led to the creation of the project.

### Example

The goal of this project is to provide income for the Rice Student Center while supplying necessary items to students and faculty at competitive prices. The school store will be a convenience to students since necessary supplies will be available on campus. This will help students to learn to manage their personal supplies.

## Preliminary Cost for the Project

A statement is to be provided indicating how the cost of the project will be defined and controlled.

### Example

The procurement team will assemble a proposal based on expected costs for review by the Dean of Undergraduate Studies.

## Project Charter Acceptance

The names, titles, and signature lines of the individuals who will sign-off on the Project Charter is provided.

**Example**

Approver for Rice University :

\_\_\_\_\_  
Prof. John S. Hutchinson  
Dean of Undergraduate Studies

\_\_\_\_\_  
Date

Project Manager Approval:

\_\_\_\_\_  
Merrie Barron  
Project Manager

\_\_\_\_\_  
Date

# Project Planning<sup>12</sup>

After the project has been defined and the project team has been appointed, you are ready to enter the second phase in the project management life cycle: the detailed *project planning* phase.

Project planning is the heart of the project life cycle, and tells everyone involved where you're going and how you're going to get there. The planning phase is where the project plans are documented, the project deliverables and requirements defined, and the project schedule created. It involves creating a set of plans to help guide your team through the execution and closure phases of the project. The plans created during this phase will help you to manage time, cost, quality, change, risk and related issues. It will also help you manage staff and external suppliers, to ensure that you deliver the project on time and within schedule.

The project planning phase is often the most challenging phase for a project manager, as you need to make an educated guess of the staff, resources and equipment needed to complete your project. You may also need to plan your communications and procurement activities, as well as contract any 3rd party suppliers.

The purpose of the project planning phase is:

- Establish business requirements.
- Establish cost, schedule, list of deliverables and delivery dates.
- Establish resource plan.
- Get management approval and proceed to the next phase.

The basic processes of the project planning are:

- **Scope planning** specifies the in-scope requirements for the project and facilitates creating the work breakdown structure.
- **Preparing the work breakdown structure** specifies the breakdown of the project into tasks and sub tasks.
- **Project schedule development** specifies the entire schedule of the activities detailing their sequence of execution.
- **Resource planning** specifies who will do what work at which time of the project and if any special skills are needed to accomplish the project tasks.
- **Budget planning** specifies the budgeted cost to be incurred in the completion of the project.
- **Procurement planning** focuses on dealing with vendors outside of your company
- **Risk management planning** charts the risks, contingency plan and mitigation strategies.
- **Quality planning** for quality assurance to be applied to the project.
- **Communication planning** on the communication strategy with all project stakeholders.

The planning phase refines the project's objectives gathered during the *initiation phase* and plans the steps necessary to meet those objectives by further identifying the specific activities and resources required to complete the project. Now that these objectives have been recognized, they must be clearly articulated entailing an in-depth scrutiny of the recognized objective. With such scrutiny, our understanding of the objective will change. Often the very act of trying to describe something precisely gives us a better understanding of what we are looking at. This articulation serves as the basis for the development of requirements. What this

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<sup>12</sup>This content is available online at <<http://cnx.org/content/m32170/1.7/>>.

means is that after an objective has been clearly articulated (clearly stated) we can go about the business of stipulating in concrete terms what we have to do to achieve it. Obviously, if we do a poor job of articulating the objective, our requirements will be misdirected and the resulting project will not represent the true need.

Users will often begin describing their objectives in qualitative language. The project manager must work with the user to provide quantifiable definitions to those qualitative terms. These quantifiable criteria include: schedule, cost, and quality measures. In the case of project objectives, these elements are used as measurements to determine project satisfaction and successful completion. Subjective evaluations can be removed with actual numbers.

**Example**

A web user may ask for a *fast system*. The quantitative example would be *all screens must load in under 3 seconds*. Describing the time limit in which the screen must load is specific and tangible. For that reason, you'll know that the requirement has been completed when the objective has been met.

**Example**

Let's say your company is going to produce a run of holiday eggnog. Your objective statement might be stated this way: *Christmas Cheer, Inc. will produce two million cases of holiday eggnog to be shipped to our distributors by October 30 at a total cost of \$1.5 million or less*. The objective criteria in this statement are clearly stated and fulfillment of the project objective can be easily measured. Stakeholders will know the objective is met when the two million cases are produced and shipped by the due date within the budget stated.

When articulating the project objectives you should follow the SMART rule:

- **Specific** (get into the details). Objectives should be specific and written in clear, concise, and understandable terms.
- **Measurable** (use qualitative language so you know when you are finished). A requirement must have a measurable outcome; otherwise you will not be able to determine when you have delivered it.
- **Acceptable** (to stakeholders).
- **Realistic** (in terms of achievement). Objectives that are impossible to accomplish are not realistic and not attainable. Objectives must be centered in reality.
- **Time bound** (deadlines not durations). Objectives should have a timeframe with an end date assigned to them.

If you follow these principles, you'll be certain that your objectives meet the *quantifiable criteria* needed to measure success.

## Scope planning

You always want to know exactly what work has to be done to finish your project **BEFORE** you start it. You've got a collection of team members, and you need to know exactly what they're going to do to build your product or meet the project's objectives. The scope planning process is the very first thing you do to manage your scope. Project scope planning is concerned with defining all of the work of the project and only the work needed to successfully meet the project objectives. The whole idea here is that when you start the project, you need to have a clear picture of all the work that needs to happen on your project, and as the project progresses, you need to keep that scope up to date and written down in the project's *scope management plan*.

### How do you define the scope?

You already got a head start on refining the project's objectives in quantifiable terms, but now you need to go a lot further and write down all of the deliverables that you and your team are going to produce over



the course of the project. Deliverables include everything that you and your team produce for the project; anything that your project will deliver. The deliverables for your project include all of the products or services that you and your team are performing for the client, customer, or sponsor. But deliverables include more than that. They also include every single document, plan, schedule, budget, blueprint, and anything else that gets made along the way; including all of the project management documents you put together. Project deliverables are measurable outcomes, measurable results, or specific items that must be produced to consider the project or project phase completed. Deliverables like objectives must be specific and verifiable.

All deliverables must be described in enough detail so that they can be differentiated from related deliverables. For example:

- A twin engine plane versus a single engine plane.
- A red marker versus a green marker.
- A daily report versus a weekly report.
- A departmental solution versus an enterprise solution.

One of the project manager's primary functions is to accurately document the deliverables and requirements of the project and then manage the project so that they are produced according to the agreed upon criteria. Deliverables describe the components of the goals and objectives in a quantifiable way. Requirements are the specifications of the deliverables.

## Project requirements

After all the deliverables are identified, the project manager needs to discover and document all of the requirements of the project (Figure 1). Requirements describe the characteristics of the deliverable. They may also describe functionality that the deliverable must have or specific conditions the deliverable must meet in order to satisfy the objective of the project. A requirement is an objective that must be met. The project requirements defined in the *scope plan* describe what a project is supposed to accomplish and how the project is supposed to be created and implemented. Requirements answer the following questions regarding the AS IS and TO BE states of the business: who, what where, when, how much, how does a business process work.



Figure 1: When you don't get project requirements. Copyright: United Feature Syndicate, Inc. (2009).

Requirements may include things like dimensions, ease of use, color, specific ingredients, and so on. If we go back to the example of the company producing holiday eggnog; one of the major deliverables is the cartons that hold the eggnog. The requirements for that deliverable may include carton design, photographs that will appear on the carton, color choices, etc.

Requirements specify what the project deliverable should look like and what it should do. They can be divided into six basic categories, functional, non-functional, technical, user, business, and regulatory requirements.

### Functional requirements

Functional requirements describe the characteristics of the deliverable, what emerges from the project in ordinary non-technical language. They should be understandable to the customers, and the customers should play a direct role in their development. Functional requirements are what you want the deliverable to do.

#### Example

If you were buying vehicles for a business your functional requirement might be; *the vehicle should be able to take a load from a warehouse to a shop.*

#### Example

For a computer system you may define what the system is to do; *the system should store all details of a customer's order.*

The important point to note is that WHAT is wanted is specified, and not HOW it will be delivered.

### Non-functional requirements

Non-functional requirements specify criteria that can be used to judge the product or service that your project delivers. They are restrictions or constraints to be placed on the deliverable and how to build it. Their purpose is to restrict the number of solutions that will meet a set of requirements. Using the vehicle example (Example ); without any constraints, the functional requirement of a vehicle to take a load from a warehouse to a shop, the solutions being offered might result in anything from a large truck to a sports car! Non-functional requirements can be split into two types: performance and development.

To restrict the types of solutions you might include these performance constraints:

- It must take a load of at least one ton.
- The load area must be covered.
- The load area must have a height of at least 10 feet.

Similarly, for the computer system example (Example ), you might specify values for the generic types of performance constraints:

- The response time for information to appear to a user.
- The number of hours a system should be available.
- The number of records a system should be able to hold.
- The capacity for growth of the system.
- The length of time a record should be held for auditing purposes.

For the customer records example these might be:

- The system should be available from 9 AM to 5 PM Monday to Friday.
- The system should be able to hold 100,000 customer records initially.
- The system should be able to add 10,000 records a year for 10 years.
- A record should be fully available on the system for at least 7 years.

The important point with these examples is that they restrict the number of solution options that are offered to you by the developer. In addition to the performance constraints you may include some development constraints.

There are three general types of development constraints:

- **Time:** When a deliverable should be delivered
- **Resource:** How much money is available to develop the deliverable
- **Quality:** Any standards that are used to develop the deliverable, and develop methods, etc.

### **Technical requirements**

Technical requirements emerge from the functional requirements, they answer the question, and how will the problem be solved this time; will it be solved technologically and/or procedurally. They answer how the system needs to be designed and implemented to provide required functionality and fulfill required operational characteristics. For example, in a software project, the functional requirements may stipulate that a data base system will be developed to allow access to financial data through a remote terminal; the corresponding technical requirements would spell out the architecture of the data structure, the language in which the database management system will be written, the hardware on which the system will run, telecommunication protocols that should be used and so forth.

### **User requirements**

User requirements are what the users need to do with the system or product. They focus on the experience users need to have with the system, they can also reflect how the product will be designed, and define how test cases must be formulated.

### **Business requirements**

Business requirements are the needs of the sponsoring organization, always from a management perspective. Business requirements are statements of the business rationale for the project. They are usually expressed in broad outcomes the business requires, rather than specific functions the system may perform. These requirements grow out of the vision for the product that, in turn, is driven by mission (or business) goals and objectives.

### **Regulatory requirements**

Regulatory requirements can be internal or external and are usually non-negotiable. They are the restrictions, licenses and laws applicable to a product or business, imposed by the government.

### **An example of requirements**

Automated teller machines (ATMs) can be used to illustrate a wide range of requirements (Figure 2). What are some of the physical features of these machines, and what kinds of functions do they perform for users? Why did banks put these systems in place? What high level business requirements did they have in mind?



**Figure 2:** A typical exterior automated teller machines (ATMs).

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The following represents one possible example of each type of requirement as they would be applied to a bank's external ATM.

- **ATM function requirement:** The system shall provide users with the ability to select whether or not to produce a hardcopy transaction receipt before completing a transaction.
- **ATM non-functional requirement:** All displays shall be in white 14 pt Arial text on black background.
- **ATM user requirement:** The system shall complete a standard withdrawal from a personal account, from login to cash, in less than two minutes for a first time user.
- **ATM business requirement:** By providing superior service to our retail customers, Monumental Bank's ATM network will allow us to increase associated service fee revenue by 10% annually on an ongoing basis, using a baseline of December 2008.
- **ATM regulatory requirement:** All ATMs shall connect to standard utility power sources within their civic jurisdiction, and be supplied with uninterruptible power source approved by said company.

The effective specification of requirements is one of the most challenging undertakings project managers face. Inadequately specified requirements will guarantee poor project results.

Documenting requirements is much more than just the process of writing down the requirements as the user sees them; it should cover not only what decisions have been made but also why they have been made. Understanding the reasoning that used to arrive at a decision is critical in avoiding repetition. For example, if a particular feature has been excluded because it is simply not feasible, that fact needs to be recorded. If it is not, then the project risks wasted work and repetition when a stakeholder requests the feature be reinstated during development or testing. Once the requirements are documented, have the stakeholders sign off on their requirements as a confirmation of what they desire.

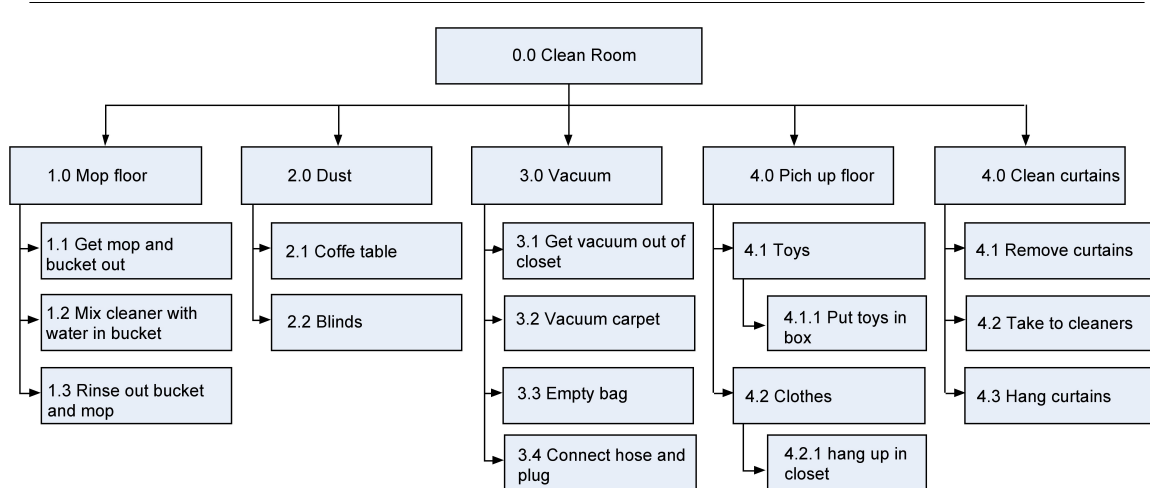
While the project manager is responsible for making certain the requirements are documented, it does not mean the project manager must perform this task. The project manager can enlist the help of stakeholders, business analysts, requirement analysts, business process owners, and other team members to conduct

the interviews and document the requirements. The project manager then reviews the requirements and incorporates them into the project documentation and project plan.

## Preparing the work breakdown structure

Now that we have the deliverables and requirements well defined, the process of breaking down the work of the project via a work breakdown structure begins. The work breakdown structure (WBS) defines the scope of the project and breaks the work down into components that can be scheduled and estimated and easily monitored and controlled. The idea behind the work breakdown schedule is simple. You subdivide a complicated task into smaller tasks, until you reach a level that cannot be further subdivided. Anyone familiar with the arrangements of folders and files in a computer memory, or who has researched their ancestral family tree, should be familiar with this idea. You stop breaking down the work when you reach a low enough level to perform an estimate of the desired accuracy. At that point, it is usually easier to estimate how long the small task will take and how much it will cost to perform than it would have been to estimate these factors at the higher levels. Each descending level of the WBS represents an increased level of detailed definition of the project work.

As an example, if I want to clean a room, I might begin by picking up clothes, toys, and other things that have been dropped on the floor. I could use a vacuum cleaner to get dirt out of the carpet. I might take down the curtains and take them to the cleaners, then dust the furniture. All of these tasks are subtasks performed to clean the room. As for vacuuming the room, I might have to get the vacuum cleaner out of the closet, connect the hose, empty the bag, and put the machine back in the closet. These are smaller tasks to be performed in accomplishing the subtask called vacuuming. The diagram in Figure 3 shows how this might be portrayed in WBS format.



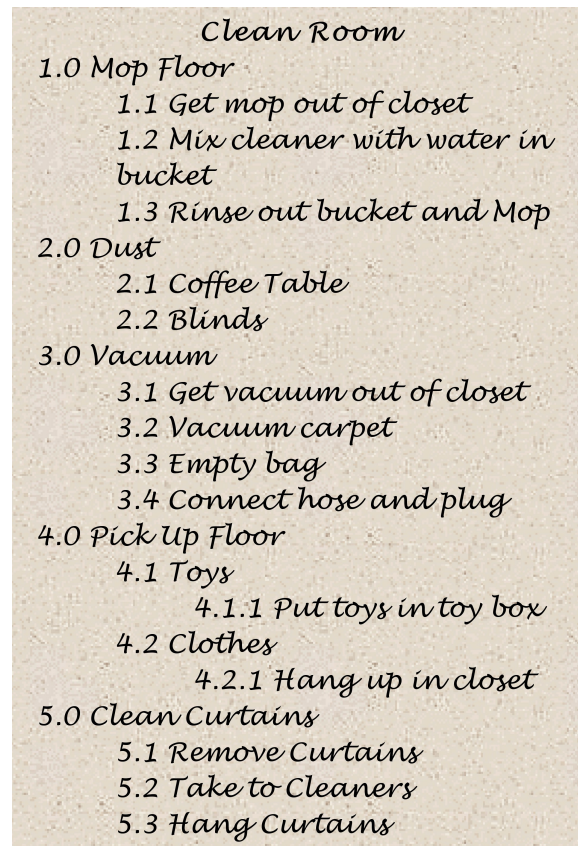
**Figure 3:** A work breakdown structure (WBS) for cleaning a room.

---

It is very important to note that we do not worry about the sequence in which the work is performed or any dependencies between them when we do a WBS. That will be worked out when we develop the schedule. For example, under *3.0 Vacuum* (in Figure 3), it would be obvious that *3.3 Vacuum carpet* would be performed after *3.4 Connect hose and plug*! However, you will probably find yourself thinking sequentially, as it seems to be human nature to do so. The main idea of creating a WBS is to capture all of the tasks,

irrespective of their order. So if you find yourself and other members of your team thinking sequentially, don't be too concerned, but don't get hung up on trying to diagram the sequence or you will slow down the process of task identification.

A WBS can be structured any way it makes sense to you and your project. In practice, the chart structure is used quite often (as in the example in Figure 3) but it can be composed in outline form as well (Figure 4).

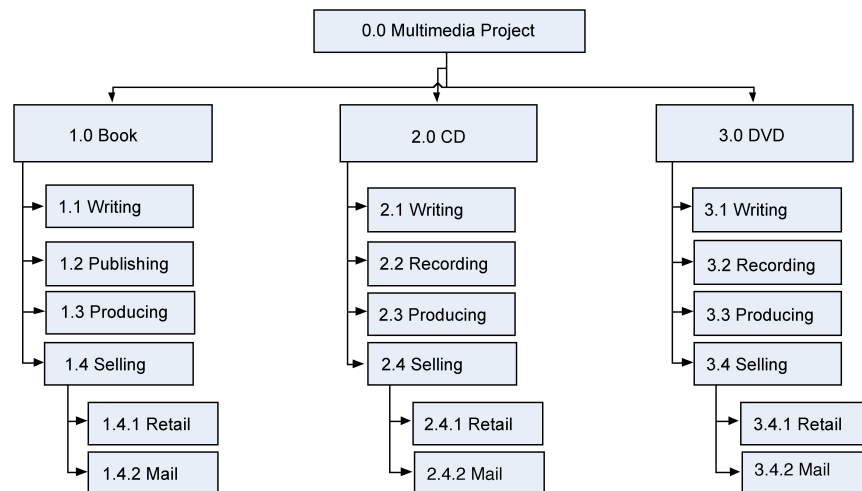


**Figure 4:** An outline format of a work breakdown structure (WBS) for cleaning a room.

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You'll notice that each element at each level of the WBS (in either Figure 3 or Figure 4) is assigned a unique identifier. This unique identifier is typically a number, and it's used to sum and track costs, schedules, and resources associated with WBS elements. These numbers are usually associated with the corporation's chart of accounts, which is used to track costs by category. Collectively, these numeric identifiers are known as the code of accounts.

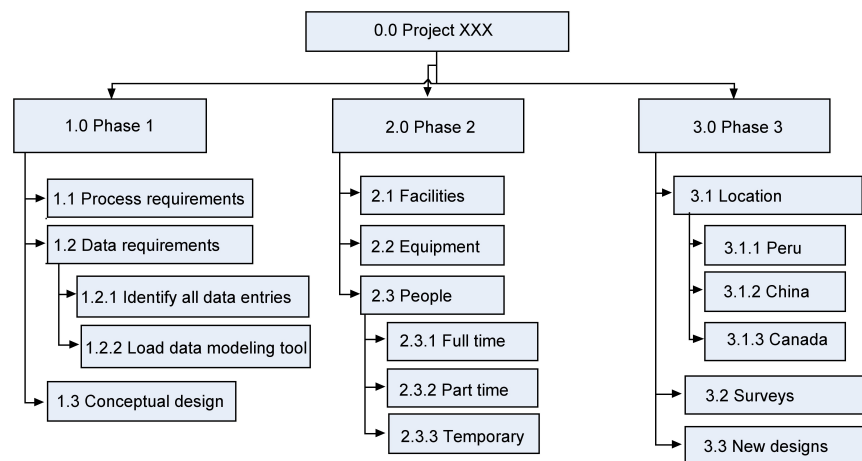
There are also many ways you can organize the WBS. For example, it can be organized by either deliverable or phase. The major deliverables of the project are used as the first level in the WBS. For example, if you are doing a multimedia project the deliverables might include producing a book, CD and a DVD (Figure 5).



**Figure 5:** An example of a work breakdown structure (WBS) based on project deliverable.

---

Many projects are structured or organized by project phases. Each phase would represent the first level of the WBS and their deliverables would be the next level and so on (Figure 6).



**Figure 6:** An example of a work breakdown structure (WBS) based on project phase.

---

As mentioned earlier, the project manager is free to determine the number of levels in the WBS based on the complexity of the project. You need to include enough levels to accurately estimate project time and costs but not so many levels that are difficult to distinguish between components. Regardless of the number of levels in a WBS, the lowest level in a WBS is called a work package.

Work packages are the components that can be easily assigned to one person, or team of people, with clear accountability and responsibility for completing the assignment. The work package level is where time estimates, costs estimates and resource estimates are determined.

## Project schedule development

Now we're off and running toward the development of our project schedule. In order to develop our schedule, we first need to define the activities, sequence them in the right order, estimate resources and estimate the time it will take to complete the tasks.

The activity definition process is a further breakdown of the work package elements of the WBS. It documents the specific activities needed to fulfill the deliverable detailed in the WBS. These are not deliverables but the individual units of work that must be completed to fulfill the deliverables. Activity definition uses everything we already know about the project to divide the work into activities that can be estimated. You might want to look at all the lessons learned from similar projects your company has done to get a good idea of what you need to do on the current one.

Expert judgment in the form of project team members with prior experience developing project scope statements and WBS can help you define activities. You might also use experts in a particular field to help define tasks if you were asked to manage a project in a new domain; to help you understand what activities were going to be involved. It could be that you create an activity list and then have the expert review it and suggest changes. Alternatively, you could involve the expert from the very beginning and ask to have an activity definition conversation with him before even making your first draft of the list.

Sometimes you start a project without knowing a lot about the work that you'll be doing later. Rolling wave planning lets you plan and schedule only the stuff that you know enough about to plan well. When you don't know enough about a project to come up with a complete activity list, you can use a planning component as a placeholder until you know more. These are extra items put at high levels in the WBS to allow you to plan for the unknown.

### A case study

Susan and Steve have decided to tie the knot, but they don't have much time to plan their wedding. They want the big day to be unforgettable. They want to invite a lot of people and show them all a great time. They've always dreamed of a June wedding, but it's already January. Just thinking about all of the details involved is overwhelming. Somewhere around picking the paper for the invitations, the couple realizes they need help. Susan's been dreaming of the big day since she was 12, but it seems like there's so little time to do it all.



Steve, we need some help.



Don't worry. My sister's wedding planner was great. Let me give her a call.

So saying Steve calls the wedding planner Sally.





We want everything to be perfect.



There is so much to do! Invitations, food, guests, and music.



Oh no, we haven't even booked a place!



And it's got to be done right. We can't print the invitations until we have the menu planned. We can't do the seating arrangements until we have the RSVPs. We aren't sure what kind of band to get for the reception, or should it be a DJ? We're just overwhelmed.



My sister said you really saved her wedding. I know she gave you over a year to plan.



But I've always dreamed of a June wedding, and I'm not willing to give that up. I know it's late, but Sally can you help us?



Take it easy guys. I've got it under control. We've got a lot of people and activities to get under control. You guys really should have called six months ago, but we'll still make this wedding happen on time.

There's a lot to get done before June. Sally's going to need to figure out what work needs to be done before she does anything else. For this she starts to put together a to-do-list.

- Invitations
- Flowers
- Wedding Cake

- Dinner Menu
- Band

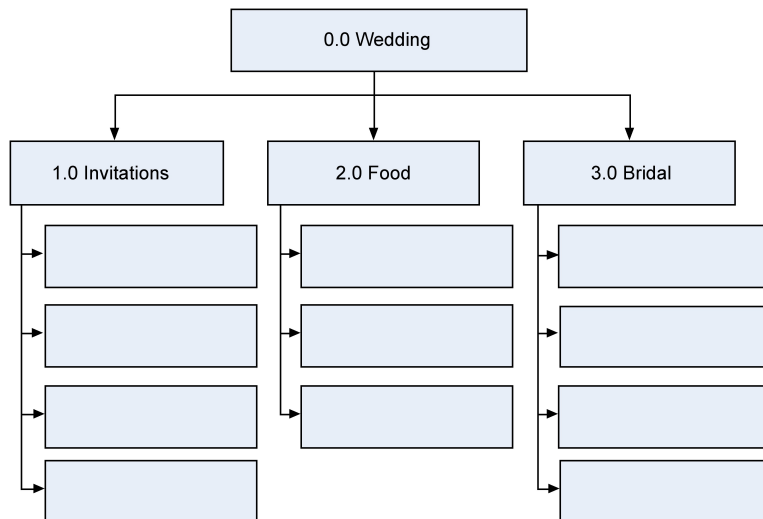
Since there are so many different people involved in making the wedding go smoothly, it takes a lot of planning to make sure all of the work happens in the right order, gets done by the right people and doesn't take too long. Initially, Sally was worried that she didn't have enough time to make sure everything was done properly. But she knew that she had some powerful time management tools on her side when she took the job, and they'll help her make sure that everything will work out fine.

To get started, Sally started arranging the activities in a work breakdown structure. This is part of the WBS Sally made for the wedding.

### Exercise 2

Arrange the following activities into the WBS to show how the work items decompose into activities.

- Shop for shoes
- Create guest list
- Tailoring and fitting
- Shop for dress
- Find caterer
- Cater the wedding
- Wait for RSVPs
- Mail the invitations
- Finalize the menu
- Print the invitations
- Choose the bouquet

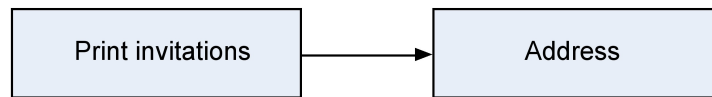


### Activity definition

Now that the *activity definitions* for the work packages have been completed, the next task is to complete the activity list. The *project activity list* is a list of everything that needs to be done to complete your project, including all the activities that must be accomplished to deliver the work package. Next you want to define the *activity attributes*. Here's where the description of each activity is kept. All of the information you need to figure out; the order of the work should be here too. So any *predecessor* activities, successor activities or constraints should be listed in the attributes along with descriptions and any other information

about resources or time that you need for planning. The three main kinds of predecessors are *finish-to-start* (FS), *start-to-start* (SS) and *finish-to-finish* (FF).

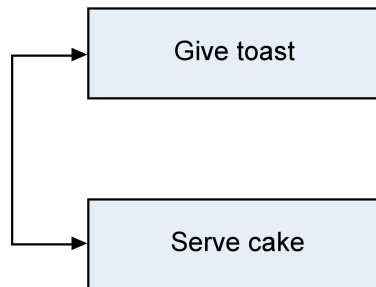
The most common kind of predecessor is the finish-to-start. It means that one task needs to be completed before another one can start. When you think of predecessors, this is what you usually think of, one thing needs to end before the next can begin. It's called *finish-to-start* because the first activity finish leads into the second activity's start (Figure 7).



**Figure 7:** An example of a finish-to-start (FS) predecessor.

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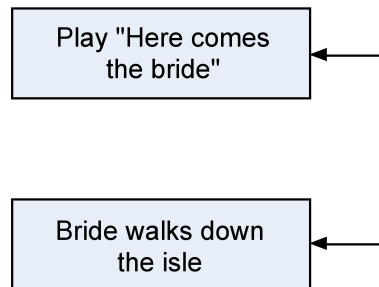
The start-to-start predecessor is a little less common, but sometimes you need to coordinate activities so they begin at the same time (Figure 8).



**Figure 8:** An example of a start-to-start (SS) predecessor.

---

In the finish-to-finish predecessor it shows activities that finish at the same time (Figure 9).



**Figure 9:** An example of a finish-to-finish (FF) predecessor.

---

It is possible to have to have start-to-finish (SF) predecessors. This happens when activities require that a task be started before it can finish. An example might be that singing couldn't start until after the music had started. Keep in mind that tasks like that are pretty rare and almost never show up in network diagrams. In addition there are some particular types of predecessors that must be considered.

#### **External predecessors**

Sometimes your project will depend on things outside the work your doing. For the wedding, we are depending on the wedding party before us to be out of the reception hall in time for us to decorate. The decoration of the reception hall then depends on that as an external predecessor.

#### **Discretionary predecessors**

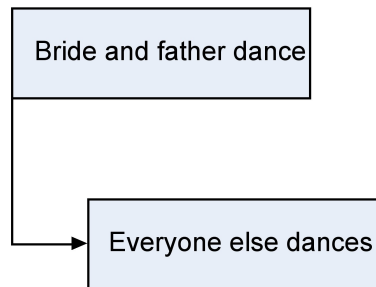
These are usually process or procedure driven or "best practice" techniques based on past experience. Using the wedding example: Steve and Susan really want the bridesmaids to arrive at the reception before the couple. There's no necessity there- it's just a matter of preference.

#### **Mandatory predecessors**

You can't address an invitation that hasn't been printed yet. So, printing invitations is a mandatory predecessor for addressing them. Mandatory predecessors are the kinds that have to exist just because of the nature of the work.

#### **Leads and lags**

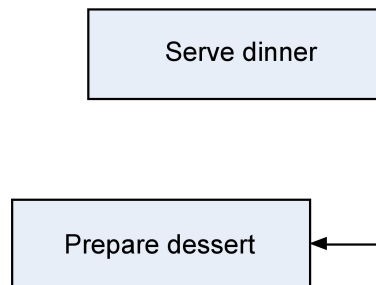
Sometimes you need to give some extra time between activities. *Lag time* is when you purposefully put a delay between the predecessor task and the successor. For example, when the bride and her father dance, everybody waits a while before they join them (Figure 10).



**Figure 10:** A lag means making sure that one task waits a while before it gets started.

---

*Lead time* is when you give a successor task some time to get started before the predecessor finishes (Figure 11). So you might want the caterer preparing dessert an hour before everybody is eating dinner.



**Figure 11:** A lead is when you let a task get started before its predecessor is done.

---

## Milestones

All of the important checkpoints of your project are tracked as milestones. Some of them could be listed in your contract as requirements of successful completion; some could just be significant points in the project that you want to keep track of. The milestone list needs to let everyone know which are required and which are not.

Some milestones for Susan and Steve's wedding might be:

- Invitations sent
- Menu finalized
- Location booked
- Bridesmaids' dresses fitted

As you figure out which activities will need to be done, you may realize that the scope needs to change. When that happens, you need to create a change request and send it through the change control system. So back to our couple and their nuptial plan.



We just got the programs back from the printer and they're all wrong.



The quartet cancelled. They had another wedding that day.



Aunt Jane is supposed to sing at the service, but after what happened at her uncle's funeral, I think I want someone else to do it.



Should we really have a pan flute player? I'm beginning to think it might be overkill.



Apparently! Maybe we should hold off printing the invitations until this stuff is worked out.



OK, let's think about exactly how we want to do this. I think we need to be sure about how we want the service to go before we do any more printing.

### The activity sequencing process

Now that we know what we have to do to make the wedding a success, we need to focus on the order of the work. Sally sat down with all of the activities she had defined for the wedding and decided to figure out exactly how they needed to happen. That's where she used the *activity sequencing process*.

The *activity attribute list* Sally created had most of the predecessors and successors necessary written in it. This is where she thought of what comes first, second, third, etc. Sally's *milestone list* had major pieces of work written down and there were a couple of changes to the scope she had discovered along the way that were approved and ready to go.

#### Example

**Milestone list:** Steve and Susan had asked that the invitations be printed at least three months in advance to be sure that everyone had time to RSVP. That's a milestone on Sally's list.

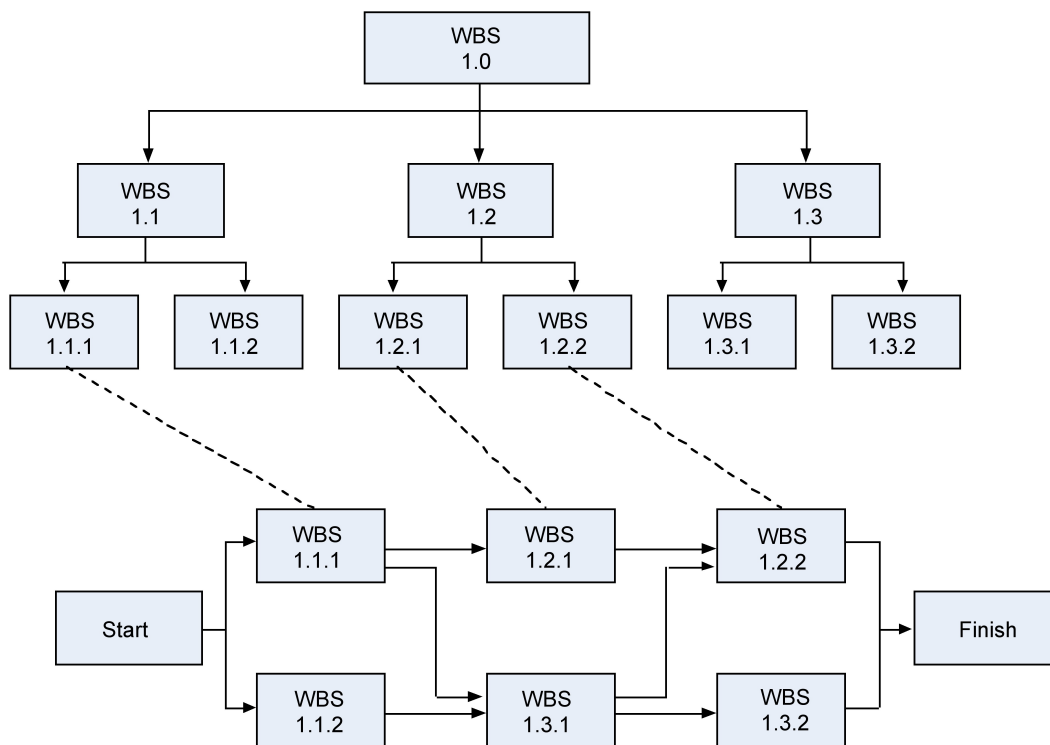
### Example

**Change request:** When Sally realized that Steve and Susan were going to need another limo to take the bridesmaids to the reception hall, she put that change through change control- including running everything by Susan's mother- and it was approved.

## Creating the network diagram

The first step in developing the schedule is to develop a network diagram of the WBS work packages. The *network diagram* is a way to visualize the interrelationships of project activities. Network diagrams provide a graphical view of the tasks and how they relate to one another. The tasks in the network are the work packages of the WBS. All of the WBS tasks must be included in the network because they have to be accounted for in the schedule. Leaving even one task out of the network could change the overall schedule duration, estimated costs and resource allocation commitments.

The first step is to arrange the tasks from your WBS into a sequence (Figure 12). Some tasks can be accomplished at any time throughout the project where other tasks depend on input from another task or are constrained by time or resources.

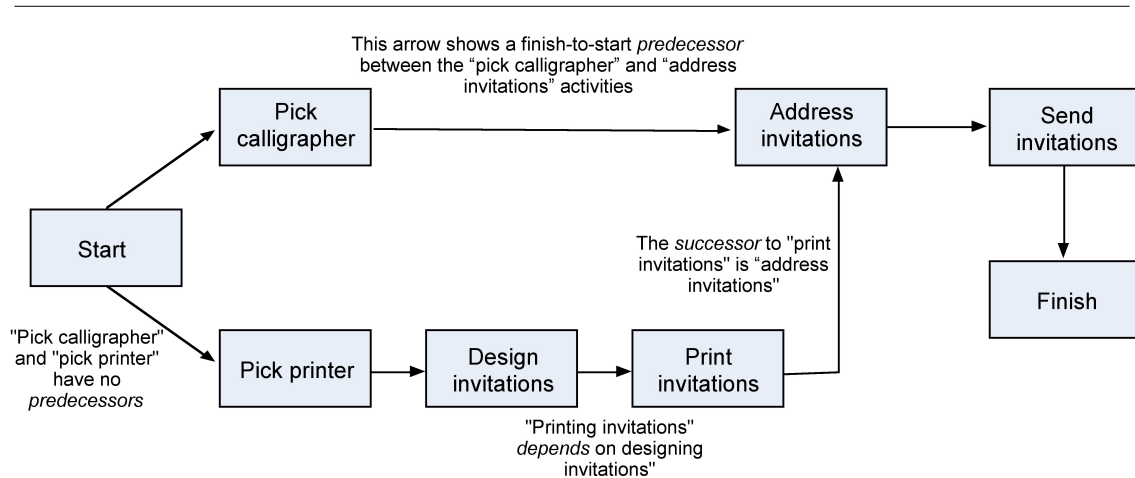


**Figure 12:** The relationship between the work breakdown structure (WBS) and the network diagram.

The WBS is not a schedule, but it is the basis for it; the network diagram is a schedule but is used primarily to identify key scheduling information that ultimately goes into user friendly schedule formats, such as milestone and Gantt charts.

The network diagram provides important information to the project team. It provides information about how the tasks are related (Figure 12), where the risk points are in the schedule, how long it will take as currently planned to finish the project, and when each task needs to begin and end.

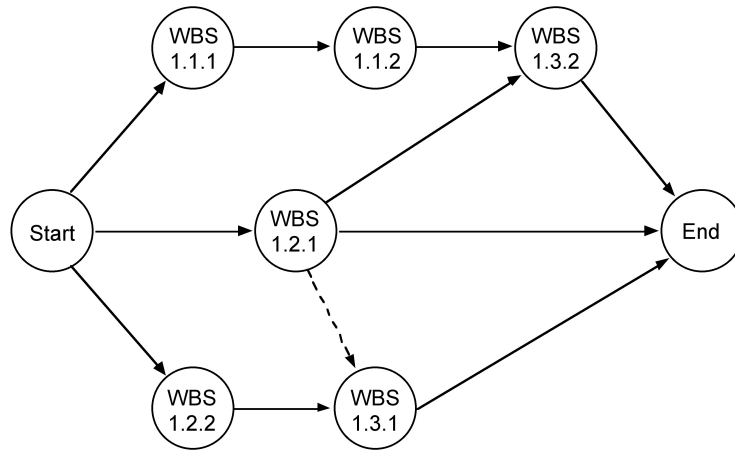
In our wedding planner example, Sally would look for relationships between tasks and determined what can be done in parallel and what activities needed to wait for others to complete. As an example, Figure 13 shows how the activities involved in producing the invitations depend on one another. Showing the activities in rectangles and their relationships as arrows is called a *precedence diagramming method* (PDM). This kind of diagram is also called an *activity on node* (AON) diagram.



**Figure 13:** An example of an activity on node (AON) diagram.

Another way to show how tasks relate is with the *activity-on-arrow* (AOA). Although *activity-on-node* (AON) is more commonly used and is supported by all project management programs, PERT is the best-known AOA-type diagram and is the historical basis of all network diagramming. The main difference is the AOA diagram is traditionally drawn using circles as the nodes, with nodes representing the beginning and ending points of the arrows or tasks. In the AOA network, the arrows represent the activities or tasks (Figure 14).





**Figure 14:** An example of an *activity-on-arrow* (AOA) network diagram.

---

All network diagrams have the advantages as showing task interdependencies, start and end times, and the critical path (the longest path through the network) but the AOA network also has some disadvantages that limit the use of the method.

The three major disadvantages of the AOA method are:

- The AOA network can only show finish to start relationships. It is not possible to show lead and lag except by adding or subtracting time, which makes project tracking difficult.
- There are instances when dummy activities can occur in an AOA network. Dummy activities are activities that show the dependency of one task on other tasks but for other than technical reasons. For example, a task may be dependent on another because it would be more cost effective to use the same resources for the two; otherwise the two tasks could be accomplished in parallel. Dummy activities do not have durations associated with them. They simply show that a task has some kind of dependence on another task.
- AOA diagrams are not as widely used as AON simply because the latter are somewhat simpler to use and all project management software programs can accommodate AON networks, whereas not all can accommodate AOA networks.

## Resource planning

In our case study it is clear that Steve and Susan have resource problems. Getting a handle on all of the tasks that have to be done is a great start, but it's not enough to know the tasks and the order they come in. Before you can put the final schedule together, you need to know who is going to each job, and the things they need available to them in order to do it!



We've got so much to do! Invitations, catering, music... and I've got no idea who's going to do it all. I'm totally overwhelmed.

From this statement it is clear that Susan is worried about human resources. In comparison, Steve realizes that not all resources are people!



And it's not just people! We need food, flowers, a cake, a sound system, and a venue! How do we get a handle on this?

Resources are people, equipment, locations, or anything else that you need in order to do all of the activities that you planned for. Every activity in your activity list needs to have resources assigned to it. Before you can assign resources to your project, you need to know which ones you're authorized to use; that's called resource availability. Resource availability includes information about what resources you can use on your project and when they're available to you. Don't forget that some resources like consultants or training rooms have to be scheduled in advance, and they might only be available at certain times. You'll need to know this before you can finish planning your project. If you are starting to plan in January, a June wedding is harder to plan than one in December, because the wedding halls are all booked up in advance. That is clearly a resource constraint. You'll also need the activity list that you created earlier, and you'll need to know about how your organization typically handles resources. Once you've got a handle on these things, you're set for resource estimation.

## Estimating the resources

The goal of activity resource estimating is to assign resources to each activity in the activity list. There are five tools and techniques for the activity resource estimating process. Some of them have technical sounding names, but they're all actually pretty sensible when you think about it. They should make sense to you when you think about what you have to do when you have to figure out what resources your project needs.

- **Expert judgment** means bringing in experts who have done this sort of work before and getting their opinions on what resources are needed (Figure 15).
- **Alternative analysis** means considering several different options for how you assign resources. This includes varying the number of resources as well as the kind of resources you use. Many times, there's more than one way to accomplish an activity and alternative analysis helps decide among the possibilities.
- **Published estimating data** is something that project managers in a lot of industries use to help them figure out how many resources they need. They rely on articles, books, journals, and periodicals that collect, analyze, and publish data from other people's projects.
- **Project management software** such as Microsoft project will often have features designed to help project managers estimate resource needs and constraints and find the best combination of assignments for the project.
- **Bottom-up estimating** means breaking down complex activities into pieces and working out the resource assignments for each piece. It is a process of estimating these individual activities or costs and then adding these up together to come up with a total estimate. Here you estimate every scheduled activity individually and then roll up that estimate; or add them all together, to come up with a total. Bottom-up estimating is a very accurate means of estimating, provided the estimates at the schedule activity level are accurate. However, it takes a considerable amount of time to perform bottom-up estimating because every activity must be accessed and estimated accurately to be included in the bottom-up calculation. The smaller and more detailed the activity, the greater the accuracy and cost of this technique.



**Figure 15:** “I know nothing about the subject but I am happy to give you my expert opinion”. Copyright Tribune Media Services (2007).

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In each of the following scenarios for planning Steve and Susan’s wedding determine which of the five activity resource estimation tools and techniques is being used.

**Exercise 3**

Sally has to figure out what to do for the music at Steve and Susan’s wedding. She considers using a DJ, a rock band, or a string quartet.

**Exercise 4**

The latest issue of *Wedding Planner’s Journal* has an article on working with caterers. It includes a table that shows how many waiters work with varied guest-list sizes.

**Exercise 5**

There’s a national wedding consultant who specializes in Caribbean themed weddings. Sally gets in touch with her to ask about menu options.

**Exercise 6**

Sally downloads and fills out a specialized spreadsheet that a project manager developed to help with wedding planning.

**Exercise 7**

There’s so much work that has to be done to set up the reception hall that Sally has to break it down into five different activities in order to assign jobs.

**Exercise 8**

Sally asks Steve and Susan to visit several different caterers and sample various potential items for the menu.

**Exercise 9**

Sally calls up her friend who knows specifics of the various venues in their area for advice on which one would work best.

## Estimating activity durations

Once you're done with *activity resource estimating*, you've got everything you need to figure out how long each activity will take. That's done in a process called *activity duration estimating*. This is where you look at each activity in the activity list, consider the scope and the resources and estimate how long it will take to perform.

Estimating the duration of an activity means starting with the information you have about that activity and the resources that are assigned to it, and then working with the project team to come up with an estimate. Most of the time you'll start with a rough estimate and then refine it to make it more accurate. You'll use these five tools and techniques to create the most accurate estimates:

- **Expert judgment** will come from your project team members who are familiar with the work that has to be done. If you don't get their opinion, then there's a huge risk that your estimates will be wrong.
- **Analogous estimating** is when you look at activities from previous projects that were similar to this one and look at how long it took to do similar work before. But this only works if the activities and the project team are similar!
- **Parametric estimating** means plugging data about your project into a formula, spreadsheet, database, or computer program that comes up with an estimate. The software or formula that you use for parametric estimating is built on a database of actual durations from past projects.
- **Three-point estimates** are when you come up with three numbers: a realistic estimate that's most likely to occur, an optimistic one that represents the best-case scenario, and a pessimistic one that represents the worst-case scenario. The final estimate is the average.
- **Reserve analysis** means adding extra time to the schedule (called a contingency reserve or a buffer) to account for extra risk.

In each of the following scenarios for planning Steve and Susan's wedding determine which of the five activity duration estimation tools and techniques is being used.

### Exercise 10

Sally comes up with three estimates (one where everything goes wrong, one where some things go wrong, and one where nothing goes wrong) for printing invitations, and average them together to come up with a final number.

### Exercise 11

Sally comes up with three estimates (one where everything goes wrong, one where some things go wrong, and one where nothing goes wrong) for printing invitations, and averages them together to come up with a final number.

### Exercise 12

There are two different catering companies at the wedding. Sally asks the head chef at each of them to give her an estimate of how long it will take each of them to do the job.

### Exercise 13

There's a spreadsheet Sally always uses to figure out how long it takes guest to RSVP. She enters the number of guests and their zip codes, and it calculates estimates for her.

### Exercise 14

Sally's done four weddings that are very similar to Steve and Susan's, and in all four of them it took exactly the same amount of time for the caterers to set up the reception hall.

You've got a list of activities, you know what resources are needed to actually do each activity, and you've got your estimation tools and techniques, now you have enough information to create the estimate! The *activity duration estimates* are an estimate of how long each activity in the activity list will take. This is a quantitative measure usually expressed in hours, weeks, days, or months. Any work period is fine, and you'll use different work periods for different jobs. A small job (like booking a DJ) may just take a few hours; a

bigger job (like catering-including deciding on a menu, ordering ingredients, cook food and serving guests on the big day) could take days.

Another thing to keep in mind when estimating the duration of the activities, is determining the effort involved. Duration is the amount of the time that an activity takes, while effort is the total number of person-hours that are expended. If it takes two people six hours to carve the ice sculpture for the centerpiece of a wedding, the duration is six hours. But if two people worked on it for the whole time, it took twelve person-hours of effort to create!

You'll also learn more about the specific activities while you're estimating them. That's something that always happens. You have to really think through all of the aspects of a task in order to estimate it. As you learn more about the specific activities remember to update the *activity attributes*.

If we go back to our case study of the wedding we can see that while Sally has got a handle on how long things are going to take, that's not enough to get the job done. She still has some work to do before she's got the whole project under control. Steve and Susan know where they want to get married, and they've got the place booked now, but what about the caterer? They have no idea who's going to be providing food. And what about the band they want? Will the timing with their schedule work out?



If the caterers come too early, the food will sit around under heat lamps! But, if they come too late, then the band won't have time to play. I just don't see how we'll ever work this out!

It's not easy to plan for a lot of resources when they have tight time restrictions and overlapping constraints. How do you figure out a schedule that makes everything fit together? You're never going to have the complete resource picture until you're done building the schedule. And the same goes for your *activity list* and *duration estimates* too! It's only when you lay out the schedule that you'll figure out that some of your activities and durations didn't quite work.

## Project schedule

The project schedule should be approved and signed off by stakeholders and functional managers. This assures they have read the schedule, understand the dates and resource commitments, and will likely cooperate. You'll also need to obtain confirmation that will be available as outlined in the schedule. The schedule cannot be finalized until you receive approval and commitment for the resource assignments outlined in it.

Once the schedule is approved, it will become your baseline for the remainder of the project. Project progress and task completion will be monitored and tracked against the project schedule to determine if the project is on course as planned.

The schedule can be displayed in a variety of ways, some of which are variations of what you have already seen. Project schedule network diagrams will work as schedule diagrams when you add the start and finish dates to each activity. These diagrams usually show the activity dependencies and critical path.

The critical path method is an important tool for keeping your projects on track. Every network diagram has something that is called the critical path. It's the string of activities that, if you add up all of the durations, is longer than any other path through the network. It usually starts with the first activity in the network and usually ends with the last one.



Aunt Jane is a vegetarian. That won't be a problem, right?



Well, let's see. What menu did we give the caterers?



We didn't give it to them yet; because we won't have the final menu until everyone RSVPs and lets us know which entrée they want.



But they can't RSVP because we haven't sent out the invitations! What's holding that up?



We're still waiting to get them back from the printer. We can't send them out if we don't have them yet!



Oh no! I still have to tell the printer what to print on the invitations, and what paper to use.



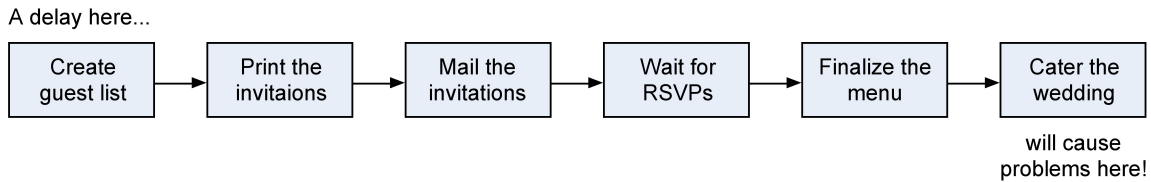
But you were waiting on that until we finished the guest list.



What a mess!

Steve thought Aunt Jane being a vegetarian was just a little problem. But it turns out to be a lot bigger than either Steve or Susan realized at first! How'd a question about one guest's meal lead to such a huge mess?

The reason that the critical path is *critical* is that every single activity on the path must finish on time in order for the project to come in on time. A delay in any one of the critical path activities will cause the entire project to be delayed (Figure 16).

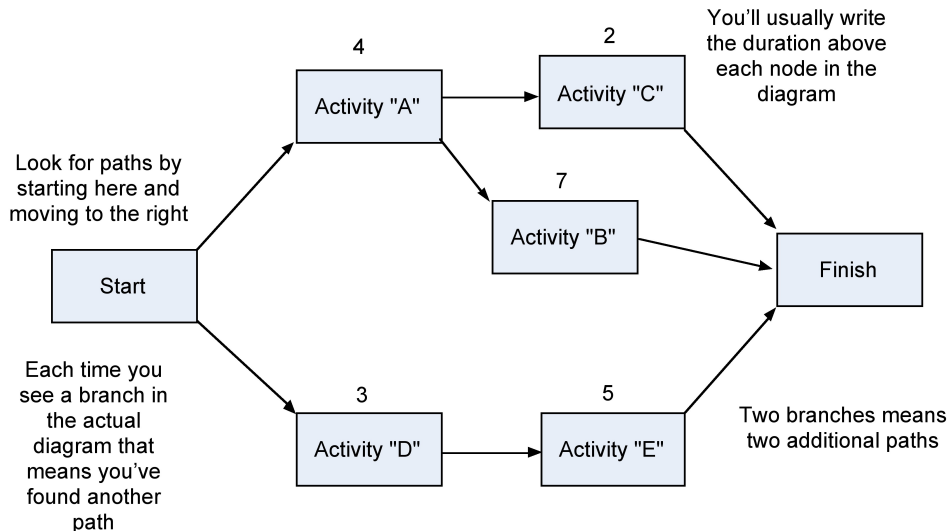


**Figure 16:** An example of problems that can be caused within the critical path.

Knowing where your critical path is can give you a lot of freedom. If you know an activity is not on the critical path, then you know a delay in that activity may not necessarily delay the project. This can really help you handle emergency situations. Even better, it means that if you need to bring your project in earlier than was originally planned, you know that by adding resources to the critical path will be much more effective than adding them elsewhere.

It's easy to find the critical path in any project! Of course, on a large project with dozens or hundreds of tasks, you'll probably use software like Microsoft Project to find the critical path for you. But when it does, it's following the same exact steps that are followed here.

Step 1. Start with a network diagram.



Step 2. Find all the paths in the diagram. A path is any string of activities that goes from the start of the project to the end.

Start → Activity "A" → Activity "B" → Finish

Start → Activity "A" → Activity "C" → Finish

Start → Activity "D" → Activity "E" → Finish

Step 3. Find the duration of each path by adding up the durations of each of the activities on the path.

Start → Activity "A" → Activity "B" → Finish = 4 + 7 = 11

Start → Activity "A" → Activity "C" → Finish = 4 + 2 = 6

Start → Activity “D” → Activity “E” → Finish = 3 + 5 = 8

Step 4. The first path has a duration of 11, which is longer than the other paths, so it’s the critical path!

The schedule can also be displayed using a *Gantt chart* (Figure 17). Gantt charts are easy to read and commonly used to display schedule activities. Depending on the software you use to display the Gantt chart, it might also show activity sequences, activity start and end dates, resource assignments, activity dependencies, and the critical path. Gantt charts are also known as bar charts.

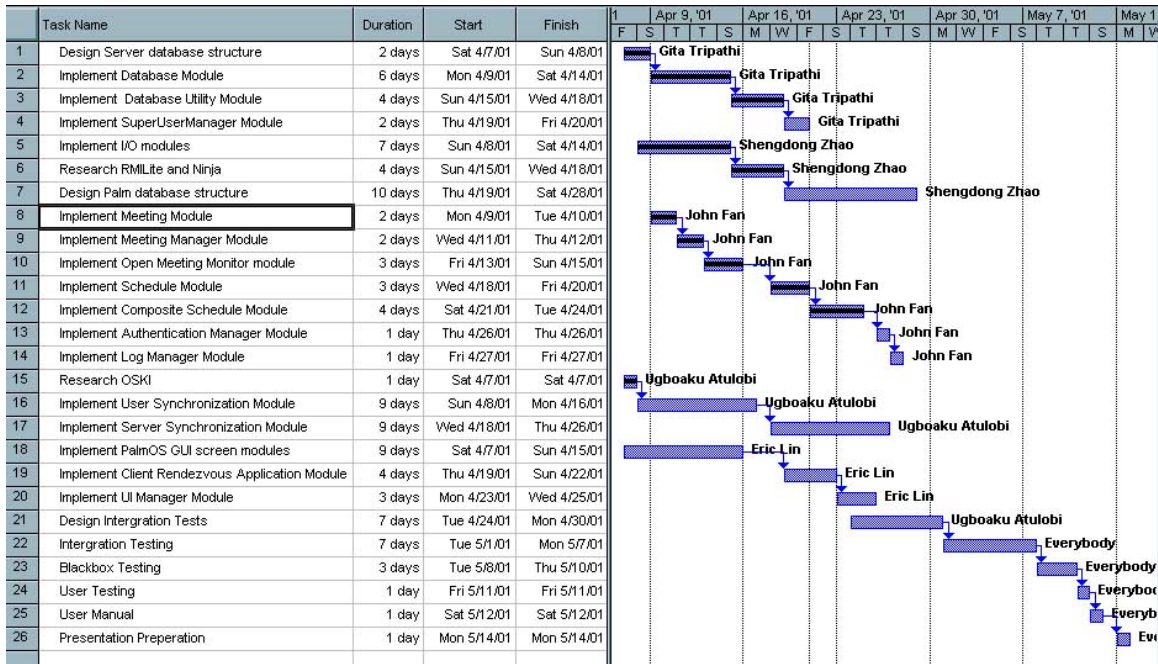
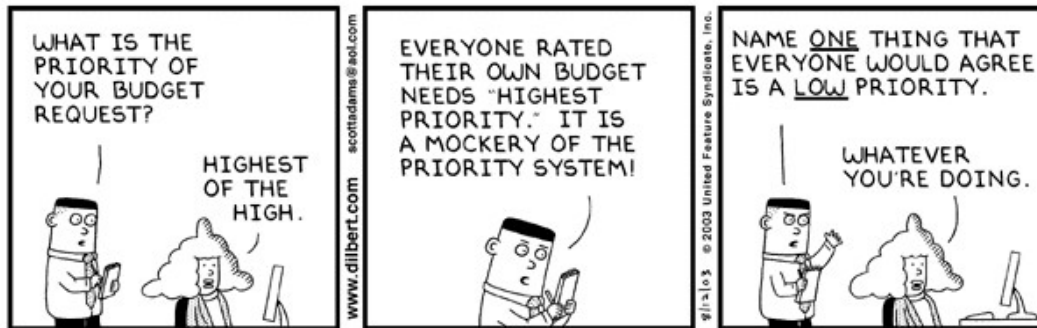


Figure 17: An example of a Gantt chart.

## Budget Planning

Every project boils down to money. If you had a bigger budget, you could probably get more people to do your project more quickly and deliver more. That’s why no project plan is complete until you come up with a budget (Figure 18). But no matter whether your project is big or small, and no matter how many resources and activities are in it, the process for figuring out the bottom line is always the same.





**Figure 18:** Defining the priority of a budget! Copyright: United Features Syndicate, Inc. (2003).

It is important to come up with detailed estimates of all the project costs. Once this is obtained, add up the cost estimates into a budget plan. It is now possible to track the project according to that budget while the work is ongoing.

A lot of times you come into a project and there is already an expectation of how much it will cost or how much time it will take. When you make an estimate really early in the project and you don't know much about it, that estimate is called a *rough order of magnitude* estimate (or a ballpark estimate). It's expected that this estimate will become more refined as time goes on and you learn more about the project. Here are some more tools and techniques used to estimate cost:

- **Determine resource cost rates:** People who will be working on the project all work at a specific rate. Any materials you will use to build the project (like wood or wiring) will be charged at a rate too. This just means figuring out what the rate for labor and materials will be.
- **Vendor bid analysis:** Sometimes you will need to work with an external contractor to get your project done. You might even have more than one contractor bid on the job. This tool is all about evaluating those bids and choosing the one you will go with.
- **Reserve analysis:** You need to set aside some money for cost overruns. If you know that your project has a risk of something expensive happening, better to have some cash lying around to deal with it. Reserve analysis means putting some cash away just in case.
- **Cost of quality:** You will need to figure the cost of all your quality related activities into the overall budget, too. Since it's cheaper to find bugs earlier in the project than later, there are always quality costs associated with everything your project produces. Cost of quality is just a way of tracking the cost of those activities and is how much money it takes to do the project right.

Once you apply all the tools in this process, you will arrive at an estimate for how much your project will cost. It's always important to keep all of your supporting estimate information, too. That way, you know the assumptions you made when you were coming up with your numbers. Now you are ready to build your budget plan.

## Procurement planning

Procurement management follows a logical order. First, you plan what you need to contract; then you plan how you'll do it. Next, you send out your contract requirements to sellers. They bid for the chance to work with you. You pick the best one, and then you sign the contract with them. Once the work begins, you

monitor it to make sure the contract is being followed. When the work is done, you close out the contract and fill out all the paperwork.

You will need to start with a plan for the whole project. You need to think about all of the work that you will contract out for your project before you do anything else. You will want to plan for any purchases and acquisitions. Here's where you take a close look at your needs, to be sure that you really need to create a contract. You figure out what kinds of contracts make sense for your project, and you try to define all of the parts of your project that will be contracted out.

Contract planning is where you plan out each individual contract for the project work. You work out how you manage the contract, what metrics it will need to meet to be considered successful, how you'll pick a seller, and how you'll administer the contract once the work is happening.

The *procurement management plan* details how the procurement process will be managed. It includes the following information:

- The types of contracts you plan to use, and any metrics that will be used to measure the contractor's performance.
- The planned delivery dates for the work or products you are contracting.
- The company's standard documents you will use.
- How many vendors or contractors are involved and how they will be managed.
- How purchasing may impact the constraints and assumptions of the project plan.
- Coordination of purchasing lead times with the development of the project schedule.
- Identification of prequalified sellers (if known).

The procurement management plan like all other management plans becomes a subsidiary of the project management plan. Some tools and techniques you may use during the procurement planning stage include make or buy analysis and defining the contract type.

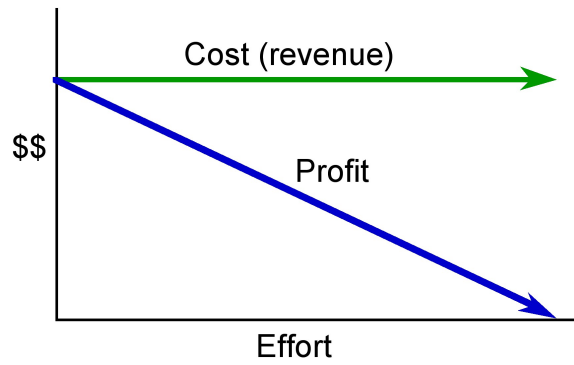
### Make or buy analysis

This means figuring out whether or not you should be contracting the work or doing it yourself. It could also mean deciding whether to build a solution to your problem or buy one that is already available. Most of the same factors that help you make every other major project decision will help you with this one. How much does it cost to build it as opposed to buy it? How will this decision affect the scope of your project? How about project schedule? Do you have time to do the work and still meet your commitments? As you plan out what you will and won't contract, you need to have thought through your reasoning pretty carefully.

There are some resources (like heavy equipment) that your company can buy, rent, or lease depending on the situation. You'll need to examine leasing versus buying costs and determine the best way to go forward.

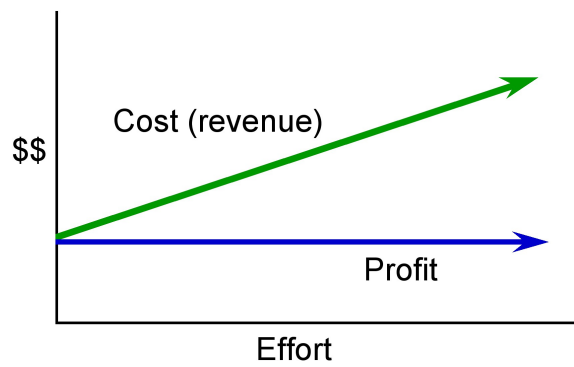
### Contract types

You should know a little bit about the major kinds of contracts available to you so that you choose the one that creates the most fair and workable deal for you and the contractor. Some contracts are *fixed price*: no matter how much time or effort goes into them, you always pay the same (Figure 19). Some are *cost reimbursable* also called *cost plus* (Figure 20). This is where the seller charges you for the cost of doing the work plus some fee or rate. The third major kind of contract is *time and materials* (Figure 21). That's where the buyer pays a rate for the time spent working on the project and also pays for all the materials used to do the work.



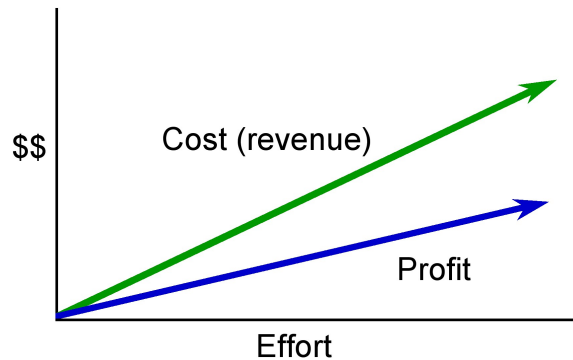
**Figure 19:** A fixed price contract the cost (or revenue to the vendor) is constant regardless of effort applied or delivery date.

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**Figure 20:** In a cost reimbursable or cost plus contract, the seller is guaranteed a specific fee.

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**Figure 21:** In a time and materials contract the cost (or revenue to the vendor) increases with increased effort.

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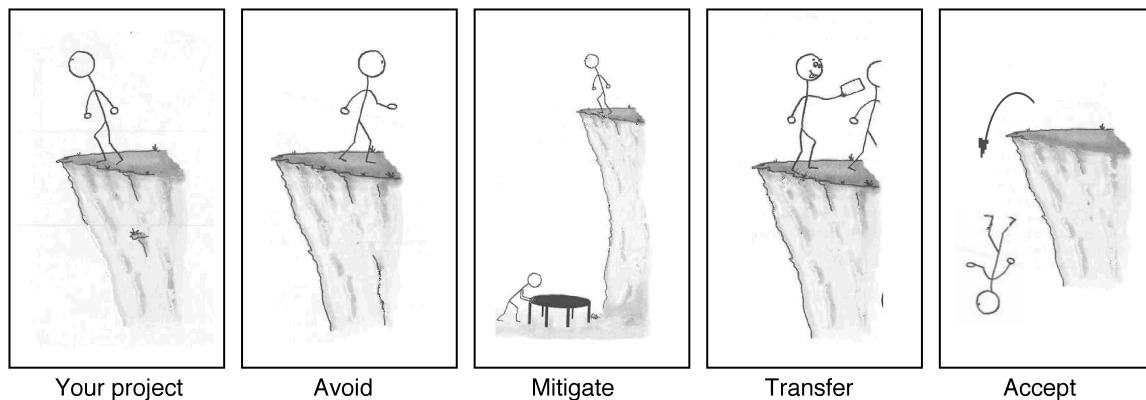
## Risk management planning

Even the most carefully planned project can run into trouble. No matter how well you plan, your project can always run into unexpected problems. Team members get sick or quit, resources that you were depending on turn out to be unavailable, even the weather can throw you for a loop. For example, Hurricane Ike. So does that mean that you're helpless against unknown problems? No! You can use risk planning to identify potential problems that could cause trouble for your project, analyze how likely they'll be to occur, take action to prevent the risks you can avoid, and minimize the ones that you can't.

A risk is any uncertain event or condition that might affect your project. Not all risks are negative. Some events (like finding an easier way to do an activity) or conditions (like lower prices for certain materials) can help your project. When this happens, we call it an opportunity; but it's still handled just like a risk.

There are no guarantees on any project. Even the simplest activity can turn into unexpected problems. Any time there's anything that might occur on your project and change the outcome of a project activity, we call that a risk. A risk can be an event (like a hurricane) or it can be a condition (like an important part being unavailable). Either way, it's something that may or may not happen ...but if it does, then it will force you to change the way you and your team will work on the project.

If your project requires that you stand on the edge of a cliff, then there's a risk that you could fall (Figure 22). If it's very windy out or if the ground is slippery and uneven, then falling is more likely.



**Figure 22:** Potential ways to handle risk in a project.

When you're planning your project, risks are still uncertain: they haven't happened yet. But eventually, some of the risks that you plan do happen. And that's when you have to deal with them. There are four basic ways to handle a risk.

1. **Avoid:** The best thing that you can do with a risk is to avoid it. If you can prevent it from happening, it definitely won't hurt your project. The easiest way to avoid this risk is to walk away from the cliff (Figure 22), but that may not be an option on this project.
2. **Mitigate:** If you can't avoid the risk, you can mitigate it. This means taking some sort of action that will cause it to do as little damage to your project as possible (Figure 22).
3. **Transfer:** One effective way to deal with a risk is to pay someone else to accept it for you (Figure 22). The most common way to do this is to buy insurance.
4. **Accept:** When you can't avoid, mitigate, or transfer a risk, then you have to accept it (Figure 22). But even when you accept a risk, at least you've looked at the alternatives and you know what will happen if it occurs. If you can't avoid the risk, and there's nothing you can do to reduce its impact, then accepting it is your only choice.

By the time a risk actually occurs on your project, it's too late to do anything about it. That's why you need to plan for risks from the beginning and keep coming back to do more planning throughout the project.

The *risk management* plan tells you how you're going to handle risk in your project. It documents how you'll access risk on the project, who is responsible for doing it, and how often you'll do risk planning (since you'll have to meet about risk planning with your team throughout the project.)

The plan has parts that are really useful for managing risks.

- **Risk categories** that you'll use to classify your risks. Some risks are technical, like a component that might turn out to be difficult to use. Others are external, like changes in the market or even problems with the weather.
- **Risk breakdown structure (RBS)** is a great tool for managing your risk categories. It looks like a WBS, except instead of tasks it shows how the risks break down into categories.

It's important to come up with guidelines to help you figure out how big a risk's impact is. The impact tells you how much damage the risk will cause to your project. A lot of projects classify impact on a scale from minimal to severe, or from very low to very high. The plan should also give you a scale to help figure out the probability of the risk. Some risks are very likely; others aren't.

## Quality planning

It's not enough to make sure you get it done on time and under budget. You need to be sure you make the right product to suit your stakeholders' needs. Quality means making sure that you build what you said you would and that you do it as efficiently as you can. That means trying not to make too many mistakes and always keeping your project working toward the goal of creating the right product!

Everybody "knows" what quality is. But the way the word is used in everyday life is a little different than how it is used in project management. Just like the tripe constraint, scope, cost, and schedule- you manage quality on your project by setting goals and taking measurements. That's why you need to understand the quality levels your stakeholders believe are acceptable, and that your projects meet those targets; just like it needs to meet their budget and schedule goals.

- **Customer satisfaction** is about making sure that the people who are paying for the end product are happy with what they get. When the team gathers requirements for the specification, they try to write down all of the things that the customers want in the product so that you know how to make them happy. Some requirements can be left unstated, too. Those are the ones that are implied by the customer's explicit needs. For example: some requirements are just common sense, like a product that people hold can't be made from toxic chemicals that kill you. It might not be stated, but it's definitely a requirement!
- **Fitness to use** is about making sure that the product you build has the best design possible to fit the customer's needs. Which would you choose: a product that's beautifully designed, well constructed, solidly built and all around pleasant to look at but does not do what you need, or a product that does what you want despite being really ugly and hard to use? You'll always choose the product that fits your needs, even if it's seriously limited. That's why it's important that the product both does what it is supposed to do and does it well. For example: you could pound in a nail with a screwdriver, but a hammer is better fit for the job.
- **Conformance to requirements** is the core of both customer satisfaction and fitness to use, and is a measure of how well your product does what you intend. Above all, your product needs to do what you wrote down in your requirements document. Your requirements should take into account what will satisfy your customer and the best design possible for the job. That means conforming to both stated and implied requirements.

In the end, your product's quality is judged by whether you built what you said you would build.

Quality planning focuses on taking all of the information available to you at the beginning of your project and figuring out how you will measure your quality and prevent defects. Your company should have a quality policy that tells how it measures quality across the organization. You should make sure your project follows the company policy and any governmental rules or regulations on how you need to plan quality for your project.

You need to plan out which activities you're going to use to measure the quality of the product of your project. And you need to be sure the activities you plan are going to pay off in the end. So you'll need to think about the cost of all the quality-related activities you want to do. Then you'll need to set some guidelines for what you going to measure against. Finally, you'll need to design the tests you're going to run when the product is ready to be tested.

### Quality planning tools

The following represents the quality planning tools available to the project manager.

- **Cost benefit analysis** is looking at how much your quality activities will cost versus how much you will gain from doing them. The costs are easy to measure; the effort and resources it takes to do them are just like any other task on your schedule. Since quality activities don't actually produce a product, it is harder for people to measure the benefit sometimes. The main benefits are less re-work, higher productivity and efficiency and more satisfaction from both the team and the customer.

- **Benchmarking** means using the results of quality planning on other projects to set goals for your own. You might find that the last project in your company had 20% fewer defects than the one before it. You should want to learn from a project like that and put in practice any of the ideas they used to make such a great improvement. Benchmarks can give you some reference points for judging your own project before you even get started with the work.
- **Design of experiments** is the list of all the kinds of tests you are going to run on your product. It might list all the kinds of test procedures you'll do, the approaches you'll take, and even the tests themselves. (In the software world, this is called test planning).
- **Cost of quality** is what you get when you add up the cost of all the prevention and inspection activities you are going to do on your project. It doesn't just include the testing. It includes any time spent writing standards, reviewing documents, meeting to analyze the root causes of defects, re-work to fix the defects once they're found by the team; absolutely everything you do to ensure quality on the project.

Cost of quality can be a good number to check whether your project is doing well or having trouble. Say your company tracks cost of quality on all of its projects. Then you could tell if you were spending more or less than they are to get your project up to quality standards.

Once you have your quality plan, you know your guidelines for managing quality on your project. Your strategies for monitoring your project quality should be included in the plan, as well as the reasons for all the steps you are taking. It's important that everyone on the team understand the rationale behind the metrics being used to judge success or failure of the project.

## Communication planning

Communications management is about keeping everybody in the loop. Have you ever tried talking to someone in a really loud, crowded room? That's what running a project is like if you don't get a handle on communications. The communications planning process concerns defining the types of information you're going to deliver, to whom, the format for communicating the information and when. It turns out that 90% of a project manager's job is spent on communication so it's important to make sure everybody gets the right message at the right time.

The first step in defining your communication plan is figuring out what kind of communication your stakeholders need from the project so that they can make good decisions. This is called the *communications requirements analysis*. Your project will produce a lot of information; you don't want to overwhelm your stakeholders with all of it. Your job here is to figure out what they feel is valuable. Communicating valuable information doesn't mean you always paint a rosy picture. Communications to stakeholders may consist of either good news or bad news- the point is that you don't want to bury stakeholders in too much information but give them enough so that they're informed and can make appropriate decisions.

*Communications technology* has a major impact on how you can keep people in the loop. This examines the methods (or technology) used to communicate the information to, from and among the stakeholders. Methods of communicating can take many forms, such as written, spoken, e-mail, formal status reports, meetings, online databases, online schedules, project websites and so forth. You should consider several factors before deciding what methods you'll choose to transfer information. The timing of the information exchange or need for updates is the first factor. It's a lot easier for people to get information on their projects if it's accessible through a web site, than if all your information is passed around by paper memos. Do you need to procure new technology or systems, or are there systems already in place that will work? The technologies available to you will definitely figure into your plan of how you will keep everyone notified of project status and issues. Staff experience with the technology is another factor. Are there project team members and stakeholders experienced at using this technology, or will you need to train them? Finally, consider the duration of the project and the project environment. Will the technology you're choosing work throughout the life of the project or will it have to be upgraded or updated at some point? And how does the project team function? Are they located together or spread out across several campuses or locations?

The answers to these questions should be documented in the communication plan.

All projects require sound communication plans, but not all projects will have the same types of communication or the same methods for distributing the information. The communication plan documents the types of information needs the stakeholders have, when the information should be distributed and how the information will be delivered.

The type of information you will typically communicate includes project status, project scope statements, and scope statement updates, project baseline information, risks, action items, performance measures, project acceptance and so on. What's important to know now is that the information needs of the stakeholders should be determined as early in the planning phase of the project management lifecycle as possible so that as you and your team develop project planning documents, you already know who should receive copies of them and how they should be delivered.

## Bringing it all together

Believe it or not, we have officially completed the *planning phase* of the project management lifecycle. The project plan is the approved, formal, documented plan that's used to guide you throughout the project *execution phase*. The plan is made up of all the processes of the planning phase. It is the map that tells you where you're going and how to perform the activities of the project plan during the project execution phase. It serves several purposes; the most important of which is tracking and measuring project performance. The project plan is critical in all communications you'll have from here forward with the stakeholders, management, and customers. The project plan encompasses everything we talked about up to now and is represented in a formal document or collection of documents. This document contains the project scope, deliverables, assumptions, risks, WBS, milestones, project schedule, resources, communication plan, the project budget and any procurement needs. It becomes the baseline you'll use to measure and track progress against. It is also used to help you control the components that tend to stray away from the original plan so you can get them back on track.

The project plan is used as a communication and information tool for stakeholders, team members and the management team. They will use the project plan to review and gauge progress as well. Your last step in the planning phase is obtaining sign-off of the project plan from stakeholders, the sponsor and the management team. If they've been an integral part of the planning processes all along (and I know you know how important this is), obtaining sign-off of the project plan should simply be a formality.

## Bibliography

- J. Green and A. Stellman, *Head First PMP*, O'Reilly Media, CA (2007).



# Project Execution<sup>13</sup>

After you have carefully planned your project, you will be ready to start the project execution phase, the third phase of the project management *life cycle*. The execution phase involves putting the project plan into action. It's here that the project manager will coordinate and direct project resources to meet the objectives of the project plan. As the project unfolds, it's the project manager's job to direct and manage each activity on the project, every step of the way. That's what happens in the *execution phase* of the project lifecycle; you simply follow the plan you've put together and handle any problems that come up.

The execution phase is where you and your project team actually do the project work to produce the deliverables. The word deliverable means anything your project delivers. The deliverables for your project include all of the products or services that you and your team are performing for the client, customer or sponsor including all the project management documents that you put together.

The steps undertaken to build each deliverable will vary depending on the type of project you are undertaking, and cannot therefore be described here in any real detail. For instance engineering and telecommunications projects will focus on using equipment, resources and materials to construct each project deliverable, whereas computer software projects may require the development and implementation of software code routines to produce each project deliverable. The activities required to build each deliverable will be clearly specified within the project requirements document and project plan accordingly.

Your job as project manager is to direct the work, but you need to do more than deliver the results. You also need to keep track of how well your team performed. The executing phase keeps the project plan on track with careful monitoring and control processes to ensure the final deliverable meets the acceptance criteria set by the customer. This phase is typically where approved changes are implemented.

Most often changes are identified through looking at performance and quality control data. Routine performance and quality control measurements should be evaluated on a regular basis throughout the execution phase. Gathering reports on those measurements will help you determine where the problem is and recommend changes to fix it.

## Change control

When you find a problem, you can't just make a change, because what if it's too expensive, or will it take too long? You will need to look at how it affects the triple constraint (*time, cost, scope*) and how they impact quality. You will then have to figure out if it is worth making the change. Change control is a set of procedures that let you make changes in an organized way.

Anytime you need to make a change to your plan, you need to start with a *change request* (Figure 1). This is a document that either you or the person making the request needs to create. Any change to your project needs to be documented so you can figure out what needs to be done, by when, and by whom.

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<sup>13</sup>This content is available online at <<http://cnx.org/content/m32189/1.1/>>.



**Figure 1:** Is it too late to add the client's wish list of features to the project?

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Once the change request is documented, it is submitted to a *change control board*. A change control board is a group of people who consider changes for approval. Not every change control system has a board but most do. The change request could also be submitted to the project sponsor or management for review and approval. Putting the recommended changes through change control will help you evaluate the impact and update all the necessary documents. Not all changes are approved, but if the changes and repairs are approved, you send them back to the team to put them in place.

The execution phase will utilize the most project time and resources and as a result, costs are usually the highest during the executing phase. Project managers will also experience the greatest conflicts over schedules in this phase. You may find as your monitoring your project, the actual time it is taking to do the scheduled work is taking longer than the amount of time you planned. If you evaluate the impact of the change and find that it won't have an impact on the project triple constraint, then you can make the change without going through change control.

When you absolutely have to meet the date and you are running behind, you can sometimes find ways to do activities more quickly by adding more resources to critical path tasks. That's called *crashing*. Crashing the schedule means adding resources or moving them around to shorten it. Crashing ALWAYS costs more and doesn't always work! There's no way to crash a schedule without raising the overall cost of the project. So, if the budget is fixed and you don't have any extra money to spend, you can't use this technique.

Sometimes you've got two activities planned to occur in sequence, but you can actually do them at the same time. This is called *fast-tracking* the project. On a software project, you might do both your *user acceptance testing* (UAT) and your functional testing at the same time, for example. This is pretty risky. There's a good chance you might need to redo some of the work you have done concurrently. Crashing and fast tracking are schedule compression tools. Managing schedule change means keeping all of your schedule documents up to date. That way, you will always be comparing your results to the right plan.

After the deliverables have been physically constructed and accepted by the customer a phase review is carried out to determine whether the project is complete and ready for closure.

# Project Closeout<sup>14</sup>

Every project needs to end and that's what project closeout is all about in the last phase of the *project lifecycle*. The whole point of the project is that you need to deliver what you promised. By making sure you delivered everything you said you would, you make sure that all stakeholders are satisfied and all acceptance criteria has been met. Once that happens, your project can finish (Figure 1).



**Figure 1:** The potential unwanted consequences of finishing a project on time and within budget!

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Project *closeout* is often the most often neglected phase of all the project lifecycle. Once the project is over, it's easy to pack things up, throw some files in a drawer, and start moving right into the initiation phase of the next project. Hold on! You're not done yet!

The key activity in project closeout is gathering project records and disseminating information to formalize acceptance of the product, service or project as well as to perform project closure. As the project manager, you will want to review project documents to make certain they are up-to-date. For example, perhaps some scope change requests were implemented that changed some of the characteristics of the final product. The project information you are collecting during this phase should reflect the characteristics and specifications of the final product. Don't forget to update your resource assignments as well. Some team members will have come and gone over the course of the project; you need to double-check that all the resources and their roles and responsibilities are noted.

Once the project outcomes are documented, you'll request formal acceptance from the stakeholders or customer. They're interested in knowing if the product or service of the project meets the objectives the

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<sup>14</sup>This content is available online at <<http://cnx.org/content/m32188/1.1/>>.

project set out to accomplish. If your documentation is up-to-date, you'll have the project results at hand to share with them.

## Lessons learned

Project closeout is also concerned with analyzing the project management processes to determine their effectiveness and to document *lessons learned*. Lessons learned are used to document the successes and failures of the project. As an example, lessons learned document the reasons why specific corrective actions were taken, their outcomes, the causes of performance variances, unplanned risks that occurred, mistakes that were made and could have been avoided and so on.

Unfortunately, sometimes projects do fail. There are things that can be learned from the failure of a project (as well from successful projects), and this information should be documented for future reference. Lessons learned can be some of the most valuable information you'll take away from any project. We can all learn from our experiences, and what better way to have more success on your next project than to review a similar past project's lessons learned document? But it is important not to forget the lessons learned!

## Contract closure

Contracts come to a close just as projects come to a close. *Contract closure* is concerned with completing and settling the terms of the contract. It supports the project closeout process because the contract closure process determines if the work described in the contract was completed accurately and satisfactorily. Keep in mind that not all projects are performed under contract so not all projects require the contract closure process. Obviously, this process applies only to those phases, deliverables or portions of the project that were performed under contract.

Contract closure updates the project records detailing the final results of the work on the project. Contracts may have specific terms or conditions for completion and closeout. You should be aware of these terms or conditions so that project closeout isn't held up because you missed an important detail. If you are administering the contract yourself, be sure to ask your procurement department if there are any special conditions that you should be aware of so that your project team doesn't inadvertently delay contract project closure.

One of the purposes of contract closure process is to provide formal notice to the seller- usually in written form, that the deliverables are acceptable and satisfactory or have been rejected. If the product or service does not meet the expectations, the vendor will need to correct the problems before you issue a formal acceptance notice. Hopefully, quality audits have been performed during the course of the project and the vendor was given the opportunity to make corrections earlier in the process than the closing phase. It's not a good idea to wait until the very end of the project and then spring all the problems and issues on the vendor at once. It's much more efficient to discuss problems with your vendor as the project progresses because it provides the opportunity for correction when the problems occur.

If the product or service does meet the project's expectation and is acceptable, formal written notice to the seller is required indicating that the contract is complete. This is the formal acceptance and closure of the contract. It's your responsibility as the project manager to document the formal acceptance of the contract. Many times the provisions for formalizing acceptance and closing the contract are spelled out in the contract itself.

If you have a procurement department handling the contract administration, they will expect you to inform them when the contract is complete and will in turn follow the formal procedures to let the seller know the contract is complete. However, you'll still note the contract completion in your copy of the project records.

## Releasing project team

Releasing project team members is not an official process. However, it should be noted that at the conclusion of the project, you will release your project team members, and they will go back to their functional managers or get assigned to a new project. You will want to keep their managers, or other project managers, informed as you get closer to project completion, so that they have time to adequately plan for the return of their employees. Start letting them know a few months ahead of time what the schedule looks like and how soon they can plan on using their employees on new projects. This gives the other managers the ability to start planning activities and scheduling activity dates.

## Celebrate!

The project team should celebrate their accomplishment, and the project manager should officially recognize their efforts and thank them for their participation and officially close the project. A celebration helps team members formally recognize the project end and brings closure to the work they've done. It also encourages them to remember what they've learned and to start thinking about how their experiences will benefit them and the organization during the next project (Figure 2).



**Figure 2:** Celebrate! Your project is over... at least until the next one.

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# A Glossary of Project Management Terms<sup>15</sup>

Every discipline has its own vocabulary, and project management is no exception. Part of the process of successfully deploying project management in your organization is to standardize the terminology. That way, when one person talks about risks, scope, issues, requirements, and other project management concerns, everyone else knows what he or she is referring to. This glossary contains common terms used in project management and can help start the standardization process.

## Assumption

There may be external circumstances or events that must occur for the project to be successful (or that should happen to increase your chances of success). If you believe that the probability of the event occurring is acceptable, you could list it as an assumption. An assumption has a probability between 0 and 100%. That is, it is not impossible that the event will occur (0%) and it is not a fact (100%). It is somewhere in between. Assumptions are important because they set the context in which the entire remainder of the project is defined. If an assumption doesn't come through, the estimate and the rest of the project definition may no longer be valid.

## BAC

Budget at completion (BAC) is the sum of all budgets allocated to a project.

## Backward pass

Calculation of the latest finish times by working from finish-to-start for the uncompleted portion of a network of activities.

## Balanced matrix

An organizational matrix where functions and projects have the same priority.

## Bar chart

A view of the project schedule that uses horizontal bars on a time scale to depict activity information; frequently called a Gantt chart.

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<sup>15</sup>This content is available online at <<http://cnx.org/content/m31434/1.6/>>.

## **Baseline**

The value or condition against which all future measurements will be compared.

## **Baseline cost**

The amount of money an activity was intended to cost when the baseline plan was established.

## **Baseline dates**

Original planned start and finished dates for an activity. Used to compare with current planned dates to determine any delays. Also used to calculate budgeted cost of work scheduled in earned value analysis.

## **Baseline plan**

The original plan (for a project, a work package, or an activity), plus or minus approved changes. Usually used with a modifier, e.g., cost baseline, schedule baseline, performance measurement baseline, etc.

## **Best practices**

Techniques that agencies may use to help detect problems in the acquisition, management, and administration of service contracts. Best practices are practical techniques gained from experience that have been shown to produce best results.

## **Beta testing**

Pre-release testing in which a sampling of the intended customer base tries out the product.

## **Bottom-up cost estimate**

The approach to making a cost estimate or plan in which detailed estimates are made for every task shown in the work breakdown structure and then summed to provide a total cost estimate or plan for the project.

## **Brainstorming**

The unstructured and dynamic generation of ideas by a group of people where anything and everything is acceptable, particularly useful in generating a list of potential project risks.

## **Budget**

Generally refers to a list of all planned expenses and revenues.

## **Budgeted cost of work performed (BCWP)**

Measures the budgeted cost of work that has actually been performed, rather than the cost of work scheduled.



## **Budgeted cost of work scheduled (BCWS)**

The approved budget that has been allocated to complete a scheduled task, or work breakdown structure (WBS) component, during a specific time period.

## **Business analysis**

Is the set of tasks, knowledge, and techniques required to identify business needs and determine solutions to business problems. Solutions often include a systems development component, but may also consist of process improvement or organizational change.

## **Business area**

The part of the organization containing the business operations affected by a program or project.

## **Business case**

A document developed towards the end of the concept phase, to establish the merits and desirability of the project and justification for further project definition.

## **Business needs**

The requirements of an enterprise to meet its goals and objectives.

## **Business operations**

The ongoing recurring activities involved in the running of a business for the purpose of producing value for the stakeholders. They are contrasted with project management, and consist of business processes.

## **Business process**

A collection of related, structured activities or tasks that produce a specific service or product (serve a particular goal) for a particular customer or customers. There are three types of business processes: management processes, operational processes, and supporting processes.

## **Case study**

A research method which involves an in-depth, longitudinal examination of a single instance or event: a case. They provide a systematic way of looking at events, collecting data, analyzing information, and reporting the results.

## **Champion**

An end user representative, often seconded into a project team. Someone who acts as an advocate for a proposal or project.

## Change control

A general term describing the procedures used to ensure that changes (normally, but not necessarily, to IT systems) are introduced in a controlled and coordinated manner. Change control is a major aspect of the broader discipline of change management.

## Change management

The formal process through which changes to the project plan are approved and introduced.

## Change order

A document that authorizes a change in some aspect of the project.

## Change request

A request needed to obtain formal approval for changes to the scope, design, methods, costs, or planned aspects of a project. Change requests may arise through changes in the business or issues in the project. Change requests should be logged, assessed and agreed on before a change to the project can be made.

## Child activity

Subordinate task belonging to a *parent* task existing at a higher level in the work breakdown structure.

## Client/customers

The person or group that is the direct beneficiary of a project or service is the client/customer. These are the people for whom the project is being undertaken (indirect beneficiaries are stakeholders). In many organizations, internal beneficiaries are called *clients* and external beneficiaries are called *customers*, but this is not a hard and fast rule.

## Constraints

Constraints are limitations that are outside the control of the project team and need to be managed around. They are not necessarily problems. However, the project manager should be aware of constraints because they represent 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.

## Critical path

The critical path is the sequence of activities that must be completed on schedule for the entire project to be completed on schedule. It is the longest duration path through the workplan. If an activity on the critical path is delayed by one day, the entire project will be delayed by one day (unless another activity on the critical path can be accelerated by one day).

## **Closeout**

The completion of all work on a project.

## **Communication plan**

A statement of project's stakeholders' communication and information needs.

## **Concept phase**

The first phase of a project in the generic project lifecycle, in which the need is examined, alternatives are assessed, the goals and objectives of the project are established and a sponsor is identified.

## **Confidence level**

A level of confidence, stated as a percentage, for a budget or schedule estimate. The higher the confidence level, the lower the risk.

## **Conflict management**

Handling of conflicts between project participants or groups in order to create optimal project results.

## **Conflict resolution**

To seek a solution to a problem, five methods in particular have been proven through confrontations, compromise, smoothing, forcing and withdrawal.

## **Constraints**

Constraints are limitations that are outside the control of the project team and need to be managed around. They are not necessarily problems. However, the project manager should be aware of constraints because they represent 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.

## **Contingencies**

A Contingency is the planned allotment of time and cost for unforeseeable elements with a project. Including contingencies will increase the confidence of the overall project.

## **Control**

The process of comparing actual performance with planned performance, analyzing the differences, and taking the appropriate corrective action.

## **Costs**

The cost value of project activity.

## **Costs budgeting**

The allocation of cost estimates to individual project components.

## **Cost overrun**

The amount by which actual costs exceed the baseline or approved costs.

## **Crashing**

The process of reducing the time it takes to complete an activity by adding resources.

## **Critical**

An activity or event that, if delayed, will delay some other important event, commonly the completion of a project or a major milestone in a project.

## **Critical path method (CPM)**

A mathematically based modeling technique for scheduling a set of project activities, used in project management.

## **Critical chain project management (CCPM)**

A method of planning and managing projects that puts more emphasis on the resources required to execute project tasks.

## **Critical success factors**

The key factors that are deemed critical to the success of the project. The nature of these factors will govern the response to conflicts, risks and the setting of priorities.

## **Culture**

A person's attitudes arising out of their professional, religious, class, educational, gender, age and other backgrounds.

## **Customer**

See client.

## **Deliverable**

A deliverable is any tangible outcome that is produced by the project. All projects create deliverables. These can be documents, plans, computer systems, buildings, aircraft, etc. Internal deliverables are produced as a consequence of executing the project and are usually needed only by the project team. External deliverables are those that are created for clients and stakeholders. Your project may create one or many deliverables.

## **Dependency**

Dependencies on a project are the relationships between activities whereby one activity must do something (finish-to-start) before another activity can do something (start-to-finish).

## **Duration**

The duration of a project's terminal element is the number of calendar periods it takes from the time the execution of element starts to the moment it is completed.

## **Earned value management (EVM)**

A project management technique for measuring project progress in an objective manner, with a combination of measuring scope, schedule, and cost in a single integrated system.

## **Earned schedule (ES)**

An extension to earned value management (EVM), which renames two traditional measures, to indicate clearly they are in units of currency or quantity, not time.

## **Estimation**

In project management it is the processes of making accurate estimates using the appropriate techniques.

## **Event chain diagram**

A diagram that show the relationships between events and tasks and how the events affect each other.

## **Event chain methodology**

An uncertainty modeling and schedule network analysis technique that is focused on identifying and managing events and event chains that affect project schedules.

## **Float**

In a project network is the amount of time that a task in a project network can be delayed without causing a delay to subsequent tasks and or the project completion date.

## Functional manager

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

## Gantt, Henry

An American mechanical engineer and management consultant, who developed the Gantt chart in the 1910s.

## 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.

## Goal

An objective that consists of a projected state of affairs which a person or a system plans or intends to achieve or bring about a personal or organizational desired end-point in some sort of assumed development. Many people endeavor to reach goals within a finite time by setting deadlines.

## Goal setting

Involves establishing specific, measurable and time targeted objectives.

## Graphical evaluation and review technique (GERT)

A network analysis technique that allows probabilistic treatment of both network logic and activity duration estimated.

## Hammock activity

A schedule (project management) or project planning term for a grouping of subtasks that *hangs* between two end dates it is tied to. or the two end events it is fixed to.

## ISO 10006

A guideline for quality management in projects, is an international standard developed by the International Organization for Standardization.

## Issue

An issue is a major problem that will impede the progress of the project and that can't be resolved by the project manager and project team without outside help. Project managers should proactively deal with issues through a defined issues management process.

## Kickoff meeting

The first meeting with the project team and the client of the project.

## Level of effort (LOE)

Is qualified as a support type activity which doesn't lend itself to measurement of a discrete accomplishment. Examples of such an activity may be project budget accounting, customer liaison, etc.

## Life cycle

Life cycle refers to the process used to build the deliverables produced by the project. Every project has an inception, a period during which activities move the project toward completion, and a termination (either successful or unsuccessful). Taken together, these phases represent the path a project takes from the beginning to its end and are generally referred to as the project life cycle. The project life cycle is often formally divided into phases that describe common activities as the project matures.

## Management

In business and human organization activity is simply the act of getting people together to accomplish desired goals. Management comprises planning, organizing, staffing, leading or directing, and controlling an organization (a group of one or more people or entities) or effort for the purpose of accomplishing a goal.

## Management process

A process of planning and controlling the performance or execution of any type of activity.

## Motivation

Is the set of reasons that determines one to engage in a particular behavior.

## Milestone

A milestone is a scheduling event that signifies the completion of a major deliverable or a set of related 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 work plan to signify that some other work has completed. Usually, a milestone is used as a project checkpoint to validate how the project is progressing. In many cases there is a decision, such as validating that the project is ready to proceed further, that needs to be made at a milestone.

## Objective

An objective is a concrete statement that describes what the project is trying to achieve. The objective should be written at a low level, so that it can be evaluated at the conclusion of a project to see whether it was achieved. Project success is determined based on whether the project objectives were achieved. A technique for writing an objective is to make sure it is *specific, measurable, acceptable, realistic, and time based* (SMART).

## **Operations management**

An area of business that is concerned with the production of good quality goods and services, and involves the responsibility of ensuring that business operations are efficient and effective. It is the management of resources, the distribution of goods and services to customers, and the analysis of queue systems.

## **Organization**

A social arrangement which pursues collective goals, which controls its own performance, and which has a boundary separating it from its environment.

## **Planning**

Planning in project management consists of processes that involve formulating and revising project goals and objectives and creating the project management plan that will be used to achieve the goals the project was undertaken to address. Planning involves determining alternative courses of action and selecting from among the best of those to produce the project's goals.

## **Process**

An ongoing collection of activities, with an inputs, outputs and the energy required to transform inputs to outputs.

## **Program**

A program is the umbrella structure established to manage a series of related projects. The program does not produce any project deliverables. The project teams produce them all. The purpose of the program is to provide overall direction and guidance, to make sure the related projects are communicating effectively, to provide a central point of contact and focus for the client and the project teams, and to determine how individual projects should be defined to ensure that all the work gets completed successfully.

## **Program management**

The process of managing multiple ongoing inter-dependent projects. An example would be that of designing, manufacturing and providing support infrastructure for an automobile manufacturer.

## **Program manager**

A program manager is the person with the authority to manage a program. (Note that this is a role. 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.

## **Project**

A project is a temporary endeavor undertaken to accomplish a unique product or service with a defined start and end point and specific objectives that, when attained, signify completion.



## **Project definition (project charter)**

Before you start a project, it is important to know the overall objectives of the project, as well as the scope, deliverables, risks, assumptions, project organization chart, etc. The project definition (or project charter) is the document that holds this relevant information. The project manager is responsible for creating the project definition. The document should be approved by the sponsor to signify that the project manager and the sponsor are in agreement on these important aspects of the project.

## **Project manager**

The project manager is the person with the authority to manage a project. The project manager is 100 percent responsible for the processes used to manage the project. He or she also has people management responsibilities for team members, although this is shared with the team member's functional manager. The processes used to manage the project include defining the work, building the work plan and budget, managing the work plan and budget, scope management, issues management, risk management, etc.

## **Project management**

Project management is the application of knowledge, skills, tools, and techniques applied to project activities in order to meet or exceed stakeholder needs and expectations from a project.

## **Project management body of knowledge (PMBOK)**

The sum of knowledge within the profession of project management that is standardized by ISO.

## **Project management professional**

A certificated professional in project management.

## **Project management software**

A type of software, including scheduling, cost control and budget management, resource allocation, collaboration software, communication, quality management and documentation or administration systems, which are used to deal with the complexity of large projects.

## **Project phase**

A phase is a major logical grouping of work on a project. It 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 plan**

A formal, approved document used to guide both project execution and project control. The primary uses of the project plan are to document planning assumptions and decisions, facilitate communication among stakeholders, and document approved scope, cost, and schedule baselines. A project plan may be summary or detailed.

## **Project planning**

A part of project management, which relates to the use of schedules such as Gantt charts to plan and subsequently report progress within the project environment.

## **Project team**

The project team consists of the full-time and part-time resources assigned to work on the deliverables of the project. They are responsible for understanding the work to be completed; completing assigned work within the budget, timeline, and quality expectations; informing the project manager of issues, scope changes, and risk and quality concerns; and proactively communicating status and managing expectations.

## **Quality**

The standards and criteria to which the project's products must be delivered for them to perform effectively. First, the product must perform to provide the functionality expected, and to solve the problem, and deliver the benefit and value expected of it. It must also meet other performance requirements, or service levels, such as availability, reliability and maintainability, and have acceptable finish and polish. Quality on a project is controlled through quality assurance (QA) which is the process of evaluating overall project's performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.

## **Requirements**

Requirements are descriptions of how a product or service should act, appear, or perform. Requirements generally refer to the features and functions of the deliverables you are building on your project. Requirements are considered to be a part of project scope. High-level scope is defined in your project definition (charter). The requirements form the detailed scope. After your requirements are approved, they can be changed through the scope change management process.

## **Resources**

Resources are the people, equipment, and materials needed to complete the work of the project.

## **Risk**

There may be potential external events that will have a negative impact on your project if they occur. Risk refers to the combination of the probability the event will occur and the impact on the project if the event occurs. If the combination of the probability of the occurrence and the impact to the project is too high, you should identify the potential event as a risk and put a proactive plan in place to manage the risk.

## **Risk management planning**

The process that determines how risks will be managed for a project. It describes how risks are defined, monitored, and controlled throughout the project.

## Schedule development

This process calculates and prepares the schedule of project activities, which becomes the schedule baseline. It determines activity start and finish dates, finalizes activity sequences and durations, and assigns resources to activities.

## Scope

Scope is the way you describe the boundaries of the project. It defines what the project will deliver and what it will not deliver. High-level scope is set in your project definition (charter) and includes all of your deliverables and the boundaries of your project. The detailed scope is identified through your business requirements. Any changes to your project deliverables, boundaries, or requirements would require approval through scope change management.

## Scope creep

Refers to uncontrolled changes in a project's scope. This phenomenon can occur when the scope of a project is not properly defined, documented, or controlled. It is generally considered a negative occurrence that is to be avoided.

## Six sigma

A business management strategy, originally developed by Motorola, that today enjoys widespread application in many sectors of industry.

## Sponsor (executive sponsor and project sponsor)

The sponsor is the person who has ultimate authority over the 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 the 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.

## Stakeholder

Specific people or groups who have a stake in the outcome of the project are stakeholders. Normally stakeholders are from within the company and may include internal clients, management, employees, administrators, etc. A project can also have external stakeholders, including suppliers, investors, community groups, and government organizations.

## Steering committee

A steering committee is usually a group of high-level stakeholders who are responsible for providing guidance on overall strategic direction. They don't take the place of a sponsor but help spread the strategic input and buy-in to a larger portion of the organization. The steering committee is especially valuable if your project

has an impact in multiple organizations because it allows input from those organizations into decisions that affect them.

## **Systems development lifecycle (SDLC)**

Is any logical process used by a systems analyst to develop an information system, including requirements, validation, training, and user ownership. An SDLC should result in a high quality system that meets or exceeds customer expectations, within time and cost estimates, works effectively and efficiently in the current and planned information technology (IT) infrastructure, and is cheap to maintain and cost-effective to enhance.

## **Tasks**

In project management a task is an activity that needs to be accomplished within a defined period of time.

## **Task analysis**

The analysis or a breakdown of exactly how a task is accomplished, such as what sub-tasks are required.

## **Timeline**

A graphical representation of a chronological sequence of events also referred to as a chronology. It can also mean a schedule of activities, such as a timetable.

## **Triple constraint**

Triple constraint is called the scope triangle or the quality triangle. The triangle illustrates the relationship between three primary forces in a project. Project scope, time and cost—Project quality is affected by balancing these three factors.

## **Work**

In project management is the amount of effort applied to produce a deliverable or to accomplish a task (a terminal element).

## **Work breakdown structure (WBS)**

A task oriented family tree of activities which organizes, defines and graphically displays the total work to be accomplished in order to achieve the final objectives of a project. It is a system for sub-dividing a project into manageable work packages.

## **Work package**

A deliverable at the lowest level of a work breakdown structure (WBS). They are a group of related tasks that are defined at the same level within the WBS.

## **Work plan (schedule)**

The project work plan tells you how you will complete the project. It describes the activities required, the sequence of the work, who is assigned to the work, an estimate of how much effort is required, when the work is due, and other information of interest to the project manager. The work plan allows the project manager to identify the work required to complete the project and also allows the project manager to monitor the work to determine whether the project is on schedule.



# Chapter 1

## Project Communication Management

### 1.1 How to Conduct a Meeting in an Intercultural Setting<sup>1</sup>

**Contents:** Reading • Assignments • Student Engineers' Commentaries

NOTE: Several students contributed to the readings in the module. Their names are listed by their commentaries. The preparation of this module and others in the “Preparing for Engineering Communication in Developing COuntries” was supported by a generous grant from the Engineering Information Foundation. We are grateful for their belief that today’s engineering students need information that will prepare them to deal with international collaborations.

#### 1.1.1 MODULE READING

##### 1.1.1.1 Conducting Meetings in Intercultural Settings

As demonstrated in the module, **How to Detect Cultural Differences**, surface differences in cultures usually reflect differences in the deep structure of cultures. Meetings exhibit these same differences as well. In addition to the explicit differences in the surface features of meetings, you should also learn a basic negotiation process that the Harvard Negotiation Project has taught for many years and used as a model for analyzing international as well as interpersonal negotiations. It involves four basic steps that are fairly easy to grasp and that you can apply to many intercultural situations.

NOTE: The book that most concisely explains this process is **GETTING TO YES! Negotiating Agreement without Giving In**, which you can buy at most bookstores for under \$15. The title could easily be reworded as **GETTING TO YES! Negotiating Agreement While Creating Mutual Benefits** because it is NOT about overcoming opposition. It is about discovering solutions that will satisfy parties with different desires.

The Harvard Process breaks down into four steps:

1. Finding out people’s reasons or interests (also called separating people from positions)
2. Inventing options for mutual gains
3. Choosing objective criteria
4. Reaching agreement

There are good reasons for using this four-step process. By seeking to understand people’s motivations and working out a set of objective criteria, you have a better chance of discovering the underlying or deep

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<sup>1</sup>This content is available online at <<http://cnx.org/content/m14681/1.3/>>.

cultural values may very much affect the long-term success of any agreement or discussion. Some differences in cultural values can affect the process, such as whether “truth” depends on empirical verification or on faith/desire/received belief. However, patient and calm use of this method seems to have several advantages.

### 1.1.1.2 1. Finding out people’s reasons or interests

Very often, our usual friends think they know what they want: to pay \$5000 for a used car, to have the family at home for Christmas dinner, or to be sent on a two[U+2011]year project in Mexico. If those wishes can’t be fulfilled immediately, people need to negotiate. To avoid settling, for a compromise that satisfies no one, people need to find out what motivates the other negotiator’s requests. You have to “separate” people from their declared objective and find out why that objective matters to them. You have to say things like:

"How will this benefit you?"

"Why did you want to do this?"

"Have you seen this work well for some other person / organization / firm?"

"How do you believe this would work out better than what we did last time?"

"Could you let me know more about how this fits with your goals?"

Try to memorize or "burn these into your neural pathways" so that it will be easy to put forward a helpful question. All of these questions are intended to find out what needs must be satisfied for the other negotiator to reach "YES." At the same time, you want to make clear your own interests in the situation. What benefits are you seeking? What reasons do you have for negotiating? Be careful how you go about reaching, "Yes," because often the method of negotiation is s important to success.

In intercultural negotiation, some participants may not want to reveal their motives to you. Your two most valuable tools for making sure you understand them are **paraphrase** and **indirect narratives**. Paraphrase is restating your understanding in other terms. If they are reluctant to explain their reasons, just invite the other party to correct you where you’re wrong, and summarize what you think are their reasons. In general, people are quite happy to tell you where you’re wrong and will jump back into the process to correct you, although if you have a great deal more power than they do, they may follow a cultural prescription that says, “Tell the boss YES, the boss is always right.” In general, if you emphasize your desire to understand the other person’s language correctly, you may be able to overcome this rule because positioning yourself as the willing learner makes it more likely that the other person will take the position of the one “more knowledgeable about the language.”

Do not agree to anything at this first stage. If you’re asked to agree or promise, you must say, “I understand what you said. I can’t agree at this stage in the meeting. I have to understand what is important about this project/idea/object before we talk about whether it is the best possibility.”

### 1.1.1.3 2. Inventing options for mutual gains

Once you have a clear sense of the other person’s or the community’s reasons for taking a position (making a request), you should begin a separate phase of the discussion. By that I mean that you should specifically say that the exploration of reasons is closed and that you aren’t yet choosing a result.

You want to make clear that you want the other party to help you invent options that will benefit you both. For example, projects must satisfy community needs, but they must also be ones that the team has the knowledge and funds to carry out. Try to come up with new ways of meeting as many needs or interests as you can. Think "outside the box." For example, in everyday life in the US, changing the timing or the financing may enable the buyer to agree to a higher price if keeping the monthly payments down is a key concern. In a project, you may be able to undertake a larger project that the village wants if you can do it in stages or if they can contribute more labor or resources.

In engineering projects, there may be a very good reason to have separate meetings for understanding needs or reasons and for imagining solutions because the engineering team can reasonably say that its members need to do some preliminary work before they can discuss a range of ideas. The team needs time to analyze and be creative. It may need to learn more about local materials, supplies, or conditions before more can be negotiated.



**YOU MUST NOT RESPOND NEGATIVELY TO POSSIBILITIES.** Criticism of an option during this phase will bring the negotiation to a halt, fast. Nothing kills creativity faster than comments such as, “We already tried that and it didn’t work.” “Do you think we’re made of money?” or “That’s not what we came here for.” Instead, try to acknowledge that you’ve heard each possibility by restating it, sometimes separating it from any commitment: “I can see that as an option, but I don’t want to commit to it until after we’ve fully explored the possibilities.”

#### 1.1.1.4 3. Choosing objective criteria

No one wants to live with an unjust agreement. A bargain that is too harsh is one participants can’t live with, and it may come unraveled. Insist on objective criteria. Such criteria might be

- the project fits in with the community’s cultural practices,
- the project could be accomplished with the local equipment available and with the funds the students had raised,
- the project could meet safety standards, professional standards, and legal requirements, or
- the project would provide equal benefits for all parties.

Engineers without Borders only works on projects that benefit the community as a whole, so that would certainly be a major criterion.

If someone insists on an unreasonable criterion, then be prepared to go with your BATNA (best alternative to a negotiated agreement) instead of the agreement. Thinking about your best alternatives in advance will help you be more comfortable if the deal falls through. For example, knowing how much it will cost you to ship your equipment back to the States will help you figure out whether selling your equipment when you leave at a low price or giving it to another non-government agency is your best alternative.

#### 1.1.1.5 4. Reaching agreement

Once you have chosen criteria, apply them to your options. At this point it is easier for all parties to rank the possibilities and perhaps to combine features to reach an optimal deal. At this time it is also a good idea to plan how you will deal with any problems that may come up later. Different cultures tend to have different ideas about how binding contracts are. The Japanese are reputed to believe contracts can always be renegotiated; US companies tend to believe a contract’s provisions must be enforced. Deciding to go with negotiation, mediation, or binding arbitration may lower a company’s legal bills later.

##### **What if they don’t “play fair” by US cultural standards?**

Many popular US negotiation tactics emphasize power gains and hard bargaining. What if the other side huffs and puffs and makes demands or threats? In intercultural collaborative projects, US personnel may be seen as rich imperialists. Villagers may resent having to do what student engineers propose and may attempt to pressure teams to agree to large-scale projects that the student teams do not have funds to complete. Demands may seem only just to the villagers when the differences in wealth and educational opportunities are so great. What if they plead or play upon your status as a wealthy foreign engineer to pressure you to agree without going through the four stages of the process we’ve described?

If you know your BATNA (best alternative to a negotiated agreement), you can make more objective judgments. Don’t agree to rules you can’t live with. Suppose that other side refuses to separate themselves from their position, saying, to put it in a US idiom, “Take it or leave it!” You can respond by playing out the right process verbally in their presence and inviting them to participate.

- “OK, Señor Martinez, I heard you say that the regional coordinator promised you we would do this very large project and that you can’t accept anything else, but before I leave, I’m going to go through what I imagine your reasons to be and what I think mine are. Just speak at any time and correct me if I’m wrong.”
- “As I see it, your community would benefit from the multiple-stage process by . . . .”
- “The possibility of our constructing this project in stages would benefit us by . . . .”

- "Using the criteria we discussed would rule out doing the whole project right away because . . . ."
- "However, building the structure first and then (for example) redesigning the stoves to accommodate the cooking vessels for the community laundry in two stages would meet the criteria of being good for the village as a whole, would allow us time to raise funds that will be necessary for the second stage, etc. . . . ."

When you have the situation wrong, the other side seldom can resist telling you so, which in turn gives you a better view of their reasons and interests.

It is better to separate a negotiation into stages and hold a second or third or fourth meeting than to accept or withdraw hastily. The differences in languages can nearly always justify offering to come together later after your team has had a chance to gather more information, get clarification, contact someone for background on costs, rules, and so on, and talk together as a team. Before the next meeting, you can talk as a team to think of what deep culture values, such as having all members of the village benefit equally, may be offended if you choose to pay funds to one group or one individual. It may feel that you are working in slow motion when you intended to accomplish many things quickly, but being deliberate and warmly cordial can help you keep from making a major, poor agreement.

#### 1.1.1.6 Games People Play at Meetings—and How to Stop Them

Several years ago a noted psychologist, Eric Berne, described games people play in a book by the same name. Two of those games, fairly harmless ones, can take a lot of time in a meeting and block productive action: "Ain't It Awful" and "Why Don't You, Yes But." You can certainly indulge in these when you want to, but sometimes you'll want to recognize them and stop them so that the group can move on to other actions.

**Ain't It Awful** is played by two or more people who take turns describing offensive, unsatisfactory, or "awful" things—the weather, the lack of parking, the obtuseness of professors, the taste of the food, and so on. Each person assures the other that what he or she has described really is "awful" and then goes on to add a tale of his or her own:

##### Example 1.1

- **Billybob:** Sheez, those beans tasted terrible. I think they must have been on the stove for a week.
- **Carleen:** You're right, they should have served them with antacids. But I thought the salad was worse. I found a bug crawling on one of my lettuce leaves, and that orange stuff looked like melted plastic.
- **Billybob:** The dorm food is horrible. I'll bet they stay up nights figuring out what to disguise as food for breakfast . . . .

To stop "Ain't It Awful," you have to switch to negotiation and separate Billybob from the problem: "Well, have you asked them to serve something else? What would you really enjoy?"

**"Why Don't You, Yes But"** can be played by any number (two or more). One of the persons must play the role of the "refuser" who deflects all proposed solutions by saying "Yes, but . . ." and adding at least one reason that a proposed solution wouldn't work.

##### Example 1.2

- **Carleen:** You're right, they should have served them with antacids. I really mean it. We should be able to pick them up and put them on our trays.
- **Billybob:** Yes, but the administration would never approve that because it would be practicing medicine without a license and someone would complain that we were encouraging people to medicate themselves unnecessarily.
- **Carleen:** Maybe so. We could get a petition up with a list of the things we want them to serve at each meal and they could pick stuff just from that list.

- **Billybob:** Yes, but they want to be able to take advantage of special sales, and besides, we'd never get everyone to agree because some of the kids have such limited preferences.
  - **Carleen:** Maybe we could get the dietician at the health center to draw up a list of acceptable choices.
  - **Billybob:** Yes, but he probably wouldn't put anything on the list that we really like, like pizza. Yuck! It would probably all be rabbit food.
  - . . . and so on.
- To stop "Why Don't You, Yes But," use a question to seize the role that Billybob has been playing and ask him (or her) for his ideas about solving the problem:
  - . . . Carleen: You're right, Billybob. If the dietician isn't the right solution, what do you think we should do?

### Example 1.3

As soon as Billybob replies, Carleen can then say, "Yes, but . . ." An even better strategy is, at that point, to shift into finding out motivations and desires and then move into the negotiation sequence and invent options for mutual benefits.

#### 1.1.1.7 How to Apply Negotiation Principles to Other Meetings

Not all meetings are intended to resolve differences. You've probably attended some that celebrated a victory or accomplishment or one that brought people together after being away from campus all summer. Some of those meetings may have turned into a consideration of future proposals or recent problems. At that point, you can shift overtly or subtly into the four points of the negotiation strategy:

1. Finding out people's reasons or interests
2. Inventing options for mutual benefits
3. Choosing objective criteria
4. Reaching a principled agreement.

It's really simple, once you get that framework in mind!

#### 1.1.1.8 Understanding What You're Told in a Negotiation

Problems can arise when people do not speak fluently the language in which they are communicating. They may not hear the exact meaning that another has expressed. In most languages there are multiple ways of expressing an idea. Not all statements of agreement mean the same thing. In Mexico there are at least five different ways of promising, with these different meanings:

1. *Me comprometo* = I commit myself
2. *Yo le aseguro* = I assure you
3. *Si, como no, lo hago* = Yes, sure I will do it.
4. *Tal vez lo hago* = Maybe I will do it
5. *Tal vez lo haga* = Maybe I might do it.

These meanings are arranged in a hierarchy starting with the most committed intention and ending with the least committed. In **Understanding Intercultural Communication**, Samovar, Porter, and Jain point out that "this agreement concept ranges from a durable agreement that everyone recognizes to an agreement being unlikely. The problem, of course, is to understand the differences . . . in their cultural sense so that a correct version can be rendered in another language." In some cultures, such as Mexico, refusing a request is judged to be extremely impolite; as a result, a person may be evasive. Since Americans

believe in being direct and assertive, they may be extremely frustrated when they have been told, “Yes, I will work on the project on Saturday,” but the person does not show up. In this case the local person may have been saying “yes” in a less committed way that the US listener misunderstood. The speaker expressed a form of agreement just to preserve the friendly relationship.

NOTE: It is wise to ask a local contact about how people express commitment, promises, and excuses so that you can listen for the degree of agreement and not fail to understand the level of commitment that someone is expressing.

**Summary:** When you hold a meeting in an intercultural setting, differences in status, values, background, and education can foster quite different expectations and cause misunderstanding. To achieve mutual agreement, follow a process that separates four steps (the basis of the Harvard Negotiation Process as set out by Fisher, Ury, and Potter): find out people’s motivations or interests, invent options for mutual gains, choose objective criteria, and reach agreement. Tools like paraphrasing and indirect narratives may be helpful depending upon the culture. Remaining positive, respectful, and flexible or firm when necessary are keys to success.

### 1.1.2 ASSIGNMENT

This assignment occurs in two parts, A and B. We thank Sean McCudden for his help in developing this assignment.

#### Part A.

During the first visit to Las Flores, the three-person engineering team decided that on future visits it should live in the village. Their faculty advisor had recommended that they do so, arguing that they would learn more about the local culture and ways of doing things than if they stayed in Nuevo Guerrero, about a two-hour drive over difficulty roads.

The team’s next visit is timed to occur when school is not in session, so the team believes they should be able to sleep at the school, where there is room for their bedrolls, equipment, and space for working together. It is a small building with no glass in the windows and a hard-packed dirt floor. Furthermore, Olivia Cera, the sister of a community leader, Juan Cera, has offered to cook for them and bring their meals to the school house. Indeed, the people of Las Flores have very few resources, and feeding the team for nine days would be a burden to any family. The team feels it must pay for its shelter and meals.

The team will offer to pay for their meals (they hope \$20 per person per day will be enough, but they also could pay by bringing Olivia the new stove that she wants). They must also determine whether there will be a charge for staying in the school during the five-day visit.

**Questions.** What differences in initial positions and in deep values do you think might surface in this meeting? Write a paragraph forecasting some of the differences in the team’s and Juan’s benefits and motives. How might these differences affect the team’s relationship with the village people if the team agrees to the request?

#### Part B.

The Engineers without Borders team is returning to the village of Las Flores. Part of its mission is to test the community’s water for bacteria. In order to incubate the samples overnight, the team has brought a gasoline-powered generator from the United States. The community’s power resources are limited. During its last visit the team installed solar panels, but there is no battery storage. The people in Las Flores have no other source for electricity. They thought providing their own energy source was the least they could do; further, without battery storage the team would not have any electricity overnight. The generator would come with them, stay with them, and leave with them.

When Juan saw the generator, one of the first questions he asked was how much it cost. The team told him, which must have been a significant portion of his income, and he asked if he could buy it. The team was taken aback, by Juan’s offer. They told Juan they would consider it, but they had to think about it first.

The team sat in the school house and discussed Juan's offer. They had brought it because of the short duration of the visit and the limitations of the electrical resources in Las Flores. They had failed to recognize it as a luxury for a community with a vastly disparate standard of living. They realized that they should have expected Juan's offer. The team decided that the generator would be more valuable in Las Flores than in a storage room at the university. The team agreed among themselves that it would be better to sell it to Juan.

However, the next morning Juan changed his offer to a trade: free meals from his relative, Olivia, who had agreed to cook for the team during this visits, in exchange for the generator. This brought back memories of another cultural misunderstanding that occurred during a previous trip to another village a few years back. The team had agreed to pay Sara in cash because when the organization had used a system of exchange for material goods, it had caused conflict in the community, which perceived the team's exchange as unwarranted gifts-favoritism.

The team is now convinced that it cannot "give" the generator to any individual because it wants to maintain a perception of equality in a community in which they are seen as "wealthy Americans who have expensive tools." To the villagers, the generator-tangible and immediately useful-seems to be more valuable than the team's abstract promises of cleaner water and healthier bodies. The team takes electricity for granted and had instead focused on what it considered to be a more basic need-water quality-but which was less exciting to the community.

### Questions

Why do you think Juan changed his request? How would selling the generator to Juan affect the team's relationship to the community? What options for mutual benefit might the team devise, keeping in mind the differences in cultures that the situation reveals? What options do you think Juan would propose? If the woman is to do the work that "pays" for the generator, should she be the one to own it? Come up with at least two options and the criteria that you think should govern the decision.

## 1.1.3 STUDENT ENGINEERS' COMMENTARIES

### 1.1.3.1 Roque Sanchez: Meetings and Meeting the Challenges of Intercultural Communication

After my unprepared and haphazard introduction to interpreting and translating during my first Engineers Without Borders summer trip to El Salvador, I am glad to know that there is a theory and process to working on intercultural projects. While I found that learning about general cultural differences between the United States and Latin America was interesting, what I most appreciated about the Engineering Communication class are the concrete examples of strategies we can use to connect with our communities. After our class discussions and readings, I have been able to reflect on three specific realms of strategies that I think will be most applicable for our next trip to El Salvador: planned introductions, process descriptions, and meeting structure.

During our last trip, the extent of our planned introductions to the community consisted of us saying our names at the beginning of our first community-wide meeting. . . . I think that we could have gained the community's trust faster if we had planned contacts with the community before we left for El Salvador. To avoid taking too much time out of meetings when we are in El Salvador, I think a solution will be to have each team member write a short biography that can be put along with their picture on a poster. We can ask our local contact, Tamar, to put the poster up in either the primary school or up at the public washing stations so the community can have a chance to "meet" each team member on their own time. Since illiteracy is still high in rural El Salvador, we can also request that community leaders read the short biographies at the water board meetings or at the end of a church service.

Our last trip was mostly survey work with minimal help from the community. During our next trip we will construct the water system for the community. During our two weeks' visit we will have to construct the foundations for the two water tank sites as well as lay the distribution pipe through the community. This will require a lot of sweat equity labor from the community in order to complete the project on schedule. We must be prepared to explain the construction process to the volunteers. The first step in doing this is making sure that we understand how construction will be planned, and we started by making flowcharts at

our organization's last meeting. By having the process written out I can better think through how to explain it in Spanish, and I will also have time to look up any new vocabulary; our schedules will be tight in the village, so just taking time to think about how to explain the construction process to the community will spare me undue stress.

As I have mentioned, our team meeting strategies need to be re-thought. . . . Our last community meetings placed me as an interpreter between community members and the EWB team. As the meeting moderator. I have found that it is very difficult for me to translate and think independently at the same time. It would be best if one of the project leads actually runs the meeting. I also think that segregating the team from the community members will only reinforce our separation from them.

In the new setup I envision, most of the team members will sit scattered in the audience with the rest of the community, and I will stand at the front of the classroom with the project leads and several community leaders. The project leads will run the actual meeting by talking to me in English, in a voice that is audible to the audience and the EWB members, and I will then translate what he or she has said into Spanish. Of course, I will be able to prepare introductions and other explanations ahead of time so I will not have constantly turn to the project leads. With only the meeting-essential EWB members at the front of the classroom we can center the attention on them, and by keeping the leaders—our group and community—together we can hopefully keep better control over the meeting without stifling discussion.

While I believe I was able to pick up useful communications strategies in the field, this course was able to speed up the learning process. Because we have such a short time to do our work in El Salvador, it is important that we can make the most of it while still keeping the community's priorities in mind. Rice EWB is also responsible for keeping in contact with the community long after the original project is finished, so it is important that we are able to not only help the community in the short term, but to be able to forge a relationship that will allow the community to better help itself in the future. I hope that our future projects can incorporate the practices we have learned about, such as participatory rural analysis, so that future EWB members can also learn, before they leave the country, that there actually is a process to the chaos of working on rural development projects.

### 1.1.3.2 Jessie Gill: Meetings and Assumptions

Looking back over my description of the Oniel Stove and the way my team introduced the water distribution and purification systems, I wonder if it is culturally appropriate to tackle the issue of cost "head-on"? Should we allow the community to raise these questions? When we made our introductions we said that it would be an inexpensive system, but by whose standards? And, by stating costs up-front, will they perceive that we are judging them for not being able to pay? We decided in class that effective presentations 1) explain why we chose this system, 2) describe (briefly) the process and technique, 3) describe how it operates and must be maintained, and 4) address costs. I am not so sure that this is an appropriate method. How do we both begin and end the meetings on positive notes in a spirit of cooperation?

In presenting a system, it is important to simplify the system and first give an overview with few details. Seeing as how Nicaragua is very much a story-telling culture (although not as much as India), it would be interesting to describe the system in terms of a story. We could introduce ourselves and describe how we were part of the design process while taking other classes, spending time with our families and friends. We can talk about sketching designs out on a napkin or calling each other in the middle of the night when we realized that something just had to be changed or done. I think that this would humanize us more and make us partners in this process rather than experts. Even as we describe how a system functions, perhaps we should make fun of ourselves during this time. After all, we "gringos" don't always know how to mix concrete so well. . . .

### 1.1.3.3 Deepa Panchang: How to Change Our Meetings

. . . Asking the assembled community members to set ground rules for meeting etiquette is an excellent idea to ensure that things don't get out of hand and that the agenda is covered. Posting an agenda at the beginning is also a useful idea. Having children perform skits related to the project could also be fun

and interactive. Translation during meetings can also be tricky, and personally I think the best technique is to have a “translator’s assistant” who can understand what is going on and translate to the rest of the group, without the translator having to interrupt the conversation each time. However, I do recognize that these techniques all vary with community characteristics and different procedures may work for different communities. Having separate meetings for women and men can also be a good technique for accommodating the varying roles they take and to make up for any possible inequality in representation.

#### 1.1.3.4 Alec Walker: “Meeting” in a Tavern to Negotiate a Ride from Huang Hua Cun

After four long days of trekking through jungle rice trails and half-finished dirt roads, I was exhausted, hungry, and sore. It had rained several times each day, so that my socks made squishy sounds as I walked and my toes had gotten used to their wrinkles. I arrived in Huang Hua Cun (in the People’s Republic of China) at 16:00, the last destination of my trek and the major trading post of all the surrounding villages. I was dazzled by sunlight reflecting on cement and by the sounds of people talking. I hadn’t spoken with anyone since the early morning, when I left the village where I had spent the night. My objective, I nervously remembered, was to find a ride to the major town about 25 kilometers north so that I could catch the last bus back to Jinghong at 19:00. I remembered the words of the Dai women I had met in a night market almost a week ago, “Ask in the restaurants,” they’d said, “The owners all have cars, or they know people with cars. Don’t pay more than 25 yuan.”

I only found one restaurant in the entire town, though I stumbled around the winding and steeply sloped road looking for more. I wanted to find a larger one, one with red lanterns hanging from a real awning, the one from my imagination, with a car out front. I had reached the end of the town. I walked back to the restaurant, a 16-square-foot wooden, three walled building with a few mismatched chairs and two tables. I walked in and stood nervously, looking in desperation for someone with a knowing, helpful expression on their face. There was one woman and about six men in the restaurant. The men were smoking, and they looked up at me from the table with narrowed, inquisitive eyes.

**Starting with an Apology.** I decided to start by apologizing for being so wet. This went well, as several of the men laughed and one asked me how long I’d been out in the rain. I didn’t have time to answer before another man stood up. “There’s no issue,” he said, standing up to offer me his faded sky-blue plastic chair, “this place gets wet all the time.” “We have a good roof in here, though” the other man who had spoken to me added proudly.”

**Using indirection.** I wanted to figure out who owned the restaurant, and I wasn’t sure which of the two speakers to try first. For some reason, I didn’t feel comfortable asking outright. I didn’t know the word for tin, so I commented on how the other villages I had been to didn’t have any of the same kind of roof. I meant it as a compliment, to express that the roof was a rare one and that its owner should be proud, but the room was silent. They all looked at me with strained expressions, as if having failed to understand. I set my backpack down on the chair and made a show of stretching my shoulders. This made them all laugh, and I felt I had once again diffused the awkwardness. Someone teased me, expressing surprise for my having used the chair for my bag and not myself.

**An unexpected reaction.** I still felt uncomfortable asking who owned the restaurant, so I mentioned the bus out of the major town and asked if anyone could give me a ride to it. The men’s expressions lost their humor, and a few swiveled their chairs back to the positions they had been in before my arrival. They seemed ready to ignore me and continue what they were doing before. One told me he had a motorcycle and would take me for 40 yuan, if the roads were not too muddy. I told him I had heard about car rides for 25 yuan. He told me I wouldn’t find that in the village. I told him I was going to go ask around the town. He seemed offended that I wanted to verify his word. I went all the same.

**Asking directly.** I asked several people. Most stopped for a minute and looked surprised, ignoring my bad Chinese. I had grown accustomed to this kind of reaction when walking through villages in Xishuangbanna, but I hadn’t ever been looking for anything urgent or even specific before. One man had a motorcycle under his house, and he told me that he wouldn’t take me because the roads were too wet. He finally offered his services for 100 yuan, and I left him for the restaurant.

**Power interactions.** The man in the restaurant who had offered me the ride had a mobile phone, which he was using when I entered. He saw me and nodded as one would nod to an old friend who needs to temporarily be ignored until the serious business at hand is completed. I smiled and stood there awkwardly under the gazes of the others. I felt embarrassed and guilty for having mistrusted the man on the phone, but I scolded myself for projecting ungrounded explanations for the attention I was getting and for being so quick to trust the man now. The man hung up, brought the phone away from his face to type something, and then made another call. He avoided my gaze. I assumed this was punishment, and my slight anger was checked by my helplessness.

**Unexpected agreement.** He only remained on the phone for a minute, and then he hung up and smiled at me. I started to apologize and he shushed me. I asked him if I could pay him part of the money when I got to the bus. He laughed, then abruptly stopped and said “I’m not going to take you.” I was shocked, then immediately angry with myself. “No, he’s going to take you.” I looked to where his finger pointed and saw a very large and strong bald man in an undershirt walking uphill toward the restaurant. The man with the mobile phone told me goodbye and then shooed me towards the door. By the time I realized that I was going to pay the driver and that the man with the phone was just a friend of his, it was too late to thank the man with the phone.

**Afterword.** I was confused by faulty information about what kind of ride business to expect in the town. I was unfamiliar with the local culture and my language abilities were not expert. I was balancing my haste against my budget and my desire to be polite, and all of this resulted in misunderstandings and communication failure that might have been avoidable otherwise. The best way to have achieved my objective while minimizing risk of offending anyone would have been to allow myself more time. I could have spent the night at another village that I passed less than a mile from along the way, and then I would have had a full afternoon to negotiate a ride to the bus. Alternatively, I could have paid a higher fee and spent the night in the town. This high fee would actually still not be more than a few dollars at most, and although it can be advantageous to adopt the local perception of money expenditure, sometimes it is best to use money to compensate for the disadvantages that come from being a new foreigner.

In summary, when you hold a meeting in an intercultural setting, differences in status, values, background, and education can foster quite different expectations and cause misunderstanding. To achieve mutual agreement, follow a process that separates four steps (the basis of the Harvard Negotiation Process as set out by Fisher, Ury, and Patton): find out people’s motivations or interests, invent options for mutual gains, choose objective criteria, and reach agreement. Tools like paraphrasing and indirect narratives may be helpful depending upon the culture. Remaining positive, respectful, and flexible or firm when necessary are keys to success.

### 1.1.3.5 END OF MODULE

END OF THE MODULE

## 1.2 Essentials of cross-cultural communication: Guide for American professionals.<sup>2</sup>

### 1.2.1 Essentials of cross-cultural communication: Guide for American professionals.

#### 1.2.1.1 Chapter 1. Introduction: Basics of cross-cultural communication.

We see the world through a cultural lens. We observe and filter the sensory stimuli through learned cultural patterns. Because cultural values, attitudes, and behavior are the habitual responses of a group to its environment, the values, the attitudes, and their resulting behavior are often beneath consciousness. Our

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<sup>2</sup>This content is available online at <<http://cnx.org/content/m36647/1.3/>>.



culture surrounds us, like the air we breathe. Our culture is like the mineral content of a municipal water supply, invisible and often unnoticed until someone points it out.

As Trompenaars (2003, p. 24) advised,

*"Culture is beneath awareness, yet it forms the roots of action."*

Because the habits of our culture are beneath awareness, and because we naturally tend to feel most comfortable acting in the patterns of our own culture, we tend to follow a consistent pattern of culturally determined responses even when immersed in a different cultural setting. That is why cross-cultural interaction sometimes results in cross-cultural misunderstanding.

Adler (2008, p. 19) has explained that culture is formed from *values, attitudes, and behavior*. In the cross-cultural setting we naturally respond according to the values, attitudes and behavioral norms of our own culture. Our counterparts naturally respond according to the values, attitudes and behavioral norms of their own culture.

If something goes wrong, if the cross-cultural transaction is not successful, it may happen that neither side considers a cultural explanation for the misunderstanding. It may be that each side simply concludes that *those people* are difficult to deal with. Or perhaps each concludes that the other is unprofessional and lacks common courtesy.

When interpersonal interactions go wrong within the cross-cultural setting, does the source of the trouble lie in personality or in culture? While it is often difficult to answer this question, a knowledge of cultural differences and how to manage them is an important tool in the professional kit, right next to techniques for coping with personality differences.

### 1.2.1.2 Definition of culture.

Let us first establish a definition of culture. What is culture, after all? Trompenaars (2003) posits that humans everywhere face an array of survival tasks, a common set of human dilemmas. The American psychologist Abraham Maslow (as cited in Straker, 2008) has provided one description of these common tasks, which he called a hierarchy of needs<sup>3</sup>. Humans everywhere need food, water, shelter, and safety. In Maslow's explanation, humans also need a sense of love and belonging, they need a sense of self worth, and they need to aspire to something greater than themselves, what Maslow called self actualization.

So if we accept that humans everywhere face the same core dilemmas, the same survival tasks, and that humans everywhere have the same needs, we can ask about the ways that humans solve these problems and meet these needs. Culture, according to Trompenaars (2003), can be defined as the way that distinct groups of people habitually go about meeting common human needs. Culture is the aggregate of preferences among most people in the group for one set of solutions over the range of possible solutions available to them.

Looked at from this perspective, we can see that people in Pakistan and people in the USA would have the same need for a sense of love and belonging. One norm for meeting this need in the USA is romantic love leading to marriage. A widespread norm for meeting this need in Pakistan<sup>4</sup> is arranged marriage, leading to romantic love. In Pakistan for many couples, first comes marriage, then comes love.

It is the other way around in the USA.

In Kyrgyzstan<sup>5</sup>, up until recent times, the need for love and belonging was sometimes met by the practice of "bride kidnapping," a custom that would surely result in a prison sentence, not marriage, in the USA.

### 1.2.1.3 Cultural preferences.

Culture then, is *the way that distinct groups of people habitually go about meeting common human needs*. Everyone needs to eat, but some cultural groups prefer rice while others prefer bread.

More simply, culture is "the way we do things around here." Why in the USA do people prefer to measure in feet, inches, pounds, gallons and miles? The US military uses the metric system, science uses the metric

<sup>3</sup><http://changingminds.org/explanations/needs/maslow.htm>

<sup>4</sup>[http://www.pbs.org/frontlineworld/rough/2006/12/pakistan\\_this\\_i.html](http://www.pbs.org/frontlineworld/rough/2006/12/pakistan_this_i.html)

<sup>5</sup><http://www.pbs.org/frontlineworld/stories/kyrgyzstan/>

system, and most of the world, outside the USA, uses the metric system. So why is it that the USA does not use the metric system in commerce, in transportation, in construction? The answer seems to lie in culture, in "the

way we do things around here." We in the USA seem to *prefer* to measure in feet, inches, pounds, gallons and miles. We like it that way.

#### 1.2.1.4 Focus on national culture.

The definition of culture provided here, *the way that distinct groups of people habitually go about meeting common human needs*, is meant to refer to regional or national groups, not to smaller groups or subcultures within nations. Indeed, subcultures within nations and the culture of organizations large and small is a topic with similarities to a discussion of national cultures, but that discussion is beyond the scope of this study.

#### 1.2.1.5 Norms within a culture.

Working from our definition of culture, *the way that distinct groups of people habitually go about meeting common human needs*, it is important now to isolate the concept of norms within cultural group. To say that Japanese communication style is more indirect (Bjerke, 1998, p. 185), compared to the style in the USA, is to speak of norms that apply to most people much of the time, and *not to all individuals or all situations all of the time*. It is a starting point for the American business traveler to be weighed against experience. It is quite possible therefore that the American business traveler would encounter Japanese colleagues who were surprisingly blunt in communication style, but that would not be the norm.

To say that the style of nonverbal communication during business meetings in Mexico reflects closer personal distance between individuals, compared to the style in the USA, is to speak of norms that apply to most people much of the time, and not to all situations all of the time. It is the norm in Mexico that greetings involve a kiss and distance between two people in conversation is closer than it is in the USA, but that does not mean that all people act in this manner all of the time.

As Trompenaars (2003, p. 24) explained,

*"People within a culture do not all have identical sets of artifacts, norms, values, and assumptions."*

Adler (2008, p. 21) made a similar point:

*"A cultural orientation describes the attitudes of most people most of the time, never of all the people all of the time."*

#### 1.2.1.6 Are cultural differences real?

If there is a lot of variation around a norm in one culture compared to another, is the attempt to describe cultural differences valid? We said earlier that people everywhere are in fact the same in the sense of basic human needs as described by Maslow. If the language of business is business, if the language of engineering is engineering, can we

not proceed therefore assuming similarity rather than assuming differences among cultures? Can we not assume that cultural differences are superficial and that once we get down to business, we can be ourselves because cultural differences will quickly disappear?

The answer for this study is no. The premise for this study is that cultural differences are real and they do affect the outcome of professional encounters in the cross-cultural setting. To arrive in an unfamiliar cultural setting without a knowledge of cultural differences and a readiness to cope with them is to arrive with a lower chance of favorable outcomes.

To act without awareness of differences among norms within a differing culture is to invite cross-cultural blunder. Differences among norms can include norms for the type of gift and whether a gift is customary,

norms for the timing and mix of social chatter and serious business discussion, norms for the style and place of humor, norms for roles within a hierarchy, norms for timing, sequence, and punctuality, and norms for nonverbal communication, to name a few. The tourist typically has the luxury of isolation from the consequences of cross-cultural blunders, but the professional traveler has a lot more to lose, especially when the traveler is trying to sell a product, negotiate a deal, or generally leave a favorable impression of the home organization.

#### **1.2.1.7 Judging cultural differences.**

Our own culture surrounds us, yet its influence on our values, attitudes, and behavior are quite often invisible to us. See the Trompenaars quote above. Our culture feels normal, like normal room temperature, a temperature that we would not notice at all unless someone changed the thermostat to make us too hot or too cold. Interaction with a different culture is like a change in temperature. Sometimes the cultural temperature is set at a level that may well seem incorrect, too warm or too cold. When this happens, we are not likely to say, "Oh, the temperature is now different." We are more likely to say, "It is too warm in here." Or, "It is too cold."

So it is when we encounter cultural differences. We do not notice the patterns of our own culture until we are confronted with a different pattern, and then we are likely to regard it as something wrong, something incorrect. We use our own culture as the standard, and rate the difference against that standard. The result is typically judgmental. We apply a standard such as the American emphasis on digital punctuality to a culture where such adherence to a schedule is not so highly prized, where the sense of time more easily allows spontaneity, where timing is more about sequence and doing the right thing at the right time. Both sides may judge the other as not having a proper sense of time. Each is keeping to its own sense of time which in its context seems proper, correct, propitious.

#### **1.2.1.8 Barriers to effective cross-cultural communication.**

The tendency to rate cultural differences as correct or incorrect, using our own cultural as a standard, is a habit that often impedes understanding and stands as a barrier to effective cross-cultural communication. Such judgments are often irrelevant when applied to a different cultural context.

In each context, the correct way to go about meeting life's needs has culturally specific norms. Whether it is correct to kiss, bow, or shake hands when greeting depends on the culture. To assume, following the greeting, that the American sense of first-name informality works anywhere is to invite misunderstanding between message sender and message recipient. The resulting misunderstanding stands as a barrier to effective cross-cultural communication.

To accept cultural differences as valid in their own context does not require universal approval of every exotic variation and it does not require changing one's own values. It would be a stretch for most Americans to accept bride kidnapping in Kyrgyzstan as making sense in any context. As a general principle, however, it is prudent to identify and recognize cultural differences while suspending judgment.

#### **1.2.1.9 Can we rank cultures from primitive to advanced?**

The tendency to approach a different culture with judgments about its sophistication, advancement, or espoused values is a natural response to the cross-cultural encounter. Unfortunately, our tendency to quickly appoint ourselves cultural judge stands as another barrier to effective cross-cultural communication.

It is natural that we would rank other cultures as primitive or advanced in their use of technology. The Stanley Kubrick classic *2001: A Space Odyssey* vividly shows us how tool use might have separated early hominids from anthropoid apes. Historians, archaeologists, and anthropologists often rank cultures according to their economic development from hunter-gatherer to agricultural to industrial to advanced technological. In his fascinating book *Empire of the Summer Moon*, for example, Gwynne (2010, p. 27-32) described the Comanche as "Stone Age hunters" having:

*"A remarkably simple culture. They had no agriculture and had never felled trees or woven baskets or made pottery or built houses."*

Gwynne explained that,

*"No true plains tribes fished or practiced agriculture before the horse, and none did so after the horse... They remained relatively primitive, warlike hunters."*

Unfortunately, ranking cultures from primitive to advanced is not useful when we seek to communicate effectively across cultures. Ranking cultures from primitive to advanced is

a judgmental exercise that impedes effective cross-cultural communication. Why? First of all, a hasty assessment of technical sophistication, which may begin as soon as the traveler touches down in a foreign airport, readily establishes a superior to inferior relationship that quickly leads to ethnocentrism and parochialism.

Secondly, ranking cultures from primitive to advanced, using technological or economic advancement as the criteria, may block our opportunity to appreciate a culture at the higher levels of Maslow's hierarchy, where social organization, history, art, spiritual beliefs and intellectual pursuits lie. Upon further investigation we may find that wealth and quality of life can be defined in a variety of ways beyond leading economic indicators or Internet access. Consider the Amish lifestyle in heartland America, for example, as a culture where quality of life is not measured by the same standards as we find in the mainstream surrounding culture.

Finally, the attempt to rank cultures inevitably shows the bias of the observer. As Adler (2008, p. 14) observed,

*"People in all cultures are, to a certain extent, parochial."*

In other words, we all tend to see our own way of life as best and we all tend to rank our home country as the best place to live. This is often true whether or not the home country would rank highly on a scale of economic or technological development. As noted above, there are other ways to rate quality of life apart from economic or technological development. Within the cross-cultural setting, it is useful to keep in mind that our counterparts love their home country just as we love ours. Americans are not the only people who see their own way of life as best and their own country as the greatest place to live.

Adler (2008, p. 136) provided an example of the sort of cross-cultural misunderstanding that can occur when we rank cultures according to technological advancement:

*"Members of a team of engineers, for example, assumed in their American colleagues at more technological expertise than did their Moroccan colleagues simply because Morocco is less economically and technologically advanced than the United States."*

This sort of faulty cause-effect conclusion -that we can reach conclusions about intelligence and education based on where a person is from- is a barrier to effective cross-cultural communication.

The same faulty logic applies to language use. When a foreign visitor speaks our language with a lot of errors and strong accent, we tend to subconsciously assume that the person is a little short on intelligence or at least poorly educated. Any of us who have spent time in Latin America with only basic Spanish, however, know well that language facility is not a function of intelligence, but rather a function of time, practice, opportunity, motivation, and so on. We are no less smart because of weak facility with

Spanish, and our education in other matters still holds, but we may appear to the local listener as a little slow, if our production of the second language is full of errors.

Related to our tendency to rank people on their ability to speak our language, we may also find ourselves ranking people on the extent to which we judge them to be *Americanized*. This too is a judgment that impedes effective cross-cultural communication. While it helps cross-cultural conversation when a foreign counterpart knows something about our music, art, sports, and news, we can severely limit our opportunities for successful outcomes if we focus our attention primarily on those whom we deem to be more *Americanized*. Some people, after all, do not especially want to become *Americanized* for various reasons, just as an American who has

lived for years in Japan might not want to seem too foreign, too Japanese, when coming back home to the USA.

Our willingness to avoid ranking cultures from primitive to advanced is especially significant for Americans as we enter the new economy of the 21st century. At least since World War II, Americans have become accustomed to a view of the USA as leading the world economically and technologically. That leadership may not be so prominent in various sectors in coming decades, and American travelers may at times find themselves on the short end of a technological or economic ranking.

#### 1.2.1.10 Strategy for cross-cultural communication.

An effective strategy for cross-cultural communication is to suspend judgment. Observe, keep an open mind, and avoid the tendency to judge. Those of us raised within mainstream US culture may consider it irrelevant, if not unreasonably superstitious, that a Chinese real-estate client would avoid houses with the number 4 in the address, or houses with a U-shaped floor plan. But we do well to suspend judgment of the client's interest in *feng shui* (Bjerke, 1999, p. 162-163), take the information at face value, and use it to help the client find a suitable house.

Returning to the analogy of room temperature, it is usually more effective to say that the temperature is now different than to say, "It is too warm in here." Or, "It is too cold." It is more effective to say that the British drive on the left side of the road than to say that the British drive on the wrong side.

#### 1.2.1.11 Discussion topics - Exercise

1. Adler (2008) has explained that culture is formed from values, attitudes, and behavior. Visit the Web site of a PBS program about arranged marriage in Pakistan<sup>6</sup>. Read background information and watch the video.

Discuss:

Compare and contrast romantic love leading to marriage as a norm in the USA with arranged marriage in Pakistan. If we assume that the human need for love is the same in both the USA and Pakistan, what differences in values, attitudes and behavior would lead to such very different ways of meeting the human need for love in Pakistan compared to the norm in the USA?

2. Visit the Web site of Ford USA<sup>7</sup> and then compare with the Web site of Ford India<sup>8</sup>. Discuss. What are notable differences in the information presented, the type of vehicles promoted, and the techniques to attract customers. What has Ford assumed about attitudes of customers? How do those assumptions differ for Ford India compared to Ford USA?

#### 1.2.1.12 References:

Adler, N.J. (2008). *International dimensions of organizational behavior*. (Fifth Ed.). Cincinnati: South-Western College Publishing.

Bjerke, B. (1999). *Business leadership and culture: National management styles in the global economy*. Northampton, Massachusetts: Edward Elgar Publishing.

Gwynne, S.C. (2010). *Empire of the summer moon: Quanah Parker and the rise and fall of the Comanches, the most powerful Indian tribe in American history*. New York: Scribner.

Kubrick, S. P. (Producer & Director). (1968). *2001: A Space odyssey* [Motion picture]. United States: MGM.

Straker, D. (2008) Maslow's hierarchy. *Changingminds.org*. Retrieved from <http://changingminds.org/explanations/needs/maslow.htm>

Trompenaars, Alfons (2003). *Riding the waves of culture: Understanding cultural diversity in business*. (2nd ed.). London: Nicholas Brealey Pub.

<sup>6</sup>[http://www.pbs.org/frontlineworld/rough/2006/12/pakistan\\_this\\_i.html](http://www.pbs.org/frontlineworld/rough/2006/12/pakistan_this_i.html)

<sup>7</sup><http://www.fordvehicles.com>

<sup>8</sup><http://www.india.ford.com>

### 1.3 Basics of Negotiating<sup>9</sup>

This PowerPoint file of 10 slides outlines a four-step process for successful negotiation. Teams will learn to

- Discover participants' reasons or interests
- Invent options for mutual gain
- Choose objective criteria
- Reach agreement (or not)

From preparation and preliminaries to formulating a **Best Alternative To a Negotiated Agreement** (or BATNA), teams will learn what to bring to the negotiating table, how to listen actively and participate constructively while there, and what to do when negotiations don't go as planned.

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[http://cnx.org/content/m16047/latest/NegotiationBasics\(66\).mov](http://cnx.org/content/m16047/latest/NegotiationBasics(66).mov)

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**Figure 1.1:** Basics of Negotiating:Based on the Harvard Negotiation Project Principles

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#### Download Version: Basics of Negotiating

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**Figure 1.2:** Please click on the above link to download the PPT file

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### 1.4 Group or Team Communication Resources<sup>10</sup>

Many university courses require team presentations and collaborative reports. The materials listed below offer brief but salient advice on how to succeed with such assignments.

- Collaboration and Learning: Managing Groups<sup>11</sup>
- Group Leader Handbook<sup>12</sup>

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<sup>9</sup>This content is available online at <<http://cnx.org/content/m16047/1.1/>>.

<sup>10</sup>This content is available online at <<http://cnx.org/content/m17248/1.2/>>.

<sup>11</sup>"Collaboration and Learning: Managing Groups" <<http://cnx.org/content/m16597/latest/>>

<sup>12</sup>"Group Leader Handbook" <<http://cnx.org/content/m15920/latest/>>

- Guide for Team Presentations (Civil and Environmental Engineering)<sup>13</sup>
- Guide to Interpersonal Communication (Civil Engineering) (Section 1.6)
- Basics of Negotiating: Based on the Harvard Negotiation Project Principles (Section 1.3)
- Managing Conflict in Teams: Switching to Successful Negotiation (Section 1.5)
- Sample Chemical Engineering Student Team PowerPoint for Analysis<sup>14</sup>
- The Business Climate for Engineering Communication<sup>15</sup>

You may also wish to consult more general resources on communication:

- Speaking and Oral Presentations Resources<sup>16</sup>
- Writing Resources<sup>17</sup>
- Visual Design, Poster, and PowerPoint Resources<sup>18</sup>

You may possibly wish to search for

- Discipline- or Field-Specific Undergraduate Course Communication Resources<sup>19</sup>
- Discipline- or Field-Specific Graduate Course Communication Resources<sup>20</sup>
- Communication Evaluation and Planning Forms<sup>21</sup>
- Communication Teaching Resources: Assignments and Materials to Use in Class<sup>22</sup>
- Communication Teaching Resources: Integrating Communication Instruction into Courses<sup>23</sup>
- Communication Teaching Resources: Training Materials for Student Communication Mentors, Coaches, and Discussion Leaders<sup>24</sup>
- Resources for Professional Development and Communication<sup>25</sup>
- Resources on Thesis and Dissertation Preparation for Graduate Students<sup>26</sup>

**The preparation of these materials was funded through a generous grant from the Gordon and Mary Cain Foundation.**

## 1.5 Managing Conflict in Teams: Switching to Successful Negotiation<sup>27</sup>

### 1.5.1 Styles of Conflict Behavior

Use this resource to understand communication strategies for managing conflict.

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<sup>13</sup>"Guide for Team Presentations (Course: Principles of Environmental Engineering)"  
<<http://cnx.org/content/m15942/latest/>>

<sup>14</sup>"Sample Chemical Engineering Student Team PowerPoint for Analysis" <<http://cnx.org/content/m17121/latest/>>

<sup>15</sup>"The Business Climate for Engineering Communication" <<http://cnx.org/content/m16032/latest/>>

<sup>16</sup>"Speaking and Oral Presentations Resources" <<http://cnx.org/content/m17252/latest/>>

<sup>17</sup>"Writing Resources" <<http://cnx.org/content/m17253/latest/>>

<sup>18</sup>"Visual Design, Poster, and PowerPoint Resources" <<http://cnx.org/content/m17250/latest/>>

<sup>19</sup>"Discipline- or Field-Specific Undergraduate Course Communication Resources"  
<<http://cnx.org/content/m17242/latest/>>

<sup>20</sup>"Discipline- or Field-Specific Graduate Course Communication Resources" <<http://cnx.org/content/m17246/latest/>>

<sup>21</sup>"Communication Evaluation and Planning Forms" <<http://cnx.org/content/m17247/latest/>>

<sup>22</sup>"Communication Teaching Resources: Assignments and Materials to Use in Class"  
<<http://cnx.org/content/m17243/latest/>>

<sup>23</sup>"Communication Teaching Resources: Integrating Communication Instruction into Course Design"  
<<http://cnx.org/content/m17245/latest/>>

<sup>24</sup>"Communication Teaching Resources: Training Materials for Student Communication Mentors, Coaches, and Discussion Leaders" <<http://cnx.org/content/m17244/latest/>>

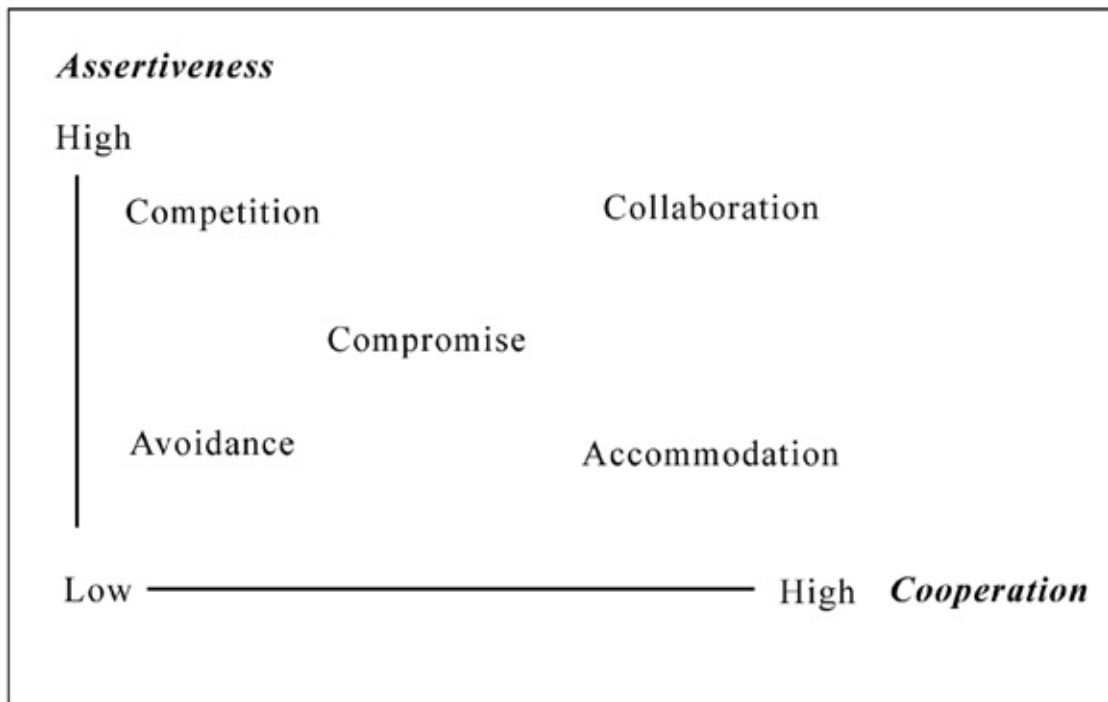
<sup>25</sup>"Professional Development Materials in Communication for Graduate Students"  
<<http://cnx.org/content/m17249/latest/>>

<sup>26</sup>"Dissertation and Thesis Related Communication Materials for Graduate Students"  
<<http://cnx.org/content/m17241/latest/>>

<sup>27</sup>This content is available online at <<http://cnx.org/content/m15934/1.3/>>.

Whenever you work on a team, team members may disagree. To move from those conflicts to resolution and successful teamwork, you first need to be able to recognize various styles of conflict behavior and adopt communication strategies to transform conflict into successful negotiation. The four steps in negotiation reduce internal conflicts so that the team can meet its goals.

In team disagreements, some members may act more assertively than others, while some may be more cooperative than others. Figure 1's two-dimensional grid shows five styles of conflict behavior that combine cooperation and assertiveness in different degrees. For instance, a **competitive** style is highly assertive but uncooperative; a **collaborative** style is both highly cooperative and assertive. Compromise misses the best of both cooperation and assertiveness.



**Figure 1.3:** This grid demonstrates how varying degrees of cooperation and assertiveness combine in styles of conflict behavior.

## 1.5.2 Communication Processes to Cope with Diverse Conflict Styles

Once you identify the behavior styles of your fellow team members, you can modify your own conflict resolution style. If your team uses the following communication strategies, you will be able to resolve conflicts and achieve results that benefit most if not all members.

### 1.5.2.1 Listening actively

Listening actively to the other person's point of view can help you judge how assertive and cooperative another person is. Active listening strategies include asking clarification questions, paraphrasing the other



person's statements to check the accuracy of your understanding, as well as acknowledging that person's feelings and encouraging him or her to keep expressing them.

By carefully listening to the other person's language, you can judge whether the person seems to lack assertiveness and is avoiding a direct expression of the problem. Draw such people out by asking for elaboration and clarification. On the other hand, if the person's speech is competitive (not cooperative but highly assertive), you can challenge that person to suggest some ways of accomplishing others' goals as well as his or her own. In addition, by using the method described on the next pages, you can uncover the other participants' perspectives and identify their needs and interests.

### 1.5.2.2 Noticing nonverbal signals

Active listening involves paying attention to verbal cues. However, in face-to-face confrontations, participants express themselves without words as well. If you notice these nonverbal signals while you listen actively, you can increase your understanding of the other person's assertiveness and cooperativeness. The other person's facial expressions, gestures, body posture, voice pitch, speech rate, and voice volume manifest intensity of emotion and feelings. Also, speakers should be aware of their own nonverbal signals. They should avoid defensive (uncooperative) signals and convey openness and supportiveness instead.

### 1.5.2.3 Imagining with empathy

Empathy is the ability to "put oneself in other people's shoes." Imagining how it would feel to be in another person's situation can help participants figure out others' reasons for being uncooperative or withdrawn. Empathy can also help participants imagine solutions to the conflict that might be mutually beneficial.

### 1.5.2.4 Choose words and manner carefully

How a person says something is vital. Drawing on active listening, attentiveness to nonverbal signals, and empathy, team members can imagine how others might react to a statement. This awareness will help them craft their language to avoid intensifying the conflict. Members can monitor what they say and strive to express their points without reducing the others' cooperativeness or willingness to continue talking.

### 1.5.2.5 Using "I-messages"

In a conflict, participants become less cooperative when they believe they are being blamed or criticized. Perceived criticism can cause shy persons to avoid further interaction. I-messages are statements that tell how **the speaker** feels or **how the speaker** perceives a situation without suggesting others have done so. Compare these messages:

"Your performance on the request for qualifications presentation was really poor."

"Everybody thought that you did very poorly on the presentation."

"I was disappointed by your presentation. I felt that you could have made a stronger point at the end."

The first two comments do not identify who owns these feelings. The first comment accuses the presenter of having done a poor job but it does not identify who owns the feelings. The second statement similarly fails to identify clearly who owns those feelings and instead suggests that "everyone" does. The third comment is a good example of an I-message because it clearly identifies who feels this way ("I was disappointed").

### 1.5.2.6 Respecting others: No ad-hominem arguments

**Ad-hominem** ("against the person" in Latin) attacks are arguments directed at the integrity of an opponent rather than at the problem. To gain maximum cooperation, everyone needs to focus on mutually beneficial solutions. Stay away from name-calling and focus on the issue at hand instead. Remember that personal attacks create resentment and are difficult to take back.

### 1.5.3 Four steps for resolving conflict: Principled negotiation

(adapted from Fisher & Ury, Getting to YES, 1983 - [click here](#) <sup>28</sup>for a summary).

Principled negotiation ideally results in resolutions that all can support. It encourages people to express their needs in an ethical, calm manner.

#### 1.5.3.1 Differentiate between the problem and the people involved

Fisher and Ury call this step “separating people from the problem.” Use empathetic understanding and active listening to understand why the other party has taken a particular position. (A “position” is a claim or recommendation, such as “We should use styrofoam for the struts.” Or “We should make the struts out of aluminum.” ) What are the features or dimensions of the problem that results from competing positions?

#### 1.5.3.2 Focus on interests, not positions

Every position rests on an underlying need or interest. To find the best solution, not one that depends on someone’s “caving in” or “getting a part” of what was wanted, participants must identify the interests or needs at the heart of each position. Empathetic understanding may again be necessary in order to understand why another person advocates a certain position. Consider the following statements:

“We should use PowerPoint for our presentation.”

“We should use a presentation board for our presentation.”

Both statements reveal positions without revealing the reason or belief behind them. The first position could stem from the person’s desire to showcase his or her technology skills, while the second could stem from a distrust of technology or a concern that the computer in the presentation room might not work. Knowing the underlying reasons allows a team to find solutions capable of meeting all concerns. For example, the team could assign the most experienced PowerPoint users to prepare the first version of the visual aids as well as reserve a backup laptop and projector to take to the presentation. (Another solution might be to print overheads for transparency projection if computer projection fails or is unavailable.)

#### 1.5.3.3 Invent options for mutual gain

The previous example shows how focusing on interests allows the group to develop creative solutions that reconcile everyone’s needs. Once the group has identified the interests underlying each position, it should brainstorm for solutions that exceed the original positions and benefit all sides. Be sure not to criticize solutions while the team is generating possibilities; delay decision-making until later.

#### 1.5.3.4 Apply objective criteria

Choose criteria that everyone agrees are fair and unbiased. In the preceding case, those criteria could be “benefiting from the highest level of skills the team can display” and “overcoming technology limitations.” Once chosen, each option should be ranked according to the criteria. If others will not agree to the highest-ranked option, talk with the instructor for guidance.

### 1.5.4 External Resources

NOAA Tutorial on managing conflict in a collaborative process

[http://www.csc.noaa.gov/cmfp/process/meeting\\_1.htm](http://www.csc.noaa.gov/cmfp/process/meeting_1.htm)<sup>29</sup> (Accessed November 7, 2007)

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<sup>28</sup>“Summary of Notes on the Harvard Negotiation Process” <<http://cnx.org/content/m15953/latest/>>

<sup>29</sup>[http://www.csc.noaa.gov/cmfp/process/meeting\\_1.htm](http://www.csc.noaa.gov/cmfp/process/meeting_1.htm)

## 1.6 Guide to Interpersonal Communication (Civil Engineering)<sup>30</sup>

As a professional civil engineer, you will be expected to negotiate a variety of interpersonal communications. Civil engineers frequently work in teams that include a diverse collection of professionals: other civil engineers, lawyers, environmental experts, city planners, and interested community members. These team members have different levels of expertise and different perspectives on a project. A good civil engineer will develop a range of listening and presentation strategies to communicate vital engineering issues and move the team toward its objective. This resource describes some of the most essential interpersonal skills in team situations (adapted from Joseph Devito).

### 1.6.1 Assess and Adapt

#### 1.6.1.1 Be mindful

In every communication situation, you should assess the role of the participants, the outcomes desired, and the communication options available to you, such as meetings, e-mail or phone calls, letters, memos, and so on. Carefully determine the best course of action to keep the team on task. For example, a brainstorming session may draw out many good ideas if contributors are of similar rank and are open to hearing from others, but meeting with individuals separately may make some lower-ranking people unwilling to speak out to you if high-ranking members tend to be judgmental when they don't immediately agree.

#### 1.6.1.2 Be flexible

Communication situations change constantly, potentially thwarting efforts to keep communication between and among teams consistent. A trusted member of a team may be temporarily; new directives may arrive from management; e-mail may be down; new members may be added to the team; an immediate deadline may be imposed, and so on. Because influential variables are in flux, strategies that might have been appropriate in one situation may be ineffective in another. Good communicators must learn to adapt messages to each unique communication situation rather than relying on the same messages or message types each time. You can become more flexible by regularly evaluating what is different about new situations and by remembering that new contexts may require unique messages or message strategies.

#### 1.6.1.3 Be culturally sensitive

Because civil engineering projects frequently span national boundaries, young engineers must expect that they will be entering into relationships with people from different cultures. Cultural sensitivity refers to a person's awareness and acknowledgement of cultural differences. When working with multicultural teams, make the effort to learn what different cultures consider appropriate or effective behavior. For instance, while eye-contact is highly valued in Western cultures, it may be considered rude between persons of different ranks in some Asian cultures.

You can learn about cultural expectations in interpersonal interactions by reading about the cultures of members or clients or simply by talking to members of your team. Be open to differences and show your genuine interest in learning; don't try to evaluate these differences from your cultural point of view. Differences are just that; there is nothing inherently good or bad about them. Rather, they represent a different way of looking at and doing things. In general, it is the client's culture that determines, how group members adapt to and interact with each other. For example, if the client considers introductory summaries presumptuous or high-handed because introductory summaries give the conclusion before the evidence, you may decide to send the summary only with copies intended for your north American or European company internally, not to the client.

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<sup>30</sup>This content is available online at <<http://cnx.org/content/m17115/1.1/>>.

## 1.6.2 Tips for engaging in dialogue

### 1.6.2.1 Be open and empathetic

An open communication strategy requires empathy—offering openness of communication and listening in return to openness with you. Empathy refers to the ability to put oneself in another person’s place. You can express empathy and invite openness in a conversation by maintaining eye-contact (providing the listener’s culture permits it), looking attentive, and remaining near the person with whom you are speaking. Using team members’ names can also help you establish empathy and trust. Use the level of formality in addressing the other person that his or her culture expects. Some cultures consider using first names rude, although using the first names of even complete strangers is common in the US.

In addition, consider the impact of listening attentively rather than speaking. Sometimes, listening well achieves more in a relationship than words. You also can begin your response by summarizing what you believe the other speaker has said before making your own point. This pattern of turn-taking enables the other person to confirm that you understood correctly and shows respect for the other person’s point of view.

### 1.6.2.2 Use I-messages

When interacting with a team member, use I-messages to take ownership of your thoughts and feelings. I-messages (for example, saying “I was confused” rather than “you were unclear”) clarify that the information you are presenting belongs to you, based on your feelings and perceptions. This clarity diffuses tension and criticism, enabling the recipient of the information to act on it.

Compare the following messages:

- Your performance on the request for qualifications presentation was really poor.
- Everyone in the group thought that you did very poorly on the presentation.
- I was really disappointed by your presentation. I felt that you could have made a stronger point at the end.

The first two comments do not identify who owns these feelings. The first comment simply accuses the presenter of having done a poor job without providing any context for the accusation. The second statement identifies a vague “everyone” as the source of accusation. The last statement is an example of an I-message because it clearly identifies the speaker, and thus a specific individual that can be queried or confronted, as the one with the opinion (“I was really disappointed”).

### 1.6.2.3 Use meta-messages

Meta-messages are messages that underlie the words spoken. They can affect how your message is received. Meta-messages can be communicated verbally or nonverbally. A question such as “Did you get that?” or “Does that make sense?” is a verbal meta-message. It’s a comment about the message you just sent. Similarly you can express meta-messages nonverbally. For instance, by putting your finger in front of your mouth while revealing a secret to another person, you send the nonverbal meta-message that this information is confidential.

You can increase your ability to meta-communicate by paraphrasing messages and communicating the feelings that go along with your message. You can also employ expressiveness to aid in understanding. By varying your voice rate, volume, and pitch, you can help listeners understand particularly important points or gauge yourself whether your audience is paying adequate attention. Remember, as well, that gestures and facial expressions are important meta-cues that can affect how your message is received. These meta-messages are also dependent on cultural context. Be careful that your signals are not misread, and that you do not misread others’ actions. For example, some Indian nationals use a side-to-side head rotation to signal agreement, the very signal that in the West suggests disapproval or disagreement.

#### 1.6.2.4 Be positive

Aim for a positive tone in your communications, making an effort to replace negative messages with positive ones. For instance, instead of saying “Your solution is stupid,” you might consider an alternative such as “I think the option we discussed earlier would address our problem more effectively.” Try always to make your counterproposal proactive and voice suggestions as improvements, rather than replacements, for ideas.

#### 1.6.2.5 Manage your interactions

Communication requires give and take. In a diverse team environment, success requires open communication, trust, and compromise. Interaction management refers to the strategies used to regulate the flow of communication in interpersonal interactions. As a speaker, you can regulate interactions by using appropriate cues to signal conversational turns. For instance, you may signal your willingness to pass a turn to the listener by dropping the intonation at the end of your sentence, or by keeping silent. As a listener, you can signal a turn request by using a gesture (such as raising your hand) or by opening your mouth.

Remember, oral communication is irreversible, even though it is fleeting. Once you say something, you can’t easily take it back if the listener is offended. Saying “I’m sorry” may reduce the insult, but the effects are lasting. The same is true for emotionally satisfying and pleasing remarks. So make sure you apply these principles to increase the effectiveness of your interpersonal messages.

## 1.7 Guide to Interpersonal Communication<sup>31</sup>

As new advances in engineering have occurred in the past quarter century, new ethical issues have arisen, as we frequently see in health care technology. The health care industry can now keep many people alive for a longer period of time, and people who would have died twenty[U+2011]five years ago can now be treated. Premature infants, heart attack victims, and other individuals can now be treated with new devices that prolong life. But new possibilities also raise ethical questions about who should receive benefits, who should pay for them, and when is it ethical to prolong life. Should a person who is being kept alive on by a machine and who has no chance of being returned to a state of health be permitted to die? At what birth weight should a premature infant be treated with unusually expensive equipment? Learning how to deal with ethical issues will be an important part of your engineering career. This summary can only touch the surface of the issues that lie ahead.

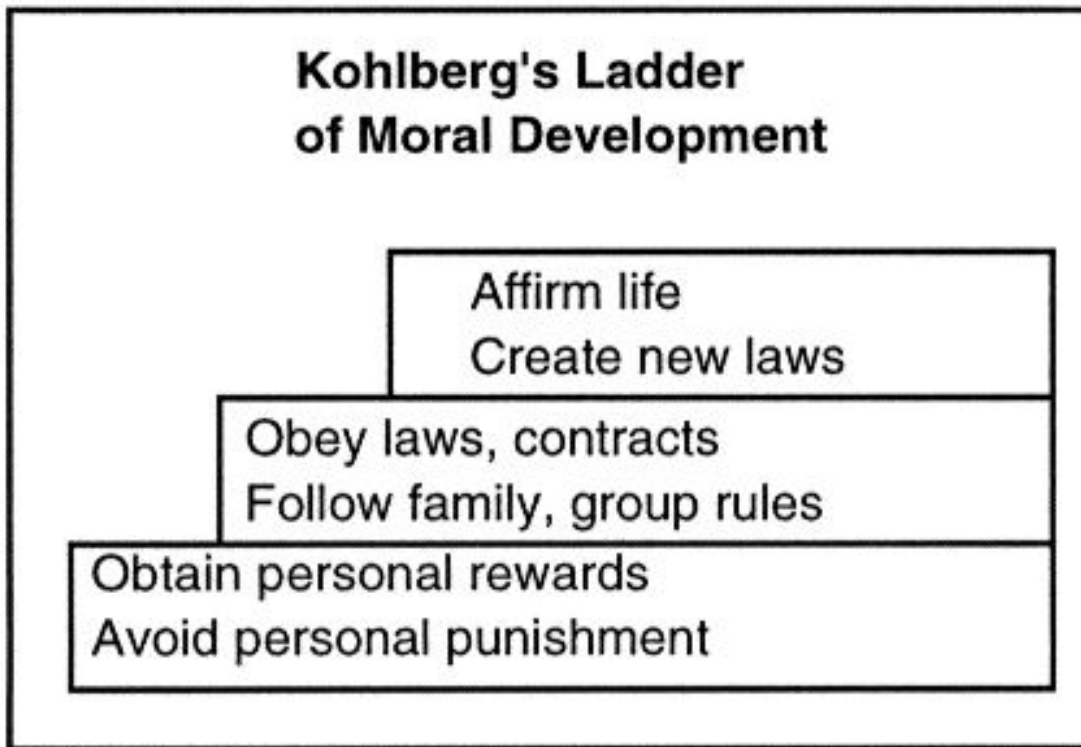
Reasons for ethical decisions include

- avoiding harm (something that includes both intentions and effects of actions)
- following ideals or standards
- and acknowledging the rights of stakeholders in a situation.

As engineers in the Ford Pinto case years ago discovered, avoiding harm must come before profit and other motives. Ideals address our highest conception of human behavior, such as compassionate sensitivity to others’ needs. The ideal standards for ethical behavior are both personal and private choices, because an individual’s ideals are in some senses his or her own choice, but engineering specialties also agree to follow specific codes of ethical practice, which commit each engineer to standards approved by all other engineers.

Some situations contain a **dilemma**, a problem to which all solutions are bad in one way or another. Lawrence Kohlberg’s theory of moral reasoning suggests six primary levels of moral reasoning that people learn sequentially as they grow up. Although a mature person may at times use different levels of reasoning, he or she will typically tend to argue at one level.

<sup>31</sup>This content is available online at <<http://cnx.org/content/m17129/1.1/>>.



**Figure 1.4:** Lawrence Kohlberg's Ladder for Moral Development

In the lowest two levels, a person is concerned principally about his or her own welfare. In levels one and two the person makes choices either to obtain rewards or to avoid harm.

For example, a young child may agree to behave in order to obtain a cookie or to avoid a spanking. In the next levels, three and four, the influence of a group is dominant. The older child is taught the rules of his or her family and the codes of small organizations such as a scout troop or school team. During the high school years, the laws of state and nation are learned and decisions are often based on contractual or legal requirements. Because an individual is guaranteed certain rights by the Constitution and by other legislation and ordinances, and because laws may create certain obligations or duties, the third and fourth stages of moral reasoning are called rule-governed.

The fifth and sixth levels are law creating levels. At the fifth level, new laws may be enacted to deal with new ethical problems, such as who can receive new and controversial treatments or who may have access to a new weapons technology. And at the sixth level, the concerns of many countries and peoples, the environment, and the future of the planet may be the top priority. So as one moves up the ladder, the reasoning is based on first, self-interest, then group interests, and finally, global interests. As you analyze specific cases, look for the levels of reasoning various participants choose.

Some of the ethical considerations embodied in different theories of ethical behavior include the **intent** of the person committing the action; the **consequences** of the action; and the ideal or standard prescribed by a group. Theories concerned with intent may judge an action ethical if the person did not intend harm to those affected. This theory would say that if an engineer intended to benefit the client, accidental side effects or bad outcomes are not the engineer's fault. Similarly, Shakespeare's Henry V tells a soldier that the

king is not responsible for a soldier's death in battle since in ordering them to fight, the king intends a good result and "purposes not their deaths." The soldier listening to the king argues from a different theory, one that judges ethical responsibility by **results**: if the outcome is bad, the deed is bad. Other theories weigh the agent's level of knowledge, saying that a person who knows more knowledge has a greater obligation than one who acts in ignorance. Acting against the knowledge that one should have had constitutes negligence.

All individuals, regardless of profession, are supposed to honor general human rights, those that individuals have by virtue of being born, such as the rights of life, liberty, and the pursuit of happiness. And each individual has certain duties, such as to fulfill contracts, to avoid lying, stealing, and cheating, and to avoid harm to others. Other rights people have by virtue of a protected status, such as being handicapped. Balancing rights and duties, pursuing ideals, and discovering the best use of engineering methods and resources will be an ethical challenge in your career.

All situations involve stakeholders [U+2011] [U+2011] people who have an interest in how the situation turns out. Stakeholders include third [U+2011] party payers (insurance companies), customers, vendors, hospitals, employees' families, employers, the media (newspapers, TV, and so on), the government, and other engineering professionals. Whose will should dominate in a decision: the insurance company's, the regulator's, the engineering company's, or the client's? The presence of many stakeholders complicates ethical decisions. All the people involved in a technology have a stake in who has access to it, who benefits by it, who controls it, and who pays for it.

When the nature of a hazard is ambiguous, engineers have to balance complex interests of many stakeholders. Learning more about ethics as you continue through your training as an engineer will greatly help you in communicating successfully with your clients, with other colleagues, and with politicians and the general public.

## 1.8 Presenting to Managers and Other Professionals<sup>32</sup>

This PPT slide show explains differences between academic and professional audiences, details some of the purposes and challenges of professional situations, and recommends ways of organizing talks and designing PowerPoint slides to deliver points concisely and convincingly.

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<http://cnx.org/content/m17117/latest/PresentToProfessionals.mov>

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**Figure 1.5:** Presenting to Managers and Other Professionals

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<sup>32</sup>This content is available online at <<http://cnx.org/content/m17117/1.2/>>.

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**Figure 1.6:** Please click on the above link to download the PPT file

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## 1.9 Guide to Communication and Corporate Culture<sup>33</sup>

### 1.9.1 What is corporate culture?

When you interact with clients or when you seek a job, pay attention to the organization's corporate culture. Corporate culture refers to the beliefs, attitudes, and values that the company's members share and to the behaviors consistent with them (/that they give rise to). Corporate culture sets one organization apart from another. Corporate culture dictates how members of the organization will see you, interact with you, and sometimes judge you.

Some aspects of corporate culture are easily observed; others are more difficult to discern. You can easily observe the office environment and how people dress and speak. In one company individuals work separately in closed offices; in others teams may work in shared environments. The more subtle components of corporate culture, such as its values and overarching business philosophy, may not be readily apparent, but they are reflected in the behaviors of the organization's members and in the symbols it uses. The following explanation briefly describes four types of corporate culture that you may notice in job interviews or business meetings.

### 1.9.2 Four types of corporate culture

In Corporate Cultures, First Name Deal and First Name Kennedy propose that the nature of a company's mission usually determines how two elements combine in the firm's typical transactions. The character of this combination strongly affects the type of culture the company evolves and acts upon. These two elements are 1) **the proportion of resources (principally money or people) committed to typical projects** and 2) **the length of time required for results to be known** (feedback time). Different combinations of these two factors produced four types of corporate cultures: 1) the bet-your-company-culture; 2) the macho or tough-guy culture; 3) the work hard/play hard culture, and 4) the process or bureaucratic culture. These types of culture also affect how individuals communicate and the communication features that are preferred or expected within the corporate/company environment. As an engineer acting as a consultant or employee, you can anticipate the need to adapt your communication style to these various environments.

- **Bet-your-company culture.** Bet-your-company culture is common among industries in which long-term projects require a high proportion of company resources, such as research and development or resource development costs. Examples include mining companies and real estate developers. Big projects are viewed seriously. Proposals for these projects are often lengthy and contain extensive analyses and appendices that will be reviewed by different types of experts. These companies follow

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<sup>33</sup>This content is available online at <<http://cnx.org/content/m17116/1.1/>>.



written agendas and communicate formally and seriously. Presentations are formal and “no nonsense.” Documents often have many appendices to back up recommendations.

- **Macho or tough-guy culture.** Macho or tough-guy culture is common in deals that involve big projects with relatively short-term feedback horizons. These projects usually depend on much shorter working documents plus long technical documents. Some property transactions may be done on a handshake followed up by legal contracts written by lawyers. Some communication events in this culture are dramatic (press conferences, bonus signings, and product introductions) while others are formal and not public. Civil and environmental engineers seldom work in these environments, which are more common in fields such as entertainment.
- **Work hard/play hard culture.** Work hard/play hard cultures emphasize meeting short-term deadlines, require high energy and lots of client contact, and usually involve only a fraction of the company’s resources in any one deal. Selling is usually the dominant activity of such firms. Success depends on the number of contacts made. Civil and environmental engineers are usually not part of this kind of firm, although some consulting firms provide short-term services where immediate deadlines, such as proposal submission deadlines or government applications, require rapid turnaround times. Such companies prefer to hire consulting firms that have a “can do” attitude and efficient processes. Keep such clients updated frequently, usually with e-mail.
- **Process or bureaucratic culture.** Bureaucratic cultures are common at all levels of government and among some big service companies such as hospitals, insurance agencies, and universities. Process cultures rely on forms, ritualistic formal reports, proposals, and policy statements. Many memos are written “to the file” as a kind of insurance policy in case a complaint is ever received. Since performance is judged by adherence to codes and procedures, recognition for the fulfillment of duties or instances of accomplishment may only be precipitated by a challenge. Documents that highlight compliance with expected structures and information are valued. Civil and environmental engineers often work in these cultures and can gain added recognition by calling attention to full compliance in every situation. Recognition that an engineer can be trusted to “do it right” demonstrates eligibility for leadership roles and promotion.

### 1.9.3 Adapting communication to a client’s corporate culture

As these brief descriptions indicate, clients’ expectations may vary significantly depending upon what type of corporate culture dominates. Students should analyze the type of culture that characterizes a given client company. As mentioned above, the proportion of resources and the feedback time affect many aspects of communication.

Once the client’s corporate culture has been identified, a student should adapt to the frequency, formality, and type of communication that is customary in that culture. This adaptation will strongly affect the client’s satisfaction and attitude toward both the engineering company and the individual student. It is common in industry for clients to request specific individuals as project managers if those individuals have previously demonstrated an awareness of “how the client likes things done.” Whenever an engineer acts as the liaison or the new business development contact, the ability to recognize and adapt to corporate culture have an impact on success. The following page contains specific suggestions for analyzing and adapting to a prospective employer’s or client company’s culture.

### 1.9.4 Checklist for adapting communication to a new corporate culture:

- What audiences will make the decision in this corporation on this issue? Will your document have to go up through several layers to get approval? If so, what are the criteria and values that may affect acceptance there? For example, is being on schedule the most important consideration? Cost? Quality?
- What type of communication is preferred? Do they want lengthy documents (“bet your company” or “bureaucratic” culture)? Is “short and sweet” the typical standard?

- What medium of communication is preferred? What kind of medium is usually chosen for this type of situation? Check the files to see what others have done.
- What vocabulary and format are used? What colors and designs are used? At Hewlett-Packard (HP), all rectangles have curved corners, for example.

### 1.9.5 Evaluating corporate cultures while seeking employment

Graduating seniors seeking a job should thoroughly research companies' corporate cultures. The following questions can be used in evaluating opportunities.

- Do the values stated in the company's mission match your own?
- Do the stories employees tell you about the company seem like narratives in which you would like to be a featured character?
- What behaviors characterize those who are successful at this company?
- What achievements earn rewards and promotions at the company?
- What opportunities will you have to learn through training or rotating assignments?
- Will the work you do help you to advance in your job at this company or in other companies? Will you have a chance to observe valued activities?
- How would you describe employee morale? Are they hiring because other employees are finding more compatible work environments elsewhere?
- What attitudes are expressed toward diversity and equal opportunity? If people like you do not occupy the kinds of positions to which you aspire, do you think you will succeed?
- What kinds of relationships does the company have with its community? What kinds of events does it sponsor? What activities does the company participate in?

Seek a company in which you will be able to support the organization's values.

### 1.9.6 Adapting communication to types of corporate cultures

Consider the following tips for adapting your ordinary communication practices when you interact with people who work in the four types of corporate cultures Deal and Kennedy describe.

#### 1.9.6.1 Bet-your-company culture.

In general, managers who work in a bet-your-company culture assume that if every small component of a project is well documented and thoroughly tested, the large project on which so much depends will succeed. That belief justifies preparing and expecting others to prepare well-supported arguments, no matter how small. Giving evidence of one's calculations, photocopies of sources, or appendices listing the articles you used in preparing a recommendation will generally not be amiss. You will be perceived as reliable, thorough, and trustworthy.

Second, mine files or management of change systems to explore how things are usually done. Following accepted patterns will convince others that you fit in, work as others work, and understand the system. See how others document their work or prepare information for others on the project. Follow the routine system of headings for routine communication. People will reward you for doing what is expected.

Use methods of communication and genres that your readers trust, or bring up problems with the method discretely to your manager. You might say, "I noticed that this is the way we've usually prepared this kind of report (showing your version A), but I wondered whether you might find this version more useful because it puts X in a more visible position, and it might be more convincing to have it there. Which one do you prefer?" Don't be surprised if A is chosen, even if the reader likes B. The conventions of a large, familiar system can be hard to change. Always argue on the basis of serving the purpose more effectively rather than on the basis of a flaw in the existing system.

Submit issues or questions to be put on the agenda well in advance so that the possibility can be discussed before the meeting occurs.

Argue in favor of your own points by linking them to values the organization endorses in its “values statement,” “quality control statements,” “vision for the new century,” and so on.

#### **1.9.6.2 Work hard/play hard culture.**

Since this culture fosters MANY transactions with short-term time horizons, expect many routine communications, time-saving modes such as e-mail and instant messaging, and pre-established forms (many of them on-line). Write short requests and proposals backed up with the essential information, not reams of data or analysis. Use “bottom-line” principles: put the main point early and the action request early. Unless the request is totally unorthodox and must be argued for in detail, use one-page memos and short e-mails. Expect short sentences in return: “I approve.” “Not really.” “Review at Sat. meeting.” Lots of your colleagues may be using Blackberries, and thumbing a long message is tiresome. Some symbols may replace words, too.

Replying promptly will earn favor. Check your e-mail often, and do it as soon as you hit the office (and perhaps after you return home as well). Not reading your messages will probably ruin your reputation or at least dent it. Responding promptly will be taken as evidence of your commitment to the group.

Expressions of commitment, eagerness to work, and dedication to customer or client services will probably be appreciated. Slang expressions, however, are not good because these will necessarily remain in the file for seven years or so (legal requirements), and later on the slang will look dated and out of touch. Long appendices and reports will not be appreciated.

#### **1.9.6.3 Macho or tough-guy culture.**

If you join a company in this group, such as a start-up entrepreneurial firm or an entertainment or public relations firm that engages in big deals, you will probably not be one of the big players at the beginning. You’ll probably be in the background preparing the support documents for projects, but if you are involved in the press conferences, negotiation meetings, or proposals for clients, remember that high levels of enthusiasm are expected in combination with concern for exact follow-through. Being on time or ahead of the “needed by” date with easy-to-use cover sheets that call attention to the key points or purposes of the attached documents will win credit/approval. Don’t overload people who have large responsibilities with lots of e-mails or requests, and be attentive to their needs as deals or projects progress.

#### **1.9.6.4 Process or bureaucratic culture.**

Find out what forms are used for which purposes. Sending even crucial information on the wrong form may cause it to be overlooked or ignored by those who see the communication as “not meant for them.” On-line forms and elaborate/standardized systems of documentation are characteristic of this culture. In a bureaucratic culture (think libraries, insurance companies, banks, and universities), it is sometimes more important to follow the right procedure than to have the right information or the right answer.

Make your paragraphs and answers easy to read, nonetheless. Bureaucratic institutions may be understaffed, and even though their employees like tremendous amounts of documentation, they are usually short of time and object to being overworked with long explanations. Adding a post-it note that says you followed all the steps in the policy manual, or adding a note to answer a question or support the quality of your information will probably win you a nod of appreciation.



## Chapter 2

# Project Risk Management

### 2.1 Leveraging with information technology: What is IS Risk Management<sup>1</sup>

The IS risk is the business risk associated with the use, ownership, operation, involvement, influence and adoption of information/technology solutions (Application, Hardware, Network and People) within an organization. IS risk consists of IS-related events that could potentially impact the business. It is also the management of uncertainty within the functions of IS so as to provide the organization with assurance that:

- the possibility of a threat occurring is reduced or minimized, and
- the impact, direct and consequential, is reduced or minimized.

To provide this assurance, threats must be identified and their impact on the organization evaluated so that appropriate control measures can be effected to reduce the possibility or frequency of a threat occurring and to reduce or minimize the impact on the business.

Information is a key business resource which, in order to be of value, must be correct, relevant and applicable to the business process and delivered in a timely, consistent and usable manner; it must be complete and accurate and provided through via the best use of resources (planned or unplanned), and if sensitive it must have its confidentiality preserved. Information is the result of the combined application of data, application systems, technology, facilities and people. IS Risk Management ensures that the threats to these resources are identified and controlled so that the requirements for information are met.

#### 2.1.1 Project management risks

Despite the fact that sound system design and installation methodologies have been well known for decades, the IT profession is still plagued by troubled or failed projects, colloquially called “an Ox in the ditch.” Studies like the Chaos Reports published by the Standish Group over the years have documented the extent of IT project successes and failures. For example, the latest publicly available report, “CHAOS Summary 2009,” states:

*"This year's results show a marked decrease in project success rates, with 32% of all projects succeeding which are delivered on time, on budget, with required features and functions" says Jim Johnson, chairman of The Standish Group, "44% were challenged which are late, over budget, and/or with less than the required features and functions and 24% failed which are cancelled prior to completion or delivered and never used."*

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<sup>1</sup>This content is available online at <<http://cnx.org/content/m35517/1.4/>>.

"These numbers represent a downtick in the success rates from the previous study, as well as a significant increase in the number of failures", says Jim Crear, Standish Group CIO, "They are low point in the last five study periods. This year's results represent the highest failure rate in over a decade" (Standish 2009). So, you have to be aware of figure like these before you give the go-ahead for an IT project. Failed IT projects can be disastrous to an organization, even forcing them to go out of business.

Some of the reasons IT projects fail are:

- An inadequate understanding of what functions and features (i.e. requirements) the organization needs in the new system. It would be like trying to build a building before its design has been completed.
- Poor project planning, task identification, and task estimation. Usually this means that essential tasks have been overlooked or under-estimated meaning the project's time and cost estimates are too optimistic.
- Lack of proper skills on the project team. This would be like assigning carpentry tasks to an electrician. Some IT professionals think they can do anything and this is almost always not true.
- Failure to address problems and/or no project champion. Just about every IT project has problems. If they are not dealt with on a timely basis they don't go away by themselves, they just get worse. It is helpful in addressing problems if a highly-placed executive is a "champion" of the project and can step in and get problems solved if the project team is struggling.
- Inadequate testing. All too often, a new system is put into operation before it has been adequately tested to be sure it handles all conditions it is likely to encounter. A system failure after conversion can cause normal business processes (like accepting customer orders, for example) to fail.
- No fall-back plan. Before converting to a new system, the project team should have a tested fall-back plan they can revert to in order to keep business processes working while the new system is adjusted.
- Executive champions should be aware that IT project risks are all too often known to the IT professionals but are not always shared with others. Therefore, you should always ask that a formal project risk assessment be done at the beginning of a project and that plans are in place to keep risks at a minimum.

### 2.1.2 Security risks

The biggest challenge companies' face in tackling IS security risks is the growing sophistication of hackers and other cyber-criminals. Organizations must now contend with a range of hi-tech attacks orchestrated by well-organized, financially-motivated criminals. While large organizations often have independent IS security staffs, it is likely that your start-up can focus on just a couple of basic items, such as:

- Identifying the value of information stored on your computer(s) and making sure that access to such information is restricted to employees who need to use for legitimate business purposes. For example, your customer database and customer profitability analyses should be protected as you would not want such information to fall into the hands of a competitor as the result of actions taken by a disloyal employee.
- Computers sometimes break down ("crash"). This is why it is important to have a procedure of backing up critical files on a daily basis, and have written, tested procedures to recover needed information from backup files quickly. Organizations have gone out of business as a result of failed computer systems that were not properly backed-up.

If you have a website, you will need to be sure that it is adequately protected from both internal and external threats. We discuss Internet risks in the next section.

### 2.1.3 Internet risks

Companies considering a web site or Internet-based services need to be aware of the various risks and regulations that may apply to these services. Over the past few decades, the Internet has become critical to

businesses, both as a tool for communicating with other businesses and employees as well as a means for reaching customers. Each day of the week and every month, there are new internet threats. These threats range from attacks on networks to the simple passing of offensive materials sent or received via the internet. The risks and particular regulations that apply may vary depending on the types of services offered. For example, Institutions offering informational websites need to be aware of the various consumer compliance regulations that may apply to the products and services advertised online. Information needs to be accurate and complete to avoid potential liability. Security of the website is also an important consideration. Companies and some individuals traditionally have relied on physical security such as locks and safes to protect their vital business information now face a more insidious virtual threat from cyber-criminals who use the Internet to carry out their attacks without ever setting foot in an establishment or someone's home. More often than not, these crimes are conducted from outside the United States. Security measures should protect the site from defacement and malicious code.

It is clear that no single risk management strategy can completely eliminate the risks associated with Internet use and access. There is no one special technology that can make an enterprise completely secure. No matter how much money companies spend on cyber-security, they may not be able to prevent disruptions caused by organized attackers. Some businesses whose products or services directly or indirectly impact the economy or the health, welfare or safety of the public have begun to use cyber risk insurance programs as a means of transferring risk and providing for business continuity.

#### 2.1.4 Summary of IS risk management

Managing IS Risk is a daily decision making process aimed at reducing the amount of losses and threats to a company. It is a pro-active approach to reducing ones exposure to data/information loss and ensuring the integrity of the applications used day-to-day. An IS security plan should include at minimum a description of the various security processes for specified applications, procedural and technical requirements, and the organizational structure to support the security processes. A risk assessment should be performed first. Identifying risks provides guidance on where to focus the security requirements. Security requirements and controls should reflect the business value of the information assets involved and the consequence from failure of security. Security mechanisms should be 'cost beneficial', i.e., not exceed the costs of risk. It should also include what is expectable for risk within the overall IS security plan

## 2.2 Risk Assessment in Disaster Management<sup>2</sup>

Objectives:

- To become acquainted with high risk and special populations in disaster management

- To raise awareness of diversity issues in disaster management

We learn why vulnerability matters in disaster management and gain an overview of the different schools of thought that have formed the field of disaster management. We consider the definition, scope, and measurement of hazards risk and pay particular attention to high risk and special populations, including displaced people (refugees), ethnic minorities, economically disadvantaged populations, children, and the elderly.

### 2.2.1 Example 1

#### 2.2.1.1 Linda Davis

**Description of Principle:** "The patterns of everyday life put certain people at greater risk from disasters than others" (Gillespie, 2010, p. 3)

**Justification:** This principal is exceedingly important because only when we understand what puts individuals and groups at risk during a disaster can we begin to find ways to reduce the risk and prepare an

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<sup>2</sup>This content is available online at <<http://cnx.org/content/m40282/1.2/>>.

appropriate disaster response. For example, “in disasters, low-income households are highly vulnerable because of less insurance protection, older housing, and fewer material resources for recovery” (Zakour & Harrel, 2003, p. 28). By having an understanding of the various risks, social workers and others involved in disaster management can focus their efforts on minimizing the risks and providing resources for those most directly affected by the disaster. Likewise, understanding about vulnerability “increases the capacities of responders by delegating authority to the local level, avoiding overly stringent bureaucratic operating procedures, encouraging self-reliance among the affected population, improving decision making in crisis situations, and discouraging the creation of dependency through well-intentioned but sometimes counterproductive relief operations” (McEntire, 2004, p. 27).

**Social Work Relevance:** Part of the work of social workers is serving those who are most vulnerable within our community. This professional emphasis must extend to the area of disaster management. The social work profession is “committed to serving vulnerable populations at risk for social and economic disadvantage, including exposure to hazards in the social and physical environment” (Zakour & Harrel, 2003, p. 28). Discovering the patterns of vulnerability helps social workers be better prepared for their jobs, because “social workers who understand those patterns are better able to direct and manage scarce resources” (Gillespie, 2010, p. 3).

**Related Definitions:**

Vulnerability: the degree of internal risk in a society in relation to the level of resilience of those societies or communities in danger (Zakour, 2010, p. 16)

Distributive Justice: the condition in which all populations in a community, and all communities in a society, have equal access to resources and capacity needed for overall well-being and resilience in the face of adversity (Zakour, 2010, p. 17)

Physical environment: the natural, built, or technological environment (Zakour, 2010, p. 17)

Social environment: the social organization of a community or society, with an emphasis on the psychological and cultural characteristics of a social organization (Zakour, 2010, p. 17)

Risk: the effects of environmental liabilities on the physical structures and assets of a community (Zakour, 2010, p. 18)

Resilience: the ability of a social system such as a society, community, group, or household to recover or bounce back after a disaster (Zakour, 2010, p. 18)

**Illustrations:**



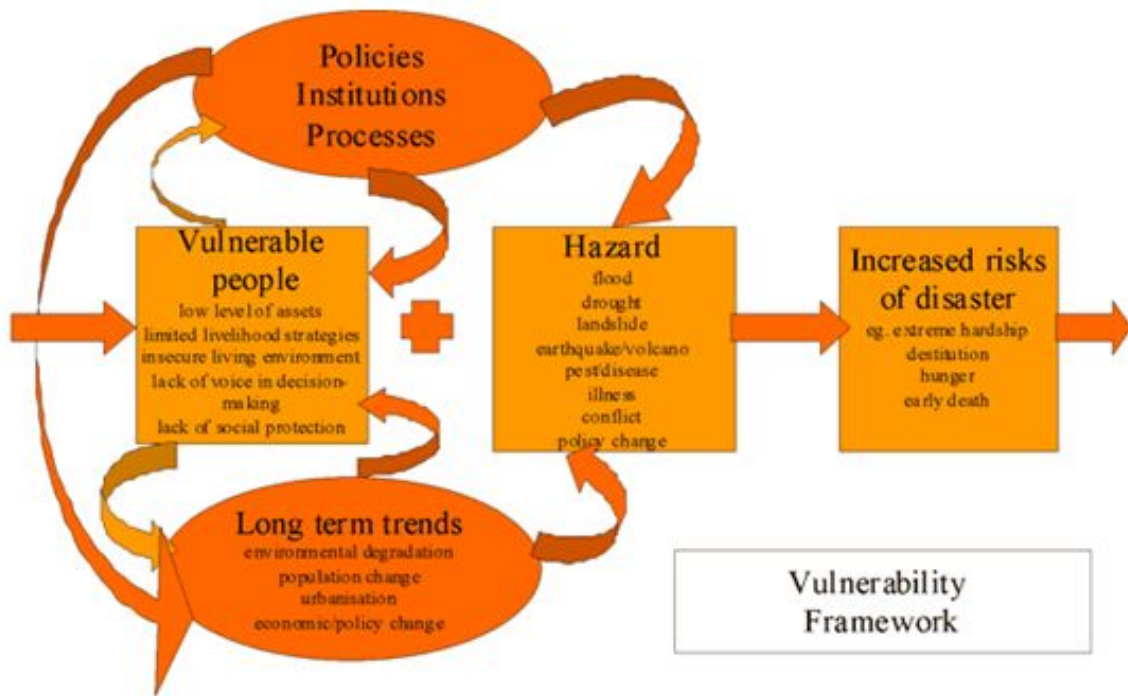


Figure 2.1

This diagram shows how a vulnerable population, such as one who has a low level of assets, can have an increased risk when it is presented with a disaster. Policies, Institutions and Processes, as well as long term trends, can either increase or decrease a groups' vulnerability.

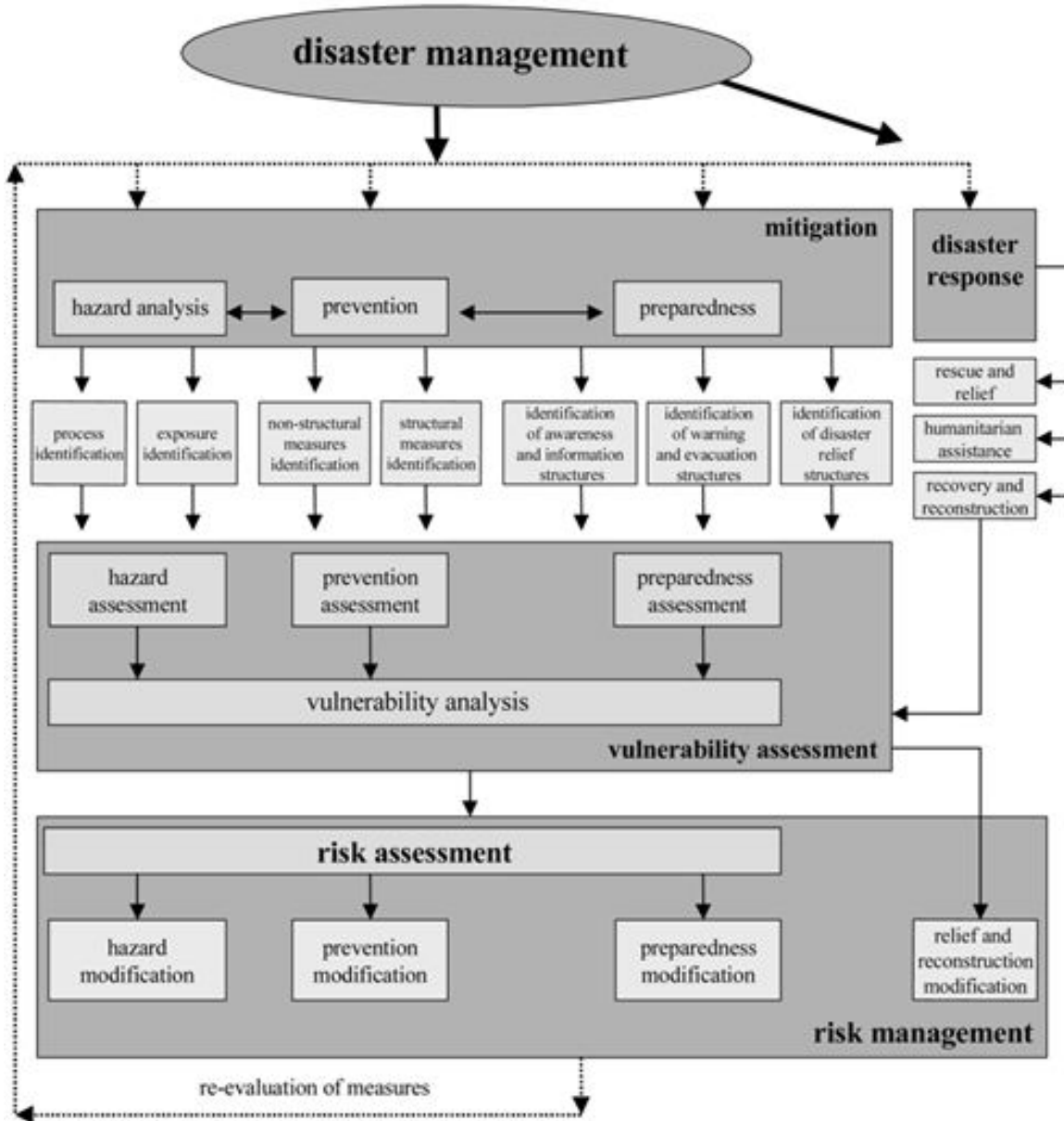


Figure 2.2

This model shows how a risk assessment and vulnerability analysis can be used to help mitigate and respond to a disaster.

## 2.2.2 Example 2

### 2.2.2.1 Brodie Mueller

**Principle:** Vulnerability is the product of many variables. (McEntire (2004). Tenets of vulnerability: An assessment of a fundamental disaster concept. *Journal of Emergency Management* 2 (2), Pp. 23-29. (pg 24)

**Justification:** If we could pin vulnerability down to one thing, like location or government structure, we could fix it easily and therefore prevent many more disasters to vulnerable populations. However, each community and each family in those communities have their own unique sets of vulnerabilities.

**Social Work Relevance:** This is important to social work for many reasons. First, we need to be sensitive to the fact that many families may have many conditions that make them vulnerable, and may not be aware of all of them. Because of this, we as social workers need to look at each situation and see the family in their environment with its hazards. We also need to be understanding and teach people about their hazards, as they may not know they are vulnerable, and educate them on how to be safer.

**Definition:** Vulnerability - Ratio of risk to susceptibility. (Gillespie (2010). *Vulnerability: The central concept of disaster curriculum. Disaster Concepts and Issues.* Pp. 3)

**Illustration:**

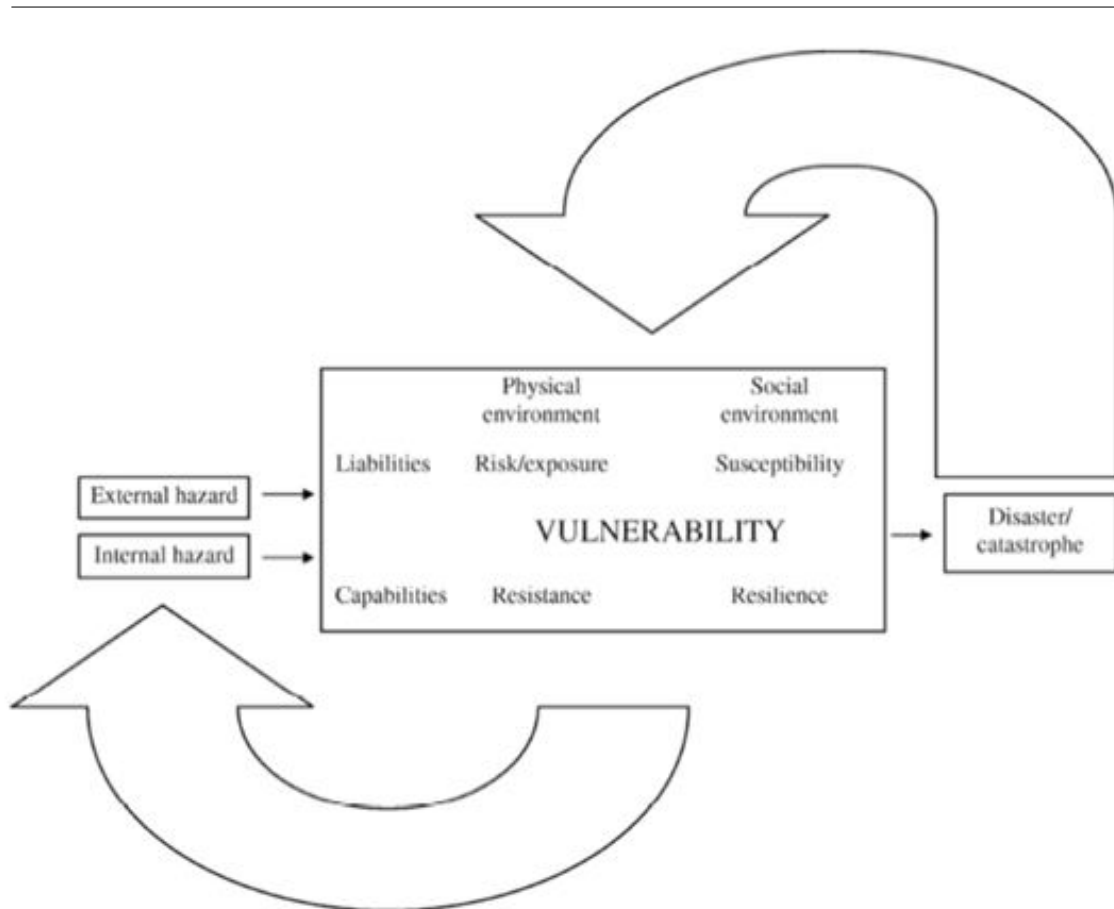


Figure 2.3

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## 2.3 Ethical Issues in Risk Management for Business<sup>3</sup>

NOTE: These links will help you to explore different topics related to this module's contents.

- Epidemiological studies are "natural" experiments. But allowing naturally occurring harms to continue without abatement and withholding information from risk bearers creates serious ethical problems. Read the Tuskegee case as presented at the Western Michigan University Ethics Center to learn about a notorious case in which patient rights were egregiously violated for the sake of "continuing the experiment."

- Risk has meaning only in relation to the socio-technical system in which it operates. Click on the link above to find out more about STS analysis and how it can be used to anticipate problems.

- Informed consent is a fundament right in the responsible management of risk. Click on the link to the Belmont Report to find out more about this right and its historical importance.

- The Online Ethics Center's definition of informed consent includes the conditions necessary for fulfilling this right.

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### Word Version of this Template

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This is an unsupported media type. To view, please see [http://cnx.org/content/m19085/latest/EAC TK STD TEMPLATE.doc](http://cnx.org/content/m19085/latest/EAC_TK_STD_TEMPLATE.doc)

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**Figure 2.4:** This is an example of an embedded link. (Go to "Files" tab to delete this file and replace it with your own files.)

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### 2.3.1 Introduction

#### Tilting at Windmills in Puerto Rico

The company, Windmar, has purchased land adjacent to the Bosque Seco de Guanica in Puerto Rico. Their plan is to build a small windmill farm to generate electricity that can be sold to the public utility, the Autoridad de Energia Electrica. Windmill technology is considered desirable because wind is an abundant, clean, and renewable resource. But local opposition has stalled this effort. Concerned citizens object, first of all, to being excluded from the public hearings that were held to assess Windmar's windmill project. Opponents also claim that windmill technology can kill birds on the endangered species list and damage the fragile ecosystems protected in the Bosomeco de Guanica, an important nature preserve in Puerto Rico. They also suspect that the windmill project has the ulterior motive of attracting industrial development

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<sup>3</sup>This content is available online at <<http://cnx.org/content/m19085/1.1/>>.

into southern Puerto Rico. What risks accompany windmill technology, and how can they be dealt with ethically?

### **The real price of cell phones**

Recently, a series of microwave antennas have been built in Puerto Rico in the Atalaya hills between the western cities of Mayaguez and Moca. Different kinds of antennas serve different purposes; some provide citizens with cell phone service while others make it possible to track hurricanes and other weather developments. The problem is the impact on the people who live in the surrounding areas. Many antennas have been built within five hundred yards of private residences with some as close as one hundred yards. Local residents were not consulted when the decision was made to build them. They claim that they have suffered a disproportionate number of health problems caused by the EMFs (electro-magnetic fields) generated by the antennas. Construction and repair activities occur at all hours, day and night, disrupting sleep and other normal activities. How should the cell phone companies, government agencies, and other stakeholders respond to these health and safety concerns? How should the possible risks to health and safety associated with antennas be assessed and communicated?

### **No Copper Mines in Puerto Rico**

Starting in the mid-1950's, several international mining companies have attempted to receive permission from the Puerto Rican government to construct mines for gold and copper. Orebodies located in the mountainous central region of the island, have attracted several proposals for mining projects ranging from large to small scale. Concerns about **water pollution** (produced by tailings or mining waste products), **air pollution** (accompanying the proposed copper smelting plants), and **disruption of the agrarian lifestyle** still alive in central Puerto Rico became focused into considerable political and environmental opposition. Several mining proposals were defeated as citizens' interest groups formed and intensively lobbied the government not to permit mining. One mining site, located in the Cala Abajo region, has been reclassified as a nature preserve to block further attempts at mining. Mining could benefit the areas around the proposed mining sites by generating much needed jobs and tax revenue. But these benefits come accompanied by increased risks to the environment as well as public safety and health. How should these risks be assessed? Under what conditions, if any, could they be deemed acceptable? What processes should be set into place by the government to ensure adequate public participation in determining whether these risks are acceptable? How should risk information be communicated to a public which is isolated and still largely illiterate?

### **"No" to the Coal Plant**

In the early to mid-1990's, a consortium of U.S. and Spanish power generation companies proposed an electricity-generating plant for the Mayaguez area that employed co-generation technology fueled by coal. Not only would this privately owned plant sell the electricity it produced to the Autoridad de Energia de Electrica; it would also sell the steam by-product to the two local tuna canning plants that had been operating in the area since the 1960s. But local opposition arose to derail the project. Coal is a non-renewable resource that produces noxious by-products that contribute to acid rain and global warming. Geologists pointed out that the plant would be located dangerously close to an active earthquake fault. Environmental groups raised concerns about water pollution, especially further deterioration of the already endangered coral reef in the Mayaguez Bay due to the discharge of the heated water employed to cool the components of the proposed plant. In televised public hearings, company engineers testified on design modifications to keep endangered species such as manatee from being sucked into the plant through water intake pipes. On the other side of the debate, the Puerto Rico energy utility, the Autoridad de Energia Electrica, predicted energy shortages beginning around the year 2000. (These warnings have been vindicated by the frequent brown-outs and black-outs that residents currently suffer through.) They also argued that the western part of the island needed its own energy-generating facilities to hold onto crucial industries like the textile and tuna canning plants located in the area. Finally, they turned to the use of coal to generate electricity as an effective substitute for petroleum which is used to generate most of the electricity used by Puerto Ricans. Since the rejection of the project, the textile industry has all but disappeared and one of the two tuna canning plants has relocated to Taiwan. Can government play the role of "honest broker" between private industry and a suspicious public? Should public utilities contract with private industry to meet energy and other infrastructure needs? What are the environmental risks of co-generating technology? How can these

be responsibly communicated to the public? How should all stakeholders weigh environmental, safety, and health risks against infrastructure expansion and economic development?

### **Ethical Issues in Risk Management for Business**

Each of these cases raises risk issues that cannot be settled by process alone but require substantive debate focusing on the fragile ethical values embedded in the surrounding socio-technical system. The stakeholders have at times worked together but more often engage in conflict over seemingly incompatible yet essential interests. Private industry has designed these projects to respond to real, market-based needs. For example, Puerto Rico desperately needs clean, renewable and sustainable sources of energy to protect its fragile environment and reduce its dependency on foreign oil. Yet other stakeholders, especially a public with complex and vital interests, have banded together to oppose these and other initiatives. Local residents demand a right to a livable environment, raise health and safety concerns, and assert civil rights based on distributive justice, free and informed consent, and due process. Past experiences with ambitious but poorly designed and executed business and government projects have consumed social capital and undermined public trust. Continuing development under these conditions has proven difficult. The Puerto Rican government has consistently been in the middle attempting to mediate between these contending parties. Can government play the role of "honest broker" and help lead conflicting stakeholders to political and social consensus? Can government lead the substantive ethical debate into applications of distributive justice, informed consent, and sustainable environmental value? Or should it step out of the way and let the public and private industry fight it out on their own? What role do free (or semi-controlled) markets have to play in mediating this conflict? This module will help you explore these problems through the prism of risk. You will study the different aspects of risk and learn about their ethical and social implications. The final objective is to help you manage risk ethically through responsible assessment, perception and communication.

### **2.3.2 What you need to know . . .**

Working responsibly with risk requires careful integration of substantive ethical issues, distinguishing different senses of risk, and mastering the skills required in morally responsible risk communication. In other words, it is more than just implementing a mechanical process that imposes unwanted consensus on disparate groups and individuals. (See Sandel for an argument that past ethical controversies such as slavery had to be settled by means of substantive debates rather than procedural maneuvers.) Ethics is important to risk because scientific risk assessment is value-laden. Values permeate decisions such as choice of method as well as decisions on how to distribute the burden implied by the uncertainty involved in risk assessment and management. This section will introduce you to basic moral concepts involved in risk and offer information on how risk is assessed, managed, perceived, and communicated.

#### **Responsible Risk Management: Associated Basic Moral Concepts**

1. **Right:** A capacity of action that others are obliged to recognize and respect. A key right in the context of risk is free and informed consent. (See below)
2. **Duty:** The obligation to recognize and respect the essential capacities of actions of others. Duties are correlative to rights. For example, the duty to avoid paternalism in the management and communication of risk is correlative to the right of free and informed consent.
3. **Virtue:** Responsible risk management can also be formulated as a virtue. Virtues are traits that extend "deep down" into an individual's character. They include an orientation toward excellence in decision and execution, perceptual sensitivities that help to uncover moral relevance, and emotions/attitudes that help motivate decisions and actions oriented toward achieving excellence. For example, a responsible risk communicator has curiosity that drives understanding and appreciating risk, a concern for the well being of the risk bearer, and a strong desire to communicate risk information truthfully and clearly.
4. **Justice:** Justice can be generally defined as giving each his or her due. Distributive justice, in the context of risk, prescribes a fair distribution of the benefits and harms associated with taking a certain risk. Ideal pattern approaches argue that distribution should conform to a pattern such as **equality** (equal shares to everyone), **need** (greatest share to those with the greatest needs), and

**merit** (greatest share to those who demonstrate superior merit). **Ideal pattern approaches** require continual redistribution by government through measures such as a progressive income tax. **Historical process approaches** prefer maintaining current patterns of distribution provided the historical process leading to them has been free of force or fraud. Justice in the context of risk lies in determining how the benefits and harms associated with risk are distributed, and how the uncertainty that permeates the risk assessment and management process is distributed among those involved.

5. **Responsibility:** Herbert Fingarette defines responsibility (in the context of criminal insanity) as (moral) response to (moral) relevance. Different senses of responsibility include causal, legal (vs. moral), role, capacity, and blame. Responsibility can be reactive when it focuses on the past and the assigning of praise and blame; or it can be proactive when it turns to preventing harm (minimizing risk) and realizing value.
6. **Trust:** The expectation of moral behavior on the part of others. Trust is built out of the social capital accumulated through successful interactions with others. It is consumed or undermined by those who choose to free ride on social cooperation, i.e., compete while others are cooperating. The prisoner's dilemma (see link above) provides a simplified model to show the fragility of trust (m17367).

### Key Terms in Risk Practices

1. **Safety:** "A thing is safe if, were its risks fully known, those risks would be judged acceptable in light of settled value principles." (IEE 108)
2. **Risk:** "A risk is the potential that something unwanted and harmful may occur." (IEE 108)
3. **NIMBY:** This acronym stands for "Not in my backyard." Citizens often find the risks associated with a project or product acceptable only if these are located somewhere else, i.e., in another person's backyard. NIMBY has made it next to impossible for the U.S. DOE (Department of Energy) to find an acceptable permanent storage facility for nuclear waste.
4. **Free and Informed Consent:** The right to decide if a risk is acceptable based on access to pertinent information and absence of compulsion. The **Belmont Report** defines informed consent in the following way: "[that] subjects, to the degree that they are capable, be given the opportunity to choose what shall or shall not happen to them. This opportunity is provided when adequate standards for informed consent are satisfied." The Online Ethics Center spells out conditions necessary for fulfilling informed consent: (a) **disclosure** (of information to the patient/subject); (b) **comprehension** (by the patient/subject of the information being disclosed); (c) **voluntariness** (of the patient/subject in making his/her choice); (d) **competence** (of the patient/subject to make a decision); and (e) **consent** (by the patient/subject).
5. **Paternalism:** Often experts are tempted to act as overly concerned parents and take over the decision-making prerogatives of the public because they (the experts) "know better." Paternalism, while well motivated, is based on the misconception that the public doesn't understand risk because it often reaches different conclusions on the acceptability of a given risk than the expert. But the public often appreciates risk from a broader, richer standpoint, especially if the expert has properly and clearly communicated it. As will be seen below, the public perception of risk is rational because it is predictable.

### Dimensions of Risk

- **Risk Assessment:** The process of determining the degree of risk associated with a certain product or process using scientific methods such as epidemiological study or animal bioassay. While using scientific procedures to gain a measure of exactness, risk assessment still brings with it a remainder of uncertainty that cannot be eliminated. A risk assessment issues into two uncertainties, the uncertainty as to whether the harm will occur and the uncertainty as to who (out of the many exposed) will be harmed. Ethics enters into the picture as stakeholders negotiate how to deal with and distribute this uncertainty. Responsible risk practice requires integrating the conflicting values and interests of the involved stakeholders in assessing, communicating, perceiving, and managing risk. It also requires a

basis of trust that is difficult to build up given the diverse players that make up the risk taking and bearing situation.

- **Risk Management:** The political/social/ethical process of determining if a risk of a certain degree is acceptable given the settled value principles generally held in the community of the risk bearers. Responsible risk management requires (a) assessing harm through the responsible exercise of scientific method and (b) communicating the assessed risk to those likely to bear it. Responsible risk management (i) honors rights such as free and informed consent and due process, (ii) avoids conflicts of interests in determining and communicating risk, (iii) conscientiously works toward a just distribution of risks and benefits, and (iv) avoids paternalism.
- **Risk Perception:** How people perceive risk differs from the strict, scientifically determined degree of risk. For example, risk perception factors in voluntariness, control, expected benefits, lack of knowledge, and dread of adverse consequences in working toward a judgment on the acceptability of a given risk by the community of risk bearers. Because the public perceives risk over this broad background of scientific, social, political, and ethical factors, it frequently arrives at conclusions at odds with judgments reached using strictly scientific methods. Those taking a paternalistic attitude toward the public take this difference as evidence of the irrationality of the public and the need for the experts to taken things into their own hands. However, the public attitude toward risk is intelligible and rational when this broader, risk perception perspective is taken into account.
- **Risk Communication:** This dimension focuses on how to communicate risk information to risk bearers in order to facilitate distributive justice, free and informed consent, and due process. Responsible risk communication requires translating scientifically determined information into a non-technical vocabulary. Analogies and comparisons help as does the use of concrete language and commonly understood images. But improper use of comparisons and analogies confuses the public and undermines trust.
- **Public:** “those persons whose lack of information, technical knowledge, or time for deliberation renders them more or less vulnerable to the powers an engineer wields on behalf of his client or employer” Davis

### Assessing Risk

- **Epidemiological Studies:** We are constantly exposed to different risks that have become inherent in our socio-technical circumstances. These ongoing, unintentional experiments are exploited through epidemiological studies which are designed to measure the correlation between exposure to risk factors and the occurrence of harm. For example, are those living close to EMFs (electro-magnetic fields generated by technologies like electrical power lines) susceptible to certain harms like leukemia? An epidemiological study would compare incidents of this disease occurring in a population exposed to EMFs with incidents of this disease occurring in a population, unexposed to EMSs. If there were a significant risk ratio (usually set at three times the incidents of the harm in the unexposed, control group) then this provides evidence that exposure to EMFs somehow causes leukemia. (Further study would be required to confirm this hypothesis and uncover the causal mechanism by which exposure produces the harm.) Epidemiological studies are difficult to carry out and are always accompanied by uncertainty due to the limitations of the methods employed. Typically, the harm may take years to become manifest after exposure. Finding a population stable enough to determine the effects of long term exposure is difficult because individuals frequently move from place to place. Such natural experiments also bring with them a great deal of "noise"; factors other than EMFs could be causing leukemia or EMFs could be interacting with other elements in the environment to cause the harm. Finally, there is the Tuskegee factor. In the notorious Tuskegee experiment, doctors refused to treat African Americans for syphilis in order to study the long term progression of the disease. Exposing a population to a risk factor without informing them of the potential harm in order to gain scientific information violates the right of free and informed consent and the duty not to harm.
- **Animal Bioassays:** Risk information can often be obtained by exposing animals to the risk factor and checking for emerging harms. While useful, animal bioassays are subject to several problems. Experimenting on animals raises many of the same ethical concerns as experimenting on humans.



Utilitarians argue that animals merit moral consideration because they are sentient and can suffer. Animal experiments are thus subject to the three Rs: reduce, refine, and avoid replication. (See Bernard Rollins) Second, these experiments create two kinds of uncertainty. (a) Projections from animal to human physiology can lead researchers astray because of the differences between the two; for example, animals are more sensitive to certain harms than humans. (b) Projecting the results from intensive short term animal exposure into the long term can also introduce errors and uncertainty. Thus, as with epidemiological studies, there are uncertainties inherent in animal bioassays.

- Risk assessment, while useful, is burdened with uncertainty due to the limits of what we know, what we can know, and what we are able to learn within the ethical parameters of human and animal experimentation. Crucial ethical issues arise as we decide how to distribute this uncertainty. Do we place its burden on the risk taker by continuing with a project until it is proven unsafe and harmful? Or do we suspend the activity until it is proven safe and harm-free. The first gives priority to advancing risky activities. The second gives priority to public safety and health, even to the point of suspending the new activities under question.

### Risk Perception

- The framework from which the public perceives risk is broader and richer than that of risk assessment. The following five factors influence how the public judges the acceptability of a risk assessed at a given magnitude.
- **Voluntariness:** A risk that is voluntarily taken is more acceptable than a risk of the same magnitude that taken involuntarily. Thus, driving one's car to a public hearing on the risks of a proposed nuclear power plant may be riskier than living next to the plant. But driving to the public hearings is done voluntarily while living next to the plant is suffered involuntarily. According to studies, a voluntary risk is as much as 1000 times more acceptable than an involuntary risk of the same magnitude.
- **Control:** Closely related to voluntariness is control. A risk under one's control (or under the control of someone trusted) is more acceptable than a risk of the same magnitude that is not under control. Charles Perrow, in **Normal Accidents** argues against nuclear energy technology because its design allows for components that are tightly coupled and interact with nonlinear patterns of causality. These two characteristics make it possible for small events to start chain reactions that issue into large scale disasters. Because these small events cannot be isolated (they are "tightly coupled") and because they interact unpredictably (they display nonlinear causality), they escape control and lead to unacceptable risks.
- **Perceived/Expected Benefits:** A risk of a given magnitude is more acceptable if it comes accompanied with substantial expected benefits. One takes the risk of driving to the hearings on the proposed nuclear plant because the benefits of getting crucial information on this project outweigh the risks of having a car accident. Riding a motorcycle is a risky venture. But the benefits received from this activity in the form of enjoyment make the risk more acceptable than a risk of the same magnitude accompanied with less benefits.
- **Unknown Factors:** A risk that is not understood is less acceptable than one that is well understood. Riding a bicycle is a risky venture but, because its risks are well known, it is more acceptable than other activities accompanied by risks of similar magnitudes. This factor is highly pertinent to EMFs (electro-magnetic fields). While EMFs are associated with certain illnesses like leukemia, their effects are not well known and are not understood by the public. This unknown element makes living near EMF producing technologies less acceptable.
- **Dread Factors:** A risk may be known and its causal relation to certain illnesses well understood. Nevertheless it may be less acceptable because the condition it causes is one that is highly dreaded. EMFs, because they have been associated with leukemia in children, are much less acceptable because of this "dread factor." The causes of radiation sickness are well known as are the stages of the illness. But because this kind of illness is highly dreaded, accompanying risks are less acceptable than other risks of the same magnitude with less of the dread factor. Again, compare crashing on a bicycle with coming down with cancer to get an idea of how dread permeates the perception of risk.

- **Against Paternalism:** Consider the possibility that predictability is one component of rationality. Then test this hypothesis in the cases presented at the beginning of this module. Can the risks posed by each project be examined in terms of voluntariness, susceptibility to control, expected benefits, unknown factors, and dread factors? If so, then the public perception of this risk is rational because it can be predicted and understood. Thus, even though members of the public might find other risks of the same—or even greater—magnitude more acceptable, these perceptual factors would render the public’s judgment intelligible and predictable. If all of this is so (and you will be testing this hypothesis in the exercises below) then paternalism on the part of the expert would not be justified. Furthermore, these insights into how risk is perceived by the public should provide you with valuable insight into how to communicate risk to the public.

### Responsible Risk Communication

- **Telling the Truth:** Certainly, responsible risk communication should start with the commitment to tell the truth. But the virtue of truthfulness is more complicated than it might seem at a first glance. For example, were an expert to tell nonexperts the whole truth this might confuse them, especially if the account is loaded with complex technical explanations and jargon. Truthfulness might require some simplification (holding some things back or putting them in different terms), **judicious** comparisons, and the use of concrete images. Thus, the virtue of truthfulness requires (a) understanding the audience and (b) outlining their perceptions, concerns, feelings, and needs. With this in mind, here are some factors that are useful in communicating risk responsibly and truthfully.
- **Know the audience:** What is their level of understanding, their needs, and their perceptions. For example, do they perceive the risk as voluntary, under control, accompanied with substantial benefits, accompanied by effects that are well known, and of a low dread factor? The risk perception framework described above will help you to communicate risk in a helpful and responsible manner.
- **Take measures to avoid deceiving the audience:** The gap between the expert (those in the know) and the public is sometimes quite large. This creates the temptation to fill that gap with less than truthful content. Avoiding deception requires more than just refraining from telling outright lies. It also requires taking measures to avoid subtle manipulation and unintentional deception.
- **Guard against unintentional deception:** (a) Be careful when using rhetorical devices. (b) Use risk comparisons and analogies to provide the public with benchmarks, not to persuade them that because they accept risk X they should accept risk Y. (c) Be sure to point out the limits of comparisons and analogies. (Driving to the public hearing is a risk of a greater magnitude than living next to a nuclear plant but this does not include key factors such as voluntariness, control, and expected benefits. (d) Avoid conflicts of interest. In exercise one below, you will be looking at an example of risk communication taken from the movie **Silkwood**. Think about whether this communication is responsible and honest. Do the interests of the risk communicators coincide with those of the audience? Do the interests of the communicators bias the content of the communication in any way? (For example, does the upcoming vote to keep the union play a role in this risk communication act?)

### 2.3.3 What you will do ...

In this section, you will practice managing and communicating risk information. In managing risk information, you will practice how to empower, inform, and involve the risk-bearing public. In communicating risk, you will practice different ways of helping the public to deliberate on the acceptability of certain risks.

#### Exercise One

- Listen to the doctors communicating the risks associated to exposure to plutonium while working in the Kerr-McGee plant in the movie, *Silkwood*. How effective is this communicative act? (Explain your assertion.) How truthful is this communicative act? (Is truth about risk value-free scientific information or do values play a crucial role in our deliberations on risk? What kind of values are at stake here?)

- Listen to Charlie Bloom's presentation to the Milagro citizens' meeting on the economic and social risks associated with the Devine Recreational Center. Describe in detail the audience's reaction. Analyze both the content and style of Bloom's short speech. Does he facilitate or impede the process and substance of deliberation over risk? Rewrite Bloom's speech and deliver it before the class as if they were citizens of Milagro.
- Paul Slovic pictures a part of the risk perception process in terms of unknown and dread factors. In general, the higher the dread and unknown factors, the less acceptable the risk. Other factors that enter into the public perception of risk are voluntariness, control, expected benefits, and the fairness of the distribution of risks and benefits. Given this depicting of the public's perception of risk, how do you expect the Kerr McGee employees to react to the risk information being presented by the doctors? How will the citizens of Milagro react to the risk information they are receiving on the ethical, social, and economic impacts of the Devine Recreational Project?.

### Exercise Two: Risk Perception

- Choose one of the cases presented above in the Introduction to this module.
- Describe those who fall into the public stakeholder group in this case. (See the above definition of "public")
- Identify the key risks posed in your case..
- Describe how the public is likely to perceive this risk in terms of the following: voluntariness, perceived benefits, control, unknown factors and dread factors.
- Given this perception of the risk, is the public likely to find it acceptable?

### Exercise Three: Risk Communication

- You are a representative from one of the private business involved in the above case
- Your job is to communicate to the public (whose risk perception you studied in exercise two) the risk assessment data you have collected on the project in question
- Develop a strategy of communication that is based on (a) legitimate risk comparisons and analogies, (b) that is non-paternalistic, (c) that responds to the manner in which the public is likely to perceive the risk(s) in question, and (d) is open to compromise based on legitimate public interests and concerns.

### Exercise Four (optional)

- Carry out exercises two and three using either the **Milagro Beanfield War** town meeting or the union meeting from **Silkwood**.
- Pretend you are Charlie Bloom and are charged with outlining the various risks that accompany the Devine Recreational Facility. The rest of the class, your audience, will play the role of the different stakeholders. These could include the (1) townspeople (owners of local businesses such as Ruby Archuleta's car body shop and the general store owner, Nick Real), (2) farmers (such as Joe Mondragon), (3) local and state law enforcement officers (such as Bernabe Montoya and Kyril Montona), (4) Ladd Devine Recreation Center employees (such as Horsethief Shorty who leads the construction crew), (5) local government officials (such as mayor Sammy Cantu) and state government officials (including the governor), and Ladd Devine himself.
- Give a short presentation. Then respond to questions and commentaries from your classmates who are working with the different roles outlined above.
- Take a vote on whether to go ahead with the Ladd Devine project.

## 2.3.4 What did you learn?

### Business and Risk

You are a Corporate Ethics Compliance Officer developing an ethics program for your organization. How should your program respond to the ethics of risk issues discussed in this module? How should your corporation go about identifying and communicating risk factors to employees? How should your corporation go

about identifying and communicating risk factors to other stakeholders such as customers, local community, and government agencies?

### 2.3.5 Appendix

#### Bibliography

1. Covello, V.T., Sandman, P.M. and Slovic, P. (1991) "Guidelines for Communicating Information About Chemical Risks Effectively and Responsibly," in **Acceptable Evidence**: 66-92.
2. Cranor, C.F. (1993) **Regulating Toxic Substances: A Philosophy of Science and the Law**. Oxford University Press: London.
3. Fingarette, H. (1971) **Criminal Insanity**. University of California Press, Berkeley, CA: 171.
4. Mayo, D.G., Hollander, R.D., Editors. (1991) **Acceptable Evidence: Science and Values in Risk Management**. Oxford University Press: London.
5. Mayo, D.G. (1991) "Sociological Versus Metascientific Views of Risk Assessment," in **Acceptable Evidence**. Oxford University Press: London: 249-280.
6. Slovic, P. (1991) "Beyond Numbers: A Broader Perspective on Risk Perception and Risk Communication," in **Acceptable Evidence**: 48-65.
7. Perrow, C. (1984) **Normal Accidents: Living with high-risk technologies**. Basic Books, NY,NY.
8. Reason, J. (1990/1999) **Human Error** Cambridge University Press: London.
9. Sagoff, M. (1985) **Risk-Benefit Analysis in Decisions Concerning Public Safety and Health**. Kendall/Hunt: Dubuque, Iowa.
10. Sagoff, M. **The Economy of the Earth: Philosophy, Law, and the Environment**. Cambridge University Press: London.
11. Sandel, M.J. (1982/1998) **Liberalism and the Limits of Justice, 2nd Ed**. Cambridge University Press, London.
12. Shrader-Frechette. (1991) "Reductionist Approaches to Risk," in **Acceptable Risk**. 218-248.
13. Thompson, P.B., (1999) "The Ethics of Truth-Telling and the Problem of Risk." **Science and Engineering Ethics** 5(4): 489-510.
14. "Glossary" Online Ethics Center for Engineering 1/31/2006 6:57:46 PM National Academy of Engineering Accessed: Saturday, December 27, 2008 [www.onlineethics.org/CMS/glossary.aspx](http://www.onlineethics.org/CMS/glossary.aspx)

This optional section contains additional or supplementary information related to this module. It could include: assessment, background such as supporting ethical theories and frameworks, technical information, discipline specific information, and references or links.

### 2.3.6 EAC ToolKit Project

**2.3.6.1 This module is a WORK-IN-PROGRESS; the author(s) may update the content as needed. Others are welcome to use this module or create a new derived module. You can COLLABORATE to improve this module by providing suggestions and/or feedback on your experiences with this module.**

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**2.3.6.2 Funded by the National Science Foundation: "Collaborative Development of Ethics Across the Curriculum Resources and Sharing of Best Practices," NSF-SES-0551779**



# Chapter 3

## Project Humans Resource Management

### 3.1 How to Detect Cultural Differences<sup>1</sup>

**Contents:** Reading • Assignments • Student Engineers' Commentaries

NOTE: This version of the module has no attached video clips. Later versions will have video attached.

NOTE: This module was prepared by Dr. Ute Cezeaux of Intercultural Training Associates. Mr. Dan Erchick has contributed additions valuable for medical volunteers. Several students also contributed to the readings in the module. The preparation of this module and others in the "Preparing for Engineering Communication in Developing Countries" course was supported by a generous grant from the Engineering Information Foundation. We are grateful for their belief that today's engineering students need information that will prepare them to deal with international collaborations.

#### 3.1.1 MODULE READING

##### 3.1.1.1 Preliminary Matters

Engineering students working on field projects in other countries face several communication challenges. Typically they come from a US college environment and are accustomed to live and learn among peers and professors in an English-speaking environment where codes of conduct are generally understood by all without paying too much specific attention to them.

When these students arrive in the developing country at their rural non-English speaking project site, things change on many levels. In addition to obvious language difficulties, basic assumptions about how to get things done and even whether things should be done will be challenged, sometimes openly, more often in many subtle ways.

Additionally, students working on outreach engineering projects all over the world face specific challenges not encountered by casual visitors or long time workers, such as Peace Corps volunteers or missionaries who are committed to several years in the foreign location. Student engineering groups are generally on location for 7 to 10 days during spring break or in the summer, and even though there may be repeated visits to the same village, the individual members of the group may change. These conditions create challenges that are specific to engineering communication in traditional societies.

This web site is designed to share with you some of the cultural challenges students have experienced in Engineers without Borders projects, help you identify common areas of difficulties, and suggest strategies to prepare to cope with them. The stories of these students' varied projects, experiences, approaches, strategies,

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<sup>1</sup>This content is available online at <<http://cnx.org/content/m14686/1.4/>>.

surprises, successes and failures were collected and discussed in a cross-cultural training course for engineering students at Rice University in Houston, Texas, USA in the spring semester 2007 under a grant from the Engineering Information Foundation. We hope that their accounts will help you anticipate the exciting and complex challenges of communication abroad.

**NOTE: For students without experience in US culture.** The students who tested the modules for this project in class were United States engineering students of various cultural family backgrounds. Almost all of them had worked on engineering projects in El Salvador, Nicaragua or Mexico. One student had a special interest in and some experience in Mongolia and China. Examples and exercises in these modules assume familiarity with United States American culture, sometimes specifically in the United States college setting. If you use these materials and you are not familiar with the US American background, you would have to rethink the issues raised and substitute exercises and comparisons that would clarify the issues for you or your students.

### 3.1.1.1.1 Prior Readings

Before you begin using this module and others in the course, you may wish to read portions of Iris Varner and Linda Beamer's **Intercultural Communication in the Global Workplace** (2005), which focuses on the professional context of intercultural communication. Chapters 3 and 4 especially lay out the concepts of underlying values that affect behavior in different cultures. The context of traditionally structured societies, which the modules in this Connexions series address, differs from the professional context Varner and Beamer describe in the level of technical training that local partners for outreach projects have. Two excellent publications produced for the United States Peace Corps are also useful:

- **Learning Local Environmental Knowledge: A Volunteer's Guide to Community Entry** (Information Collection and Exchange Publication No. M0071, Peace Corps 2002) and
- **Culture Matters: The Peace Corps Cross-Cultural Workbook** by Craig Storti, which is also available in English or in Spanish as *La Cultura Sí Importa: Manual Transcultural Del Cuerpo de Paz* as a free .pdf download at Peace Corps Web Site<sup>2</sup>

### 3.1.1.2 Detecting Cultural Differences

When you want to work successfully in another culture, it becomes very important to understand the 'language you yourself speak', not just the words and the grammar of your own language, but the underlying, often subconscious, assumptions you make and the underlying values that you rely on. When you understand the implications of your own language, then it becomes easier to deal with the reality that the "language local people speak" is not just a literal translation of yours, but is embedded in their underlying cultural values and assumptions. Communication across cultures is not easy. As we all know, the possibility of misunderstanding is always present, even among members of the same culture who are communicating in the same language. The possibility of misunderstanding, even if everybody is of good will, is exponentially increased when you cross cultures.

#### EXERCISE

##### Exercise 3.1.1

(Solution on p. 190.)

- Ask each person in your group to take a standard sheet of 8 1/2" x 11" paper. Ask one person to read the following directions to the group. Without demonstrating or telling anyone how to hold or fold the paper, read the following words exactly, read slowly, and only read once. Or, if you are working independently, skip to 1.3, Comparing Cultures.
- Ready to start? Stand up. Close your eyes and keep them closed throughout the exercise. Do not ask any questions.

<sup>2</sup><http://www.peacecorps.gov/wws/publications/culture/index.cfm>



- Fold your piece of paper in half and tear off the bottom right corner.
- Now, fold it in half again and tear off the upper right corner.
- Now, fold it in half again and tear off the lower left corner.
- Fold your piece of paper in half and tear off the bottom right corner.
- Now, unfold the whole page. Compare your page with the other people's. What do you notice?"
- 
- (Developed by Russel Dore, Fruehauf Corporation, Detroit, Michigan)

### 3.1.1.3 Comparing Cultures

When you want to compare cultures and eventually identify specific differences that require special attention, cross-cultural trainers often use the picture of the iceberg. Only a small part, the tip of the iceberg, is visible, the major portion of the iceberg is submerged and can become dangerous to a ship. Everybody wants to avoid the calamity that befell the Titanic, the famous passenger ship that ran into an iceberg on her first voyage and sank, taking hundreds of passengers with her.

Applying this image, the tip of the iceberg shows the visible part of the culture or, more specifically, the part of the culture that can be perceived through all the senses, the things you can see, hear, feel, taste and smell: the architecture, the food, the music, the literature, the art and much more. This is the part of culture that the tourist is interested in and that the short-term visitor perceives as different, interesting and sometimes exotic.

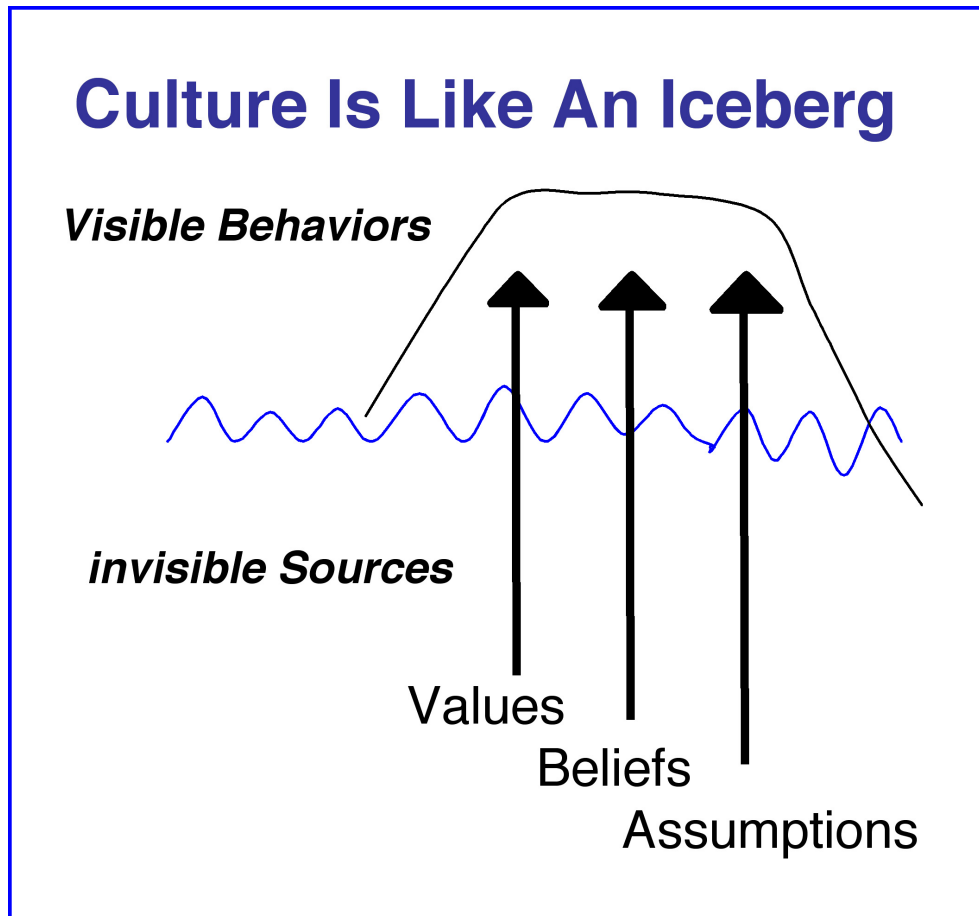


Figure 3.1

Below the surface is the invisible part of culture, the differences that are perceived by long-term visitors, the people who try to live in the culture for an extended period of time. These people realize—often slowly—how essential the under-the-surface components of the culture are and how deeply they affect everyday life. Here we look at questions like: How do people identify themselves, as individuals or as members of the group? How is time perceived: is it controlled by the person or not? How are children raised—what are the most important things they have to learn? Are old people respected for their wisdom? What is important when people talk to each other—do they say things straight out, or do they assume that you know how to read between the lines? How is power distributed in the community? Who has it, and how much? In the submerged part of the iceberg of culture we find the values, the beliefs and the often subconscious assumptions that most members of the culture share.

**In summary:** Here is the important insight, especially for groups like engineering students, who want to work successfully with rural villagers on very short-term projects: the underlying values, beliefs and assumptions of a culture affect what you see on the surface in the behavior of the members of that culture. In other words, if you know something about the values, beliefs and assumptions of your own culture and the culture you are going to work with, if you understand the major differences, then it will become easier to deal with the behavior patterns of everyday interactions and you can become more creative and hopefully

more successful in solving the big and little problems of getting your project completed.

### 3.1.1.3.1 Norms and Variations

When we talk about the US Americans we have to define on what we mean. Whenever you ask a culturally based question such as “How do you show friendliness and respect when you greet somebody?” to a large group of Americans in different parts of the country, in different population groups and at different age levels, you will get a wide variety of answers. Not all Americans act or think alike in the same situation. The many answers could be sorted statistically and the result would probably show a bell curve, a line through the apex would then show how most Americans would deal with the particular question. The same would hold for the foreign culture. The two bell curves might overlap indicating that some people in both cultures would deal with that question in the same way and would have fewer misunderstandings in dealing with each other. This example shows that all cultures have many variations. In general, these variations are more noticeable when you are in the country. When you look at a culture from the outside, the common elements tend to stand out.

#### US American Values and Beliefs

In your cross-cultural class you can brainstorm the most important US American values, beliefs and assumptions. You might come up with concepts like: individualism, self-reliance, competition, equality, can-do-spirit, hard work, informality, and a direct communication style.

There are many ways to study the main values of your own culture:

One way is to look at how children are raised in your culture. Parents all over the world want to teach their children what will make them successful in their culture. US American children are taught independence and self-reliance at an early age. “You can do that yourself,” “Figure it out,” “What do you think?” and “Ask your teacher, brother, grandpa” are phrases heard from parents and teachers.

Another way to study main values is to listen to comments of foreign visitors. Here are some quotes from foreigners who have worked or studied for a while in the US: The examples below were taken from L. Robert Kohls and John M. Knight’s **Developing Intercultural Awareness: A Cross-cultural Training Handbook** 1994:

- “Americans seem to be in a perpetual hurry. Just watch the way they walk down the street. They never allow themselves the leisure to enjoy life; there are too many things to do.” (Visitor from India)
- “In the US everything has to be talked about and analyzed. Even the littlest thing has to be “why? why? why?” I get a headache from such persistent questions. I still can’t stand a hard hitting argument.” (Visitor from Indonesia)
- “The American seems very explicit, he wants a ‘Yes’ or ‘No’ – if someone tries to speak figuratively, the American is confused.” (Visitor from Ethiopia)
- “I was surprised, in the United States, to find so many young people who were not living with their parents, although they were not yet married. Also, I was surprised to see so many single people of all ages living alone, eating alone, and walking the streets alone. The United States must be the loneliest country in the world.” (Visitor from Colombia)
- “Imagine my astonishment when I went to the supermarket and looked at eggs. You know, there are no small eggs in America, they just don’t exist. They tend to be jumbo, extra large, large and medium. It does not matter that the medium are little. Small eggs don’t exist because, I guess, they think that might be bad or denigrating.” (Visitor from The Netherlands)

“What Bothers Nationals about Working with US Americans in Their Community” Adapted from: L. Robert Kohls, *Survival Kit for Overseas Living* 1984

We carry with us our own cultural baggage. When we work in a foreign environment, our way of doing things contrasts with the local way, and our attitudes and behaviors—which look positive to us—may appear differently in the foreign environment. Here are some characteristics of US American workers that have stood out in a foreign culture

- They expect to accomplish more in the local environment than is reasonable.

- They are insensitive to local customs and norms.
- They resist working through normal administrative channels.
- They often take credit for joint efforts.
- They think they have all the right answers.
- They are abrupt and task oriented, insensitive to the feelings of others.

### 3.1.1.3.2 Continuums of Values

When you think about underlying values, beliefs and assumptions in different cultures, you can think in terms of continuums, with extremes on either end. Research has located cultures at various point on a value continuum. Some cultures can be found close to one end; other cultures may be found closer to the opposite end. For example, members of some cultures think about themselves as independently acting individuals; members of other cultures think primarily of themselves as integral members of a group, with primary responsibilities toward that group.

Other cultures could be located on these continuum lines and similar lines could be drawn for other values, beliefs and assumptions. The locations are not engraved in stone but are simply guidelines to stimulate observation, questions and discussion in preparing to work in another culture.

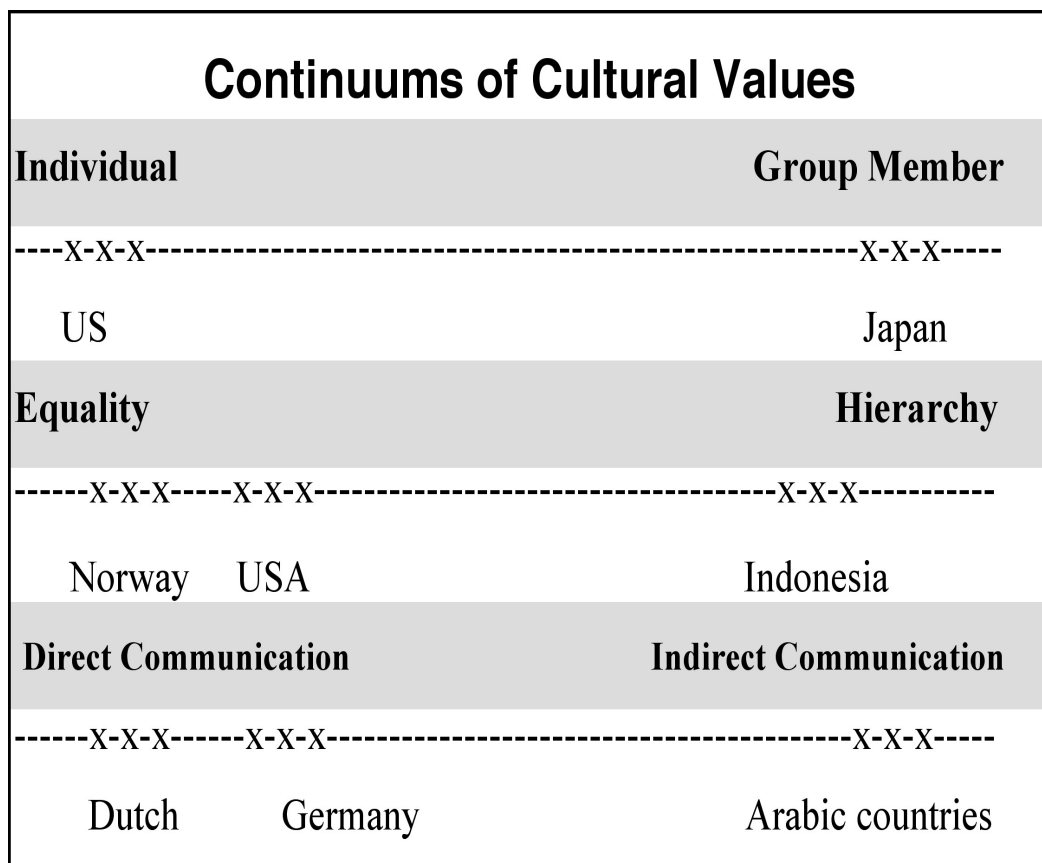


Figure 3.2

### 3.1.1.4 Communication Styles

People have different styles of communication. Some people are direct: they rely on words and data. Other people are indirect: they suggest, they hint at what they really mean, they don't just use a precise word, they may use a descriptive phrase or a picture, or tell a story and expect the listener to infer the meaning. In the same way, languages and the cultures they express can be either more direct or more indirect, more precise or more vague. The Dutch speaker will know that the Dutch listener will expect directness, even bluntness, and will not be offended. The Japanese speaker, on the other side, will know that he does not have to be precise; the listener will take into consideration the surroundings, the subtle non-verbal message, and will understand; and by avoiding directness, face will be saved for both sides.



Figure 3.3

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To illustrate the possible frustration and resulting non-communication, let me tell you about one of my experiences. I remember that in China I once listened with a group of other US Americans to a lecture by a Chinese professor on Chinese watercolor painting. The professor spoke excellent grammatically correct English, but the Chinese indirect communication style came through so strongly that most Americans could not follow the circles and spirals of the thought patterns and simply grew too tired to listen. They were accustomed to a much more direct style that quickly got to the point and stated each point clearly and as a result, they missed learning more about a very special form of art.

## 3.1.2 ASSIGNMENTS

### 3.1.2.1 Assignment: Analyze a Dialog

To practice paying attention to the differing mindset of speakers from different cultures and detecting differences in underlying cultural values and communication styles, we look at a conversation taking place in a work situation between a US American CARL and a Hispanic JUAN who may be from a South American country. The dialog and the comments are from Craig Storti's **Cross-Cultural Dialogues** (1993).

### 3.1.2.2 Dialog: A Helping Hand

- CARL: Hey, Juan, Is everything OK?
- JUAN: Yes, sir. I was just explaining to Raul here about the new drill press. Some of the men aren't sure about it yet.
- CARL: I know. Actually, I overheard you; what you were telling Raul isn't exactly right.
- JUAN: No?
- CARL: No. You have to turn on the fan before you switch on the water jet, not after. Now try it, Raul. (Pause) Yes, That's it. Any more problems with this, Juan, Just come and ask me. That's what I am here for.
- JUAN: Thank you, sir.

In their discussion of this short dialog the students identified behavior that could be traced back to values of hierarchy, task or relationship orientation, saving face, direct and indirect communication styles and made suggestions to improve the interaction.

Now take a look at Storti's critique of this transaction:

**Example: A Helping Hand (comments by Craig Storti p.70)**

- Juan is not pleased. To be corrected in public is bad enough, but to be corrected in front of a subordinate – someone he supervises and would be expected to know more than – is especially humiliating. What Carl should have done, of course, is to have taken Juan aside later and, without even mentioning the “mistake,” reminded him again how the new drill press worked. (Juan would then realize, without anything being said, that he had given Raul incorrect instructions).
- Carl has been boorish even by American standards, but it is typical of him to have zeroed in on the task. His first thought – his instinct - is to correct the error Juan has made so that the work will proceed smoothly and production won't be disrupted. What really matters, in other words, is efficiency and not whether someone's feelings get hurt.
- But is this altogether fair to Carl (and his compatriots)? Granted, he may be just another cold unfeeling American manager possessed of a characteristically single-minded obsession with production (and the worker be damned). But as we have noted before, Americans tend to identify very closely with their work; if our work is good then we are good.
- In this context, Carl's impulse to correct Juan might very well be an expression of his instinctive concern for Juan's feelings. After all, Juan would be embarrassed if the men under him kept making mistakes and production in his division plummeted. In short, the typical American manager's obsession with output and production doesn't necessarily mean a lack of caring for the worker. If workers identify with their work, then worrying about output is synonymous with caring for the worker.

### 3.1.2.3 Summary and General Advice

When you are working as a student engineer on a project in a rural community some general points are important to remember.

- Do not automatically assume that you understand
- Assume that you do not understand
- Do not react automatically
- Observe attentively
- Listen carefully
- Do not judge quickly; instead, wait
- Ask questions gently

In summary: stop, look, listen, learn before you respond and act

### 3.1.2.4 Assignment Two: Narrating Cultural Awareness

#### 3.1.2.4.1 Including Unexpected Cues

Note: This assignment draws on readings from **Culture Matters** and on the reading by Dr. Cezeaux, above. The reading featured the “iceberg,” with visible cultural differences floating above the water and deep values concealed below the surface. The reading brought out observations about differences in views of time, gender roles, and the amount of reliance on what people already know when choosing what to include in a communication (the US tells all; other cultures expect listeners to have a high degree of shared knowledge). The readings asked you to pay attention to the following questions:

##### 3.1.2.4.1.1 Questions about the self in society

- Is the basic unit of society the individual or the collective?
- Is obligation a burden or a benefit?
- Is age valued or is youth valued?
- Are genders equal or unequal?
- Are gendered activities negotiable or restricted?

##### 3.1.2.4.1.2 Social organization questions

- Is group membership temporary or permanent?
- Is form important or distrusted?
- Are personal activities private or public?
- Is social organization horizontal or hierarchical?
- Is approach to authority direct or mediated?

This assignment has only one part. We imagine this assignment will be about two pages long, double-spaced, or longer, as you see fit. In it, you will demonstrate your ability to reinterpret and teach others from your past experiences and by your increasing cultural competence by writing a narrative. We imagine that stories like this will be the heart of your instruction for future engineering outreach groups. This exercise will also give you a chance to practice preparing other engineers for assignments abroad.

This narrative should describe

- A problematic or unexpected situation
- How you originally defined it
- How you “solved,” “responded,” or “flubbed” it
- How you now see it

As you set the scene, you should think about the “iceberg diagram.” Include cultural cues (both “surface” differences and some indication of deeper differences in values) you did not originally expect (and that other engineering students may not expect), in your narrative.

Include some communicative actions that were involved: Don’t just say, “The pump didn’t work properly; replacing a valve with one scavenged from a damaged one at the church fixed it.” That account masks a whole lot of interaction and thinking. Tell us how you thought of the problem; how your local collaborators thought of it; how you found out another defective pump was stored in the church, whether you asked for help; how you approached a person according to his or her status in the village (or failed to), whether you were expected to pay; etc., etc.” You might also include differences in vocabulary or different meanings associated with a term. For example, if a Mexican government official asked whether you had taken your proposal or agreement to a notary public, you might not have realized that this common phrase in English, “notary public” has a totally different meaning in Spanish-speaking countries, where a “notary public” is certifying the legality of an agreement, and his or her services cost a great deal.

**The Afterword.** End your narrative with an “afterword” (literally, the opposite of a foreword; the words written in reflection or as a comment on the text)—a section that others could read after they have read and discussed your story. Add your “lessons learned” or take-away notions there. **You may want to read some of the student engineers’ commentaries (below) to stimulate your memory.**

### 3.1.3 STUDENT ENGINEERS’ COMMENTARIES

#### 3.1.3.1 Alec Walker: Rethinking my next projects in the Peoples Republic of China

The time I spent in class inspired me to be proactive in developing guidelines for the attitude that I will adopt while working to accomplish a specific goal in a foreign community with a different culture. I had conceptualized cultural differences as obstacles with which to slowly familiarize myself on an intuitive, experience-based level. One of the first major points that was covered in class was that culture is a category under which to file one’s architecture of thought. Cultures can be appreciated by a temporary visitor, but they cannot be learned in the same way that a native of the particular community has learned. This does not mean, however, that an attempt made by a visitor to study a host culture with the objective of working through it is futile. In addition, preparations can be made by the visitor before arrival to facilitate this process.

The two potential future trips that I foresee for myself in the coming years are 1) to Chengdu in Sichuan province, China to teach English, and 2) to Bayaan Ulgii in Mongolia to provide Engineering service work in water treatment or energy distribution. I will consider the specific concepts, techniques, and processes discussed in the class as they will apply to each of the three potential future trips, and the differences in projected successes of each method will be compared.

Each of the trips shares certain commonalities: I will be a foreigner working within a subgroup of a larger community with a different culture, I will be working to accomplish a specific goal that is independent of the culture in which I will be immersed, and I will only be there for a definite amount of time (less than 3 months). The techniques to consider are:

A) encouraging needed communication through an alternative or indirect route, B) categorizing the culture in general qualitative spectra, and C) gauging the optimal adjustment of my goal in response to cultural hurdles.

The following is a brief expansion of the general methods I have applied below.

A) includes requesting an audience with specific members of the community in private, requesting that members of a community arrange a play about the desired topic, or asking for anonymous reviews, written or oral. This method is to be employed in situations wherein cultural boundaries prevent communication necessary for the completion of the goal. The spectra B) in which to classify the host culture include collectivism versus individuality, egalitarian versus hierarchical, direct communication versus indirect communication, task oriented versus relationship oriented, and linear time versus cyclical time. This method is employed to develop and retain a broad sense of the guidelines and expectations of the community. C) includes revision of a goal in a vacuum (out of cultural context) followed by revision with respect to results obtained from A) and B). The two revisions are compared, and a hybrid is developed until the time for the next revision.



### 3.1.3.1.1 Examining trip 1 to Chengdu in Sichuan province

A) The English language students will be girls and boys at the high school level, and they will be used to a strict and quantitative approach to learning. They will know off-hand how many English words they can write and what their test-score history is. They will be used to learning under a lecture style of teaching and adhering to military-like disciplinary standards. Most high school teachers in Chinese cities are under administrative pressure to train students to produce certain test scores on certain exams. These initial assumptions may be invalid and will change. My goal is to teach them English, and I must make them aware of how this differs from boosting their exam scores. The majority of the class will be interactive and questions will be encouraged.

Depending on the number of students, I will either hold meetings with individual students requesting feedback on teaching style, or I will ask for a certain number volunteers with strong opinions. I will also have a slit-topped shoebox wherein students can submit comments or critiques in English or Chinese. I will hold meetings with parents to discuss my methods and keep all members of the community up to date on my dealings. I will encourage students to put on performances, in English about topics they choose and in Chinese about how they think the class is going.

B) I rate Chinese culture as a collectivist, hierarchical, relationship oriented culture with a linear time sense and tendency towards indirect communication. I will scale these generalizations from one to ten periodically.

C) Perhaps my goal will change, and I will tend towards a teaching style geared towards boosting the students' statistical academic standings and developing their traditional showing of respect after analyzing the feedback I get from the community.

### 3.1.3.1.2 Examining trip 2 to Bayaan Ulgii in Mongolia

A) The staff in the Engineering company where I will work will have limited technical background, as Mongolian schools lack resources and qualified technical professors. The employees will be diligent workers with pride in their position, and they will likely follow instructions and wait for approval before making decisions. These assumptions may be invalid and will change. My goal is to provide a technical perspective with an emphasis on sustainability and safety. I will establish what is desired, offer encouragement towards long-term company-health thinking, and emphasize the associated health risks and injury prevention techniques.

B) I will invite my colleagues to go on walks or horseback rides with me, spending the day talking and exchanging stories. In my experience to date, time and space coverage greatly facilitate Mongolian inner and inter company business. I will hold sustainability, and environmental and personal health meetings for colleagues. I will inform them of what I have been informed, maintaining humility. I will compete with colleagues in numerous games. I rate Mongolian culture as individuality based, egalitarian, directly communicative (slow and repetitive), task oriented, and cyclical time oriented.

C) The results from A) and B) may change my goal. I may slacken my safety regulations and sustainability expectations, adopting instead a more short-term outlook on accomplishing specific engineering goals.

### 3.1.3.2 Sean McCudden: Rethinking Unexpected Developments in Mexico

When my team travels to Mexico, we bring local food to a woman in the village (let's call her "Sara") who cooks for us. In addition to providing all ingredients, we pay Sara \$15US per day. The Mexico team first visited the village the year before I arrived at the university and became involved with engineering projects. I have learned that the team was referred to Sara by a missionary in a nearby village and with only that recommendation to go on, it contacted Sara about cooking.

In my experience, Sara has performed her cooking duties well and she converses amiably with us, but conflicts have arisen. She and her husband (call him "Juan") appear to try to take advantage of her role as "feeder of the Americans" and seem to be a source of strain in the community. In addition, Juan is on the Water Board, which oversees the pipe distribution system from the well and our recently implemented biosand filter construction. It is difficult for me to get a full sense of how extensive the conflicts are through

translations, but our translators report subtle elements in the language that suggest they could be splitting the village.

Some concrete examples are Sara's asking us to lay pipe from the pump directly to her house (which other residents don't have and while we have made clear that our role is not to decide placement of the distribution system). On our team's most recent trip during Spring Break, we constructed biosand filters to purify their water. We announced to the community that we would not decide the distribution of the filters we built; the Water Board would. We left sufficient construction materials in the village for the residents to build their own household filters. Yet, Sara asked if one that we built could be hers. Juan is very capable to construct their own, but he did not even assist us (as we had asked the entire community to do so that they could get hands-on experience), despite being on the Water Board.

In addition, our team's translators have said that they sense tension between Sara/Juan and the rest of the village, including Juan's position on the Water Board and his use of it for personal gain. The translators say it is subtle phrases that suggest these conflicts, but they are consistent.

Moreover, my team leaders say that the worst part of any Mexico trip is negotiating Sara's payment at the end, as she asks for advances or denies that we paid her previous advances. Added to this are constant requests for goods like propane gas and diapers which are reasonable in themselves, if we need to stop by the store anyway, but she does not readily reimburse us. We are also fairly certain that she asks us to buy more food than we eat and that she saves the leftovers for her family.

All the above has created a difficult situation for our team. We originally contacted Sara because we had no other information and she has not done anything to overtly lose her cooking job. However, I am concerned that we are creating conflict in the village by giving her a perceived power that she and her husband use for personal gain. This would not be very disconcerting if it only involved us, but it seems to extend to the Water Board and its relationship with the community. Our team could easily ask another family to cook for us, but that may damage more relationships than it helps. We have delicately tried to investigate the issue. For example, on the Spring Break trip we asked a community youth who befriended us whether our \$15US per day was fair payment. He agreed that it was, so I do not trust that Sara is just trying to compensate for being cheated.

**Afterword.** Since we are closing in on the completion of our project, I do not believe we should do anything to drastically change our relationship with the village. I do believe that we need to clearly emphasize our role in the community whenever we have the chance. Especially important is defining the Water Board as in charge of the water projects and as democratic and following the will of the village. We should also demonstrate our desire that Sara and Juan take a prominent role in assisting our projects.

Our team clearly has influence in the community and they appear to try to use their position to wield some of their own. We have denied their excessive requests, but we have not raised the issue of our buying extra food. Since we can only surmise that they keep leftovers from our own estimates of what we eat, anything we say will only reveal our suspicion, which could make our relationship worse. We should only bring it up (gently) if Sara asks for even more food or money. When we contact a new community to begin another project, it will be important that we establish a personal relationship with the residents, so we should find a food and sleep host as quickly as possible, but we need to take care on our choices in light of our experience.

### 3.1.3.2.1 Ketan Shah: Taking Cultural Practices into Designs for a Community

In January 2005, our team traveled to a small community in El Salvador to install a 40,000 L water storage tank for community use in order to increase access to water and decrease the time people had to wait to get water. We had been on a survey trip a few months earlier, and during our time at school, we designed the water tank and adjacent washing stations for the community. Although we had already sent the designs down to the community before we arrived and thought they approved, we did not realize that some of the system components were not compatible with their ways of doing things.

When we built the tank, we also built washing stations and showers next to the tank. Washing stations, or *pilas*, are the method of washing clothes people in Latin America use – a *pila* consists of a large basin that is filled with water and two elevated surfaces around the basin on which to scrub the clothes. When in use, the drains on the *pilas* should be stoppered so the water can fill up. With this in mind, we installed removable drain clogs to each of the *pilas* so that they could be filled up and drained as needed. This did not seem to be a problem when we were constructing them, but after we returned from our trip, we heard from the community that the stoppers that little children had been stealing the stoppers and that it was too expensive to continue to replace them.

This problem was due to a difference in cultural interpretation and assumptions on both parts of the project. Our team assumed that the community would want removable stoppers in their *pilas* because they are so common in the United States. On the other hand, the community members did not even realize that we had included the stoppers in the design, so they could not address their concerns about the stoppers. Because neither side realized that the stoppers were an issue in the design, the potential problem was never even addressed until we found out about the stolen stoppers. After talking about it with the community, we decided that there was no harm in not having any stoppers at all. Originally, our concern was that if there were no drain in the *pilas*, the standing water would collect mosquito larvae; however, the community assured us that abate, a poison for mosquito larvae, was readily available through the local health clinic. Thus, the solution to the problem was to fill the drains with concrete to allow water to collect and kill the mosquito larvae with abate.

In following out our original design, we also ran into one other implementation problem during our trip. We constructed a shower behind the tank for all community members to use. However, on our next visit to the community, we found out that the community members had ripped down the shower, reconstructed it in another corner, and claimed it as a “men only” shower. Once again, this problem was caused due to differences in deep culture and a lack of communication between the two sides on the project.

Our team assumed that the showers would be for both male and female use because that is how we would address the situation in the United States. However, in both the surface and deep culture in El Salvador, men are considered the dominant sex, so the showers were assumed to be only for the men. We talked to the women of the community and found that they did not agree with the “men only” shower situation and that the changes were made without their approval. Therefore, we did not change our stance on this situation as we did in the previous situation with the drain stoppers.

We held a community meeting and explained what we felt the differences between the two cultures were. We also explained that the purpose of our projects is to benefit everybody in the community, and that if we had realized that this part of the project would benefit only the men and estrange the women, we would not have constructed the showers. After talking to the community, they agreed to make the showers for both males and females, and the problem was resolved.

**Afterword.** This story describes two problems that took place as a result of our original water storage tank design and construction. The first problem occurred due to different cultural assumptions and lack of communication, and the second problem occurred due to different cultural view and lack of communication. These two stories illustrate an important lesson in intercultural communication. It is important to come to agreements based on the interaction of both cultures, not just one of the cultures.

In the first issue, there was no harm in letting the community use the solution they were used to, so it was the better course to follow. However, when the difference in culture clashes with the beliefs upon which the project was created, as in the second problem, it is important to discuss with the community to come to a mutual agreement. **In other words, I believe it is important to recognize the community’s**

**culture while still negotiating to include important aspects of your own.**

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### 3.1.3.3 Reflection or Discussion Opportunity

Select one or more of the students' commentaries and discuss them. What other additional issues from the reading can you apply to the students' situations? Do you agree that the team should have insisted on the community's making the shower stall available to all adults in the community?

### 3.1.3.4 END OF MODULE

END

## 3.2 International business for entrepreneurs: Organizational structure and human resource management<sup>3</sup>

### 3.2.1 Organizational structure and human resources management

One of the fundamental challenges facing companies of all sizes is determining how to organize and staff their operations. This task becomes even more complex when a company decides to do business across national borders.

A small business owner may start out as the only employee in his or her company. In this case organization and staffing simply involves the efficient allocation of the owner's time and attention to the various tasks associated with the business. As the company grows, more employees will probably be hired. When this occurs, it is useful to explicitly look at how tasks can be allocated across employees in a systematic way. As the company grows still larger, it is often useful to begin organizing the company into departments.

In many cases, a company's early moves overseas involve reacting to an apparently random or unexpected overseas business opportunity. At first, such business may be conducted anywhere in the organization on an ad hoc basis. As a company extends its operations overseas, it takes on additional complexity as decisions have to be made which address global and local product design, local responsiveness to individual markets, cross-border financing, etc. As the international side of the business grows, many companies conclude that a reorganization of some type can better handle the current international business demands, and better position the company to take full advantage of international opportunities as they arise. In the following section, several common international organization structures are briefly described.

#### 3.2.1.1 International division

Perhaps the simplest start for many organizations is to adopt what is known as an international division. With the addition of an international division, the domestic organization may remain relatively unchanged while an additional side structure is added. This additional structure (in collaboration with the domestic structure) takes on the responsibility for virtually all international business. This structure assumes that there are skills associated with doing business overseas that will transcend the typical business lines. Market assessments, compliance with export/import regulations, arranging shipping, identification of local representatives, establishment of dedicated sales offices, production facilities, etc. are all examples of tasks often assigned to the international division.

*Advantages:* The international division is effective in consolidating international activity under one area of responsibility. Such a division develops international expertise that can serve all areas of the organization. This eliminates the need for every part of the organization to master the ins and outs of doing business overseas (this can sometimes be quite complex).

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<sup>3</sup>This content is available online at <<http://cnx.org/content/m35610/1.4/>>.

*Disadvantages:* On the other hand, the existence of an international division encourages the organization to approach their business in an artificially dichotomous manner. Part of the business organization focuses primarily on the home country market, while the international division serves “the rest of the world”. In most organizations such a structure lends itself to a continuing preoccupation with the home country market.

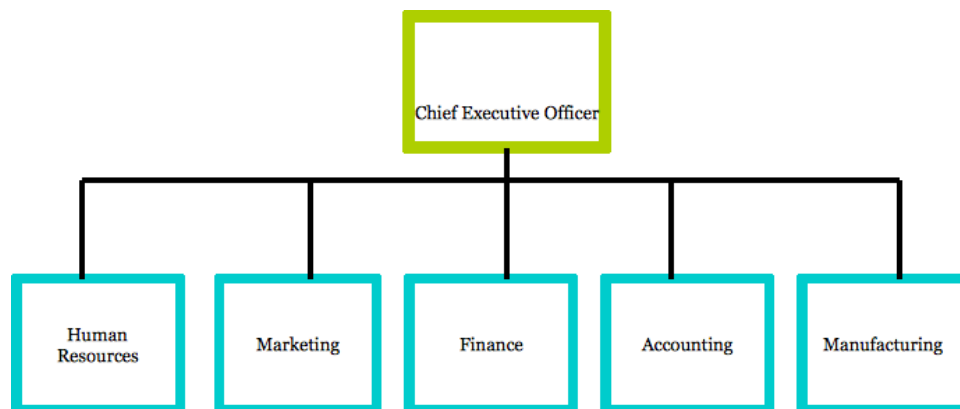
As a company becomes more serious about overseas business, it often finds it useful to adopt a more sophisticated global structure. Four examples of such organizations are included below.

### 3.2.1.2 Global functional structure

A global functional structure is often adopted by companies with a very limited product scope. A CEO will oversee a number of business functions that have been identified as critical to business operations. Because the product mix is singular or limited, the CEO can coordinate the work of the functions and bring the resources of each to bear on the product line. In this case, the CEO serves as the common denominator between the functions.

*Advantages:* In many organizations, the primary sources of expertise are functionally based. Therefore, economies of scale can be achieved by grouping these resources by function. In the case of human resources, for instance, a central human resources function can serve as a consultant to all parts of the organization on issues such as pay and performance evaluation. This eliminates the redundancy occurring when multiple parts of the organization attempt to develop such programs on their own. A functional organization also enables the organization to standardize policies, practices and procedures that can be carried out throughout the organization.

*Disadvantages:* The primary focus on business functional activity, often distracts organizations from specific product requirements, customer needs, and geographic idiosyncrasies. With the top of the organization serving as common denominator and arbiter between the functions, strategies may not reflect realities on the ground as decisions are made without the benefit of close interaction with customers and deep understanding of local circumstances.



**Exhibit 3.4:** A global structure

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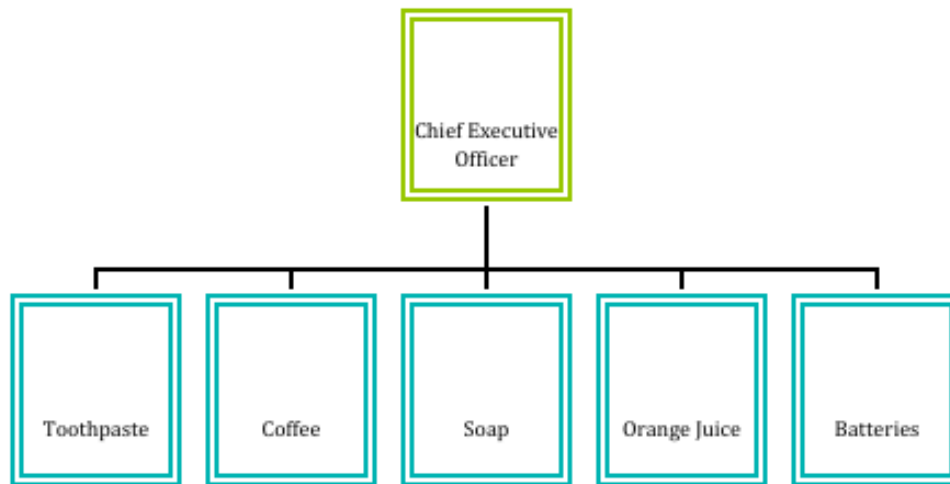
### 3.2.1.3 Product structure

A global product structure is often chosen in companies with an array of diverse product lines. Each product line is assigned to its own organization unit so that decision-making is focused on the product characteristic

and the customers who will be targeted. In many cases, the product unit will have its own functional organization—in essence, operating as a stand alone business in the context of the larger organization. In many cases, a product unit will be managed with full profit and loss responsibility.

*Advantages:* The main advantage of a product structure is that it focuses attention and resources toward a single product and the customers toward which that product is targeted. Decisions are optimized for the success of the product and distractions are minimized.

*Disadvantages:* Redundancies often exist across product organizations as functional responsibilities are duplicated under each product organization. Economies of scale and scope are more difficult to achieve as this organization structure encourages less cooperation and coordination across the product units.



**Exhibit 3.5:** A product structure

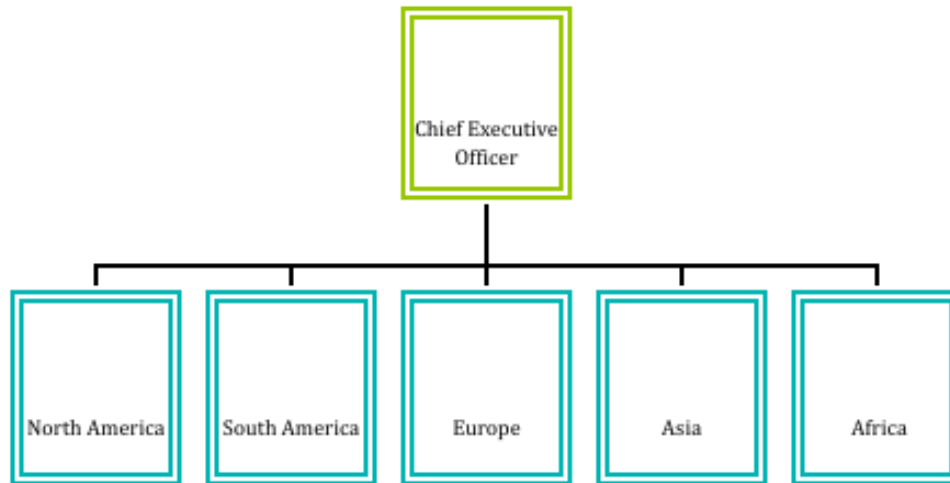
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#### 3.2.1.4 Area/geographic structure:

An area structure is often chosen by companies who want to emphasize geographically specific strategies and focus decision-making on local needs. Organizations may be divided up into regional and country structures where country managers operate rather autonomous businesses supported by an array of local functions. In this case, the country organization often operates as a fairly self-contained business with substantial local authority as well as profit and loss responsibility.

*Advantages:* The country organization is capable of sensing and understanding local conditions and is able to formulate strategies which effectively meet the needs of local stakeholders. Policies in areas such as human resource management can be tailored to meet the needs and expectations of local employees, product mix and design can be optimized for local conditions, and the organization can respond more quickly to changing circumstances on the ground.

*Disadvantages:* The disadvantages of the area structure are similar to those of the product structure. Economies of scale will be harder to achieve as different localities develop and implement very different product strategies on one hand, and invest resources in developing local functional expertise and effort which may well be duplicated unnecessarily across geographic units.



**Exhibit 3.6:** Area/geographic structure

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### 3.2.1.5 Matrix structure:

A matrix structure is often adopted in organizations that would like to optimize decisions across multiple organization dimensions. In other words, they would like to achieve economies of scale where appropriate, but do not want to lose the ability to respond to product/customer and geographic needs more effectively.

A matrix organization simultaneously utilizes two or more dimensions (product, geographic, function, etc.) to organize the company's work. In this case, two or more dimensions may have direct links to the head of the organization (see here<sup>4</sup>) and key individuals throughout the organization may actually report to more than one dimension. As can be seen in here<sup>5</sup>, the orange juice product manager reports to the head of the organization, as does the head of the finance function. In this example, the finance officer in the orange juice product group reports to two individuals: the head of finance and the head of the orange juice group. At the same time, a geographic dimension may require that the function and product heads interact as coequals with any number of country managers or regional heads as well.

*Advantages:* The matrix allows functional efficiencies to be achieved while also allowing for the management of discrete product lines. Product managers remain focused on specific customer and product issues, yet can tap into the specialized support systems offered by strong functions. Where a geographic dimension is included in the structure, country managers or other local personnel can devote their attention to the development of location specific strategies. Communication and information sharing may be facilitated through the multiple dimensions.

*Disadvantages:* The matrix is complex and often involves additional coordination costs. Confusion and ambiguity may result from multiple reporting relationships as a single individual may receive conflicting direction from their various supervisors.

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<sup>4</sup>"International business for the entrepreneur: Introduction", Exhibit 1  
<<http://cnx.org/content/m35588/latest/#id4387077>>

<sup>5</sup>"International business for the entrepreneur: Introduction", Exhibit 1  
<<http://cnx.org/content/m35588/latest/#id4387077>>

**Exhibit**

	Toothpaste	Soap	Orange Juice	Batteries
North America				
South America				
Europe				
Asia				

**Table 3.1:** Matrix Structure**3.2.1.6 Beyond the matrix:**

Each of the above organizational choices clearly offers advantages and disadvantages.

While some type of hierarchy exists at the heart of most organization designs, many organizations are finding that the typical pyramid shaped organization no longer meets their needs. They are looking for options that allow greater flexibility and responsiveness. Such organizations may legitimize informal relationships between various organizational parts and levels. They may rely more on teams as coordinating mechanisms and they may actively encourage collaboration and sharing across business units. Successful global organizations in the 21st century will balance hierarchical control (which remains critical in most organizations) on one hand, with less rigidity, more flexibility and emphasis on individual empowerment on the other.

**3.2.1.7 Staffing choices in a globally far-flung company**

Staffing choices in a far-flung global company are more complex as well. Issues of cost, cultural savvy, familiarity with local conditions, language skill, family issues, and more must all be considered carefully as staffing decisions are made. In addition to many of the standard human resources challenges that inevitably arise, determining where employees will be sourced from represents one of the most important decisions facing companies as they set up operations abroad. In general, employees may come from any of the following sources: the headquarters (home) country, the host (local) country, or a third country (neither home, nor host). These choices are outlined briefly below.

**Ethnocentric staffing** involves staffing overseas positions with home country personnel. These “expatriates” are usually assigned to fairly senior or technical positions in the overseas organization. An example of this staffing choice would be when a Japanese company sets up an office in the United States and sends a Japanese executive from their headquarters in Tokyo to staff the new office in Chicago.

**Advantages:** Home country staff, when sent overseas, are familiar with the home country operations and culture. Because of this, they may be able to better communicate with headquarters, access needed resources, and tap into a home-country network. In addition, the home country may know these people well from past collaboration that can lead to high levels of trust and confidence between the parties. Familiarity with the company often means that these individuals bring special company-specific expertise along with them, as well as technical skills and knowledge related to the company’s product offering. They may also bring general technical, or managerial skills that may be in short supply in the host country. Ethnocentric staffing offers the additional benefit of building a global mindset among the home country workforce. Those individuals who are sent overseas as expatriates will often return home with a more globalized perspective.

**Disadvantages:** Home country employees are expensive. Many companies estimate that sending an expatriate overseas costs about 2-5 times their annual salary. This means that sending an executive and their family overseas can cost hundreds of thousands of dollars or more per year. The home country employee is usually less familiar with the local culture and employment conditions, and the employee and the family may find it hard to adapt to the new local living and working conditions. In fact, according to widely



cited research, failure of the spouse and of the family to adapt to local cultural differences are two of the most frequent reasons that an employee assigned to an overseas post will fail to complete their assignment. Ethnocentric staffing practices are also sometimes criticized for preventing talented local employees from filling the positions held by expatriates.

**Polycentric staffing** involves hiring local personnel to fill needed overseas positions. For example, under this model, a South African company setting up an office in Brazil would hire a Brazilian to fill an open position.

**Advantages:** A polycentric staffing strategy is much less expensive than the ethnocentric model. Relocation costs are usually much lower and a standard compensation package consistent with the local market is usually sufficient. Local employees are usually more familiar with the local culture and language and may have access to networks and relationships with local stakeholders.

**Disadvantages:** Talent is often short in host countries. Lack of familiarity with the home country conditions, culture and language may become a barrier to effective communication with the headquarters staff. Lack of familiarity with headquarters operations may make it difficult for the local staff to access needed resources and assistance.

**Geocentric staffing** involves staffing a location without regard for the employees' place of origin. Companies simply scan their global workforce for the best qualified candidate to fill a position. In this model, a Chinese company might fill a position in their Mexico office with an employee from the United Kingdom.

**Advantages:** The geocentric model offers the most employment flexibility and choice to the company. The company can search the entire global workforce to find the most qualified candidate for a certain position. Opportunities for cross-cultural development are extended to company employees no matter which country they come from. The additional global interaction taking place can foster teamwork across countries and a better cross-border understanding of company operations. A cadre of globally savvy employees with experience in multiple company locations can be a powerful asset as the company continues to seek additional overseas opportunities.

**Disadvantages:** Geocentric staffing can be as expensive as ethnocentric staffing practices. Employees and families often have to be relocated across country boundaries and long distances. Geocentrically placed employees may be unfamiliar with local practices.

**Regiocentric staffing** involves staffing within a global region. In this case, a Korean company might fill a position in Italy with a Spanish employee.

**Advantages:** Moves are often made over shorter distances as employees are relocated. Cultural and linguistic differences may be less pronounced. Employees gain the benefits of cross-cultural experience as they work outside their home country.

**Disadvantages:** Costs of relocation often remain fairly high. While cross-cultural perspective is built, a truly global perspective may still be lacking. It is also important to note that cultural and language differences will often be significant factors even within region.

All of the above models have strengths and weaknesses which must be seriously considered. In most companies with multiple employees in overseas locations a mixed strategy will often make the most sense both in terms of efficiency and effectiveness. A few select positions may best be filled with either home country or third country nationals while the vast majority of employment positions are usually filled by local employees. Because cross-cultural difference will be encountered in almost any overseas staffing configuration, significant investment in cross-cultural skills training will be extremely valuable.

### 3.2.1.8 Trends and challenges in a global HR environment

HR leaders in the 21st century will be challenged to address a number of issues to ensure availability of skilled staff, regardless of which staffing option the MNC pursues. As the global environment continues to develop, MNCs are challenged to address the shortage in global skills and cross-cultural communication barriers. The successful MNC will be able to adapt to the changing environment by globalizing their HR systems and function, and globalizing the workforce mindset. These efforts must also be aligned with business and organizational objectives and will require HR professionals to adopt a new way of thinking to identify and implement new ways of getting work done.

HR systems in the MNC must be aligned with global business imperatives both in terms of pay and performance systems. As the number of overseas transfers increases, MNCs must look to develop general policies and compensation packages rather than negotiating these on a case-by-case basis in order to obtain efficiency and consistency of process. Systems must also be in place for succession planning on a local level as well as a global level. Currently many MNCs are not operating an effective expatriate pipeline, either not sending the most effective individuals to host countries or failing to repatriate them effectively. The trend towards increasing reliance on integrated systems should contribute to better access across borders and regions to better serve expatriate relocation and business decisions.

Another opportunity for MNCs in regards to creating a global workforce will be to standardize and revisit current expatriate compensation packages to include soft benefits. Until now, individuals have often not been willing to take positions abroad because the incentives are solely financial. Historically, systems have not been in place to repatriate smoothly the individual and family following completion of their overseas assignment. Many employees find themselves out of their home HR system, and therefore are not made aware of possibly enticing job opportunities at home. This can be improved greatly simply by creating alignment and communication between the home and international HR department.

### 3.3 Selecting and managing your team - Competitive advantage through human resource management<sup>6</sup>

*An introduction, by Cynthia V Fukami*

A great deal of recent research has underscored the strategic advantage to be gained from managing employees as if they are assets rather than commodities. Consider the commodities a business employs—pads of paper, ballpoint pens—things that you purchase, use up, and then discard. Investing in a commodity is never considered—refilling a ballpoint pen, for a simple example—because it simply is not worth the expenditure of time and resources. A return on that investment is not expected. On the other hand, consider the assets employed in business—the physical plant, the equipment, and the money—things that are maintained and developed. When the paint peels on the office walls, one does not throw away the building and build a new one; a new coat of paint is sufficient. Making investments in a business's assets makes a great deal of sense, because these investments will bring a return. A growing number of companies, recognizing that their employees are among their most valuable assets, are backing up that recognition with solid investment.

In an important recent book, Professor Jeffrey Pfeffer of Stanford University identified seven management practices that have been associated with producing sustained competitive advantage for the companies that have adopted them. These practices are: employment security, selective hiring, self-managed teams with decentralized authority, high pay contingent on organizational performance, training, reduced status differences, and sharing information. Put together, these practices form the foundation of what is called a “high-commitment” or a “high-performance” management system.

The evidence on the results of implementing a high-commitment management system is striking and strong. Research has been conducted in many industries, from banking to automotive to semiconductors to service. Some research has focused on one industry while others have looked across industries. Some research has included companies from the United States and others have studied companies abroad. Overall, the conclusions of these studies are remarkably similar. High-commitment management systems produce higher organizational performance. Pfeffer summarizes the results into three categories. First, people work harder because they have more control over their work from the high-commitment management practices. Second, people work smarter because they have stronger skills and greater competence from the investments of high-commitment management practices. Third, companies save administrative overhead and the costs by reducing the alienation of their workforce and the adversarial relationship with management.

In a study of firms representing all major industries, Mark Huselid found that a one standard-deviation increase in the use of high-commitment practices was associated with a 7.05 per cent decrease in employee

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<sup>6</sup>This content is available online at <<http://cnx.org/content/m35386/1.4/>>.

turnover, a USD 27,044 per-employee increase in sales, USD 18,641 more in market value per employee, and USD 3,814 more in profits per employee. When he repeated the study several years later, he found that a similar increase in the use of high-commitment management practices was associated with a USD 41,000 increase in shareholder value per employee.

Another noteworthy study examined the management practices of initial public offerings or IPOs to see if there was a relationship between high-commitment management practices and the five-year survival rate of IPOs. This study concluded that the treatment of employees as assets and the use of stock options, profit sharing and gain sharing programs for all employees (versus limiting the programs to key executives) were significantly related to the survival of the IPO to the five-year milestone.

These studies, and many others like them, have put conventional wisdom on its ear. Typically, we have assumed that success was related to factors such as size, or being global, or leading your market, or being in particular industries such as high tech, or pursuing a brilliant strategy. Yet, research shows there is virtually no connection between industry and success. As Wal-Mart and Southwest Airlines have shown us, an individual business can be very successful in a terrible industry. Similarly, there is little or no connection between success over time and company size or market dominance. Instead, competitive advantage comes from the way business is conducted, and employees are the keys to this. The most successful companies manage their workforce effectively as assets not commodities.

So why are more companies not adopting high-commitment management practices? Why are their executives proclaiming employees to be their most valuable assets, while continuing to treat them as commodities? Perhaps it is a continual cultural emphasis on short run performance and stock prices—an emphasis that makes it seem more profitable to lay off employees or to cut training when times are tough. Perhaps it is a preoccupation with systems that control rather than delegate. Perhaps it is our overwhelming tendency to teach future managers technical tools at the expense of people-management tools. Whatever the reasons, the challenge remains. If a business is able to meet that challenge, the odds are that competitive advantages will follow.

## 3.4 Selecting and managing your team - Performance appraisal<sup>7</sup>

*By Adam Ruberg*

### 3.4.1 Purpose of appraisals

Historically, performance appraisals have been used by companies for a variety of different purposes, including salary recommendations, promotion and layoff decisions, and training recommendations (Kulik, 2004). In general, “performance elements tell employees what they have to do and standards tell them how well they have to do it” (United States Department of the Interior, 2004). This broad definition, however, can allow for appraisals to be ineffective, even detrimental, to employee performance. Second only to firing an employee, managers cite performance appraisal as the task they dislike the most, and employees generally have a similar disposition (Heathfield, Performance Appraisals Don’t Work). One key item that is often forgotten during the appraisal process (by managers and employees alike) is that the appraisal is for improvement, not blame or harsh criticism (Bacal, 1999).

### 3.4.2 Creating an appropriate appraisal process

One significant problem in creating an appraisal process is that no single performance appraisal method will be perfect for every organization (Kulik, 2004). Establishing an appropriate process involves significant planning and analysis in order to provide quality feedback to the employee. The most crucial task in the process is determining proper job dimensions that can be used to gauge the employee against accepted standards that affect the performance of the team, business unit, or company (Fukami, Performance Appraisal, 2007). Peter Drucker developed a method termed ‘Management by Objectives’ or MBO, in order to address

<sup>7</sup>This content is available online at <<http://cnx.org/content/m35408/1.4/>>.

the creation of such job dimensions. Drucker suggests that the objectives of any employee can be validated if they pass the following six tests (Management by Objectives—SMART, 2007):

- Specific
- Measurable
- Achievable
- Realistic
- Time-related

If an objective meets these criteria, it is considered a valid dimension on which to gauge performance. The standards on which the objective is compared with should also be validated using the SMART method.

### 3.4.3 Appraisal methods

Numerous methods exist for gauging an employee's performance, and each provides strengths and weaknesses for given environments. The following outlines some of the more commonly used methods, as well as some recently developed ones that can be useful for various feedback situations:

**Graphic rating scales:** This method involves assigning some form of rating system to pertinent traits. Ratings can be numerical ranges (1-5), descriptive categories (below average, average, above average), or scales between desirable and undesirable traits (poor ↔ excellent). This method can be simple to setup and easy to follow, but is often criticized for being too subjective, leaving the evaluator to define broad traits such "Leadership ability" or "Conformance with standards" (Kulik, 2004).

**Behavioral methods:** A broad category encompassing several methods with similar attributes. These methods identify to what extent an employee displays certain behaviors, such as asking a customer to identify the usefulness of a sales representative's recommendation. While extremely useful for jobs where behavior is critical to success, identifying behaviors and standards for employees can often be very time consuming for an organization (Kulik, 2004).

**2+2:** A relative newcomer in performance appraisal methodology, the 2+2 feedback system demonstrates how appraisals can be used primarily for improvement purposes. By offering employees two compliments and two suggestions for improvement focused around high-priority areas, creators Douglas and Dwight Allen suggest that organizations can become "more pleasant, more dynamic, and more productive" (Formula 2+2, 2004). If the goal of the performance appraisal is employee improvement, this system can provide significant benefits; however, if the goals are more akin to compensation changes and rankings, the system provides little benefit.

Appraisal methodologies depend greatly on the type of work being done; an assembly worker will require a considerably different appraisal system than a business consultant. Significant planning will be required to develop appropriate methods for each business unit in an organization in order to obtain maximum performance towards the appraisal goals.

### 3.4.4 Performing the appraisal

Performing an appraisal on employees can be nerve racking for both parties if the situation is not handled correctly, and is thus seen as one of the most difficult tasks managers face. There are many acts a manager can perform to make the process easier on both parties, and hopefully, mutually beneficial.

Many assume that performance appraisals are meant to identify weaknesses to be worked on, and exposing these weaknesses can be painful for employees. Martha Craumer suggests that organizations should be leveraging the strengths of each employee rather than focusing on their weaknesses. By "encouraging and developing what people do well naturally...the organization could become more efficient by allowing their people to do what they do best" (Craumer, 2001).

The frequency of appraisal can be a notable factor in ongoing development. Yearly performance reviews are becoming increasingly rare as companies begin to see the benefits of frequent appraisal. Susan Heathfield suggests that quarterly performance development meetings can allow for clear direction towards performance

goals (Heathfield, Performance Management is NOT an Annual Appraisal). Constant tuning of performance can be much more effective than annual overhauls.

Any individual administering performance appraisals must realize the two-way conversation that is occurring. Inviting feedback and listening to reactions and concerns from the employee during the appraisal process becomes very important to establishing trust with the employee (United States Department of the Interior, 2004). If the appraiser provides any negative feedback or improvement points, suggestions should be made to help resolve the problem to develop the person's performance. With the suggestions made, follow-up should occur to assist with any problems with the development and to track progress, rather than waiting until the next performance review (Fukami, Performance Appraisal, 2007).

Often being seen as a strictly hierarchical feedback tool, performance appraisals can be less "scary" if employees have the opportunity to appraise their managers as well as their peers. With this 360-degree feedback process, employees and managers will see multiple vantages of their performance and can participate on an even playing field, ultimately providing a greater ability to work together to achieve corporate goals (Kulik, 2004).

Performance appraisals should not be looked upon as a necessary evil, but rather a process that has the ability to develop and improve the people within the company. By taking the time to create appropriate performance measures, and administering them accordingly, the resulting system can provide long-term gain for the company.

For further investigation:

For a discussion of why many people think of feedback as criticism visit:

<http://www.selfhelpmagazine.com/articles/growth/feedback.html><sup>8</sup>

For a discussion of differing views on feedback and specific examples on how to give feedback visit:

<http://home.att.net/~nickols/feedback.htm><sup>9</sup>

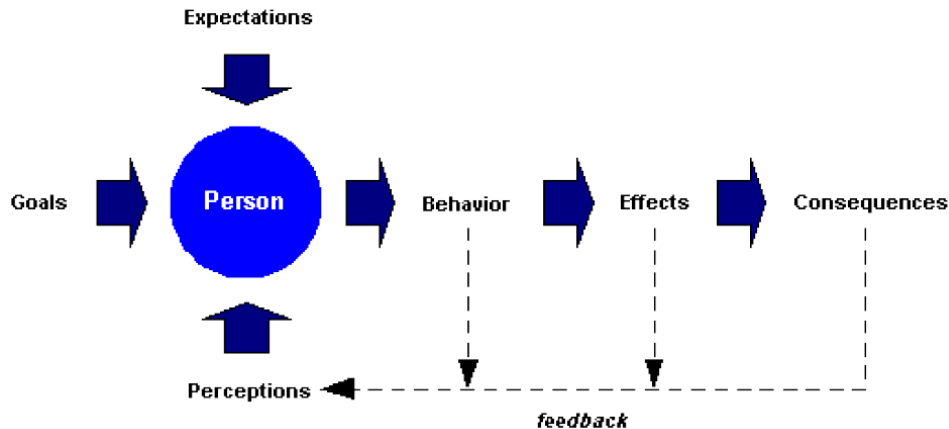
### 3.4.5 Giving and receiving feedback

*By Kristin Hamilton and Tiffani Willis*

In a broad sense, **feedback** is simply verbal or nonverbal communication between two or more parties. So, why are so many of us afraid of the word feedback? People often think of feedback as being synonymous with criticism because feedback is given, in most circumstances, when expectations have not been met (Rich). As humans, we all have the desire to fit in with our society's social norms and please those within our community by meeting expectations. As shown in Exhibit 3.7, we are constantly surrounded by feedback as we see the consequences of our actions and how our actions affect the impressions of those around us (Jossey and Bass, 1995). Feedback is an essential part of our personal life and our work environment, making, giving and receiving feedback successfully critical.

<sup>8</sup><http://www.selfhelpmagazine.com/articles/growth/feedback.html>

<sup>9</sup><http://home.att.net/~nickols/feedback.htm>



**Exhibit 3.7:** Feedback

### 3.4.6 Giving feedback

Many are not aware that giving successful feedback is affected by more than just the words used to communicate. Words used to tell ideas are only “7 per cent of your communication, your tone of voice comes out to 38 per cent and your gestures are equivalent to 55 per cent of your total communication” (Hathaway). As a result, the effectiveness of communication is related to how well one mirrors the culture and behaviors of the person to which one is talking. Matching a person’s voice tone, tempo, body posture, movements, and gestures creates a feedback environment where the ideas being communicated are easily understood.

In addition to mirroring the person you are communicating with, there are nine easy steps that can be followed when giving feedback. First, be clear about what you have to say. Second, emphasize the person’s ability to change in a positive way. Third, avoid general comments and clarify pronouns such as “it” and “that” so the person understands exactly what you are attempting to communicate. Fourth, make sure to pick the right time. Fifth, focus on the behavior that can be changed rather than the person or your opinions (Meister). Sixth, be descriptive rather than evaluative. Seventh, own the feedback by using “I statements” that clarify your feelings related to the person you are giving feedback to. Eighth, avoid generalization words such as “all”, “never”, “always” etc.; rather, use more specific examples of the behavior you are trying to change or encourage in the future. Ninth, to ensure mutual understanding after giving feedback, ask the person you are communicating with to restate their understanding of the issue being discussed (McGill & Beatty, 1994).

When thinking about feedback in an organization, it is likely a person will think of performance reviews. One common problem that managers overlook when reviewing performance is remembering that feedback is not all about forms. Traditional performance reviews have checklists, ratings or reports that are used as tools to analyze feedback in the organization. While these forms are useful in documenting and appraising a person’s performance, feedback should not be dictated by the type of form an organization uses. Performance appraisals are often given at benchmarked times throughout the year. As a result, feedback is often delayed. Increased amounts of time that pass between the time the behavior took place and the time the recipient receives the feedback greatly affects the recipients ability to accept the feedback as useful information.

In one’s personal life and in the work environment, it is important to understand that feedback is something that can be asked for. As such, the giver and receiver of feedback are equally accountable for communicating the need and desire to give and receive feedback. Finally, it is important to ask for comment on the way one gives feedback because most humans are great at self-delusion. It is much easier to think

that our suggestions are useful to another person than to actually understand how our feedback is being interpreted by another. In the end, feedback is a continuous process which ensures goals and expectations are being met through communication between two parties.

### 3.4.7 Receiving feedback

While giving feedback is extremely important, receiving feedback and changing one's characteristics to reflect that feedback is just as important. Often, employees become defensive when they are receiving feedback on their performance. Ken Blanchard, co-author of *The One Minute Manager* states, "[t]he reason a lot of people get defensive with feedback is they don't distinguish feedback from reaction. While they are listening to the feedback, they have a reaction to the demand for action that your feedback implies" (Blanchard, 1996). For example, when a boss is telling an employee the aspects of the job the employee needs to work on, he may only focus on the negative points and not the positive.

Receiving feedback should not only be looked at from a downward point of view, such as a boss giving his employees critiques; but it should also be studied in an upward way. According to Richard Reilly, James Smither, and Nicholas Vasilopoulos, authors of *A Longitudinal Study of Upward Feedback*, "upward feedback (that is, subordinates rating the performance of their immediate supervisor) is growing in importance as a tool for the individual and organizational development" (1996). Upward feedback allows management to see the effects they have on their employees. It is then up to the managers to act on that feedback. Atwater, Roush and Fischthal found that "follower ratings of student leaders improved after feedback was given to leaders and that leaders receiving 'negative' feedback (defined as self-ratings that were considerably higher than follower ratings) improved the most" (*The Influence of Upward Feedback on Self and Follower Ratings of Leadership*, 1995). This shows that there is a bigger reaction when the upward feedback is negative instead of positive.

In order to effectively receive feedback, a person has to be ready to understand that they may hear critiques that they do not want to hear. Jan B. King, the former President and CEO of Merritt Publishing states that an individual is ready to receive feedback when he:

- wants to know him as others see him and he is clear that this is their perception, not necessarily what is true about you inside.
- trusts his co-workers to care enough about his development to risk hearing their opinion.
- has a place outside work where you can talk it through.
- Has opportunities for additional feedback so he gets validation of the changes he has made (*Receiving Feedback Gracefully is a Critical Career Skill*).

If an individual is not ready to constructively receive feedback, then the feedback he does receive will not be effective. King continues to state that individuals must remember this about feedback, "it is one opinion coming from another individual's unique perspective" (*Receiving Feedback Gracefully is a Critical Career Skill*). Just because one person views another individual in a particular way does not mean that the rest of world views that person in the same way, but it is a good way for an individual to find out what others think of him/her that is not known.

There are several tips that an individual can use when receiving feedback. These tips include:

- Try to show your appreciation to the person providing the feedback. They will feel encouraged and believe it or not, you do want to encourage feedback.
- Even your manager or supervisor finds providing feedback scary. They never know how the person receiving feedback is going to react.
- If you find yourself becoming defensive or hostile, practice stress management techniques such as taking a deep breath and letting it out slowly.
- Focusing on understanding the feedback by questioning and restating usually defuses any feelings you have of hostility or anger.

- If you really disagree, are angry or upset, and want to dissuade the other person of their opinion, wait until your emotions are under control to reopen the discussion (Heathfield, How to Receive Feedback with Grace and Dignity).

These tips are helpful in becoming a better receiver for feedback, but they will only work as long as they are practiced on a regular basis.

With the above facts and figures workers can see that giving and receiving feedback does not have to be scary. As long as people give and receive feedback in a constructive way and practice their feedback skills it will eventually become second nature to the employees. It will also show that feedback provides benefits for both the individuals that work for the company, and the company itself.

For further investigation:

For information on Ken Blanchard, his Book *One Minute Manager*, and various facts on feedback visit:  
<http://www.answers.com/topic/ken-blanchard><sup>10</sup>

For more information on the findings of “A longitudinal study of upward feedback” visit:  
<http://www.blackwell-synergy.com/doi/abs/10.1111/j.1744-6570.1996.tb01586.x><sup>11</sup>

Link your knowledge:

Click on this link to find an exercise to practice effective ways to receive feedback:

<http://humanresources.about.com/cs/communication/ht/receivefeedback.htm><sup>12</sup>

### 3.5 Selecting and managing your team - Aligning employee career development with organizational growth<sup>13</sup>

By Rahul Choudaha

*Work is such a cozy place that it's sometimes difficult for Google employees to leave the office. . .*

(Lashinsky, 2007).

We all can predict at least one thing about the future of businesses—competition will increase. However, the direction of competition will not only be for customers, but also for talent. Satisfied talent will attract more customers and in turn will keep them satisfied. Losing talent in an era of talent scarcity is the last thing an organization wants. Especially for small and medium enterprises, criticality and dependability on the talent is much higher. Schwyer makes a case for improving the retention strategies within the organization because winning the internal war for talent is as critical as losing a top performer and leads to general employee dissatisfaction. “Successful talent management inside an organization sets in motion a virtuous cycle. Through word of mouth it becomes known as a great place to work. This reduces the external war for talent to mere skirmishes in which talent will almost always choose the top employer” (An Internal War for Talent, 2006).

Recruiting and selecting the right talent is the first stage, and identifying talent which fits into company's needs and values is critical. Subsequently, the challenge for the organization is to keep the talent and consistently motivate them to over deliver. Baruch examines transforming models of career management, arguing that there is a general shift in career trajectories from linear to multidirectional trajectories (Transforming Careers from Linear to Multidirectional Career Paths, 2004). In this new model, workers' experience of career development and progression does not follow a traditional linear model of moving up organizational hierarchies. The multidirectional career model suggests that as the individual career trajectories gain multiple direction and possibilities, workers are exposed to greater diversity of relationships, involving cross-functional, inter- and intra-organizational and multi-level encounters which transform the landscape of relationships involved in career experiences.

<sup>10</sup><http://www.answers.com/topic/ken-blanchard>

<sup>11</sup><http://www.blackwell-synergy.com/doi/abs/10.1111/j.1744-6570.1996.tb01586.x>

<sup>12</sup><http://humanresources.about.com/cs/communication/ht/receivefeedback.htm>

<sup>13</sup>This content is available online at <<http://cnx.org/content/m35399/1.4/>>.



### 3.1: Best of East and West

Google was ranked number 1 in the Fortune 100 Best Companies to Work For. Google receives almost 1,300 resumes every day. The biggest challenge for Google is not how to attract the best talent but how to retain them and keep them excited. Google provides innumerable perks at the office like free meals, free professional advice on health and finance, childcare, shuttle services, gym etc. Google provides two key opportunities for career development. First, engineers are required to devote 20 per cent of their time to pursuing projects of their interests which are in alignment with organizational goals. Second, Google is exploring a sabbatical program and mobility within the company for the developing and retaining talent.

TCS was ranked the number 1 technology company in the DQ-IDC India Survey: Best Employers. This is not an easy achievement considering size of TCS and its philosophy of being one of the moderate pay masters. TCS has over 70,000 employees, and earned global revenue of USD 4.3 billion (2006-07). The key to success is the learning culture that the organization promotes. The organization has adopted a two-prong strategy for developing talent. First, continuous learning through technology: TCS has launched iCALMS, an integrated competency and learning management system. Second, providing global assignments to employees and hence enabling a route for professional and financial growth (Dataquest, 2006).

The career development programs should provide excitement and satisfaction at various stages of employee development. Marshall highlighted that leadership development programs for small organizations should identify the talent early on and provide multiple opportunities of learning by job rotation (Leadership Development for Small Organizations, 2002). These development programs should also leverage the internal talent, who are already experts in their fields for creating inspiration and developing the next chain of leaders. Komisar shared his experiences and mentioned that a passion-driven career has major virtues and ample learning opportunities. This is good for the organization as they know that employee is enjoying the work, and finally it provides fluidity and flexibility in the ever-changing landscape of the new economy (Goodbye Career, Hello Success, 2000).

The changing nature of careers and organizations has increased the significance of mentoring. It benefits and strengthens employer-employee relationship. Mentoring can be accomplished by immediate superiors, peers within one's own organization, individuals outside of one's organization, subordinates, and any number of other individuals (Baugh & Sullivan, 2005). Michaels, Handfield-Jones, and Axelrod in their book *The War for Talent* mentions that talent development is critical for organizations and many think development means training, but training is only a small part of the solution (2001). They suggest that development primarily happens through a sequence of stretch jobs, coaching, and mentoring. However, organizations are not leveraging the development opportunities. Companies need to adopt and accelerate development by improving the frequency and candor of feedback and institutionalizing mentoring. Every leader at all levels can and should be responsible for people development.

Hymowitz says that managers are not spending adequate time in understanding their team members and providing them with opportunities to learn and grow on the job (When Managers Neglect to Coach Their Talent, 2007). This is leading to employees feeling alienated, underutilized and ignored, and may be searching for new jobs elsewhere. Managers who focus on talent assign their employees to jobs that play to their strengths, make sure they have the resources they need to perform well, respect their opinions and push them to advance (Hymowitz, 2007). The people manager should develop relationships and an environment that is conducive to development. Five skill areas that successful developers of people have mastered are:

- encouraging an open climate for dialogue with employees
- providing employees with on-going feedback regarding performance
- helping employees understand the strategies of the organization
- helping employees identify multiple and realistic options for their career growth and development within the enterprise
- helping employees compile meaningful, business-driven personal development plans (Kaye & Vultaggio, 2004)

“...[I]n the new career model, employees make major shifts within the same company, or exit and reenter the company at different career stages” (Kulik, 2004). Organizations need to realize that talent is precious and dynamic. Organizations need to create action strategies and provide a favorable environment to help talent grow in line with the organizational goals.

### 3.6 Selecting and managing your team - References<sup>14</sup>

- Accel Team. (n.d.). Job Design. Retrieved May 17, 2007, from Accel Team: [http://www.accel-team.com/work\\_design/wd\\_03.html](http://www.accel-team.com/work_design/wd_03.html)<sup>15</sup>
- Adams, S. (2002). Dilbert. Retrieved May 18, 2007, from <http://pag.csail.mit.edu/~adonovan/dilbert/show.php?day=17&month=03&year=2002><sup>16</sup>
- Allen, D., & Allen, D. (2004). *Formula 2+2*. San Francisco: Berrett-Koehler Publishers, Inc.
- Ashghian, P., & Ebrahimi, B. (2005). *Global Business: Environments, Strategies, and Operations*. San Bernardino, CA: Globe Academic Press.
- Atwater, L., Roush, P., & Fischthal, A. (1995). The Influence of Upward Feedback on Self and Follower Ratings of Leadership. *Personnel Psychology*, 35-59.
- Bacal, R. (1999). Ten Stupid Things Managers Do to Screw Up Performance Appraisal. Retrieved May 18, 2007, from Work911.com: <http://www.work911.com/performance/particles/stupman.htm><sup>17</sup>
- Baruch, Y. (2004). Transforming Careers from Linear to Multidirectional Career Paths. *Career Development International*, 58-73.
- Baugh, S., & Sullivan, S. (2005). Mentoring and Career Development. *Career Development International*, 425-428.
- Becker, B., & Huselid, M. (2001). The Strategic Impact of HR.
- Beer, M., Spector, B., Lawrence, P., Mills, D., & Walton, R. (1984). *Managing Human Assets*. New York: The Free Press.
- Blanchard, K. (1996). Feedback Facts. *Incentive*, 59.
- Canadian Centre for Occupational Health & Safety. (2002). What is "Job Design?". Retrieved May 17, 2007, from CCOHS: [http://www.ccohs.ca/oshanswers/hsprograms/job\\_design.html](http://www.ccohs.ca/oshanswers/hsprograms/job_design.html)<sup>18</sup>
- Case, J. (1997). What Can You Learn from Open-Book Management? *Harvard Management*, 3-5.
- Center for Advanced Human Resource Studies. (1999). Waging the War for Talent. *HR Spectrum*, 1-4.
- Central Parking Corporation. (2004). Communication Policy. Retrieved May 17, 2007, from Central Parking: <http://www.parking.com/people/communicationpolicy.aspx><sup>19</sup>
- Centrelink. (n.d.). Centrelink. Retrieved May 2007, from Centrelink: <http://www.centrelink.gov.au/><sup>20</sup>
- Clarkson, K. (2004). *West's Business Law*. Mason: Thompson Learning.
- Craumer, M. (2001). How to Coach Your Employees. *Harvard Management Communication Letter*.
- Creating Situational Interviews and Rating Scales. (n.d.). Retrieved May 15, 2007, from [http://www.hrtoolkit.gov.bc.ca/staffing/staffing\\_steps/assess\\_methods/oral\\_interviews/situational\\_samples.htm](http://www.hrtoolkit.gov.bc.ca/staffing/staffing_steps/assess_methods/oral_interviews/situational_samples.htm)<sup>21</sup>
- Dataquest. (2006). The Top 10: 1-TCS: A Giant on Top. Retrieved May 3, 2007, from Dataquest: <http://dqindia.ciol.com/makesections.asp/06090619.asp><sup>22</sup>
- Dessler, G. (2004). *Framework for Human Resource Management*. Upper Saddle River: Pearson Prentice Hall.

<sup>14</sup>This content is available online at <<http://cnx.org/content/m35417/1.4/>>.

<sup>15</sup>[http://www.accel-team.com/work\\_design/wd\\_03.html](http://www.accel-team.com/work_design/wd_03.html)

<sup>16</sup><http://pag.csail.mit.edu/~adonovan/dilbert/show.php?day=17&month=03&year=2002>

<sup>17</sup><http://www.work911.com/performance/particles/stupman.htm>

<sup>18</sup>[http://www.ccohs.ca/oshanswers/hsprograms/job\\_design.html](http://www.ccohs.ca/oshanswers/hsprograms/job_design.html)

<sup>19</sup><http://www.parking.com/people/communicationpolicy.aspx>

<sup>20</sup><http://www.centrelink.gov.au/>

<sup>21</sup>[http://www.hrtoolkit.gov.bc.ca/staffing/staffing\\_steps/assess\\_methods/oral\\_interviews/situational\\_samples.htm](http://www.hrtoolkit.gov.bc.ca/staffing/staffing_steps/assess_methods/oral_interviews/situational_samples.htm)

<sup>22</sup><http://dqindia.ciol.com/makesections.asp/06090619.asp>

Dorenbosch, L., van Engen, M., & Verhagen, M. (2005). *On-the-Job Innovation: The Impact of Job Design and Human Resource Management Through Production Ownership*. In *Creativity and Innovation Management* (pp. 129-141). Blackwell Publishing Limited.

Duening, T., & Ivancevich, J. (2003). *Managing Organizations*. Cincinnati, OH: Atomic Dog Publishing.  
Employee Benefit. (n.d.). Retrieved May 2007, from Wikipedia:  
[http://en.wikipedia.org/wiki/Employee\\_benefit](http://en.wikipedia.org/wiki/Employee_benefit)<sup>23</sup>

Employee Benefits Definition. (n.d.). Retrieved 2007, from BusinessDictionary.com:  
<http://www.businessdictionary.com/definition/employee-benefits.html><sup>24</sup>

Employee Benefits Magazine. (n.d.). Retrieved May 2007, from <http://www.employeebenefits.co.uk/><sup>25</sup>

Employee Recruitment: How to Hire the Right People. (1999). Retrieved 14 2007, May, from  
<http://www.truckstoptravelplaza.com><sup>26</sup>

Employment Case Law Headlines. (n.d.). Retrieved May 19, 2007, from EEO News:  
<http://www.eeonews.com/news/adea/index.html><sup>27</sup>

Falcone, P. (2002). *The Hiring and Firing Question and Answer Book*. New York: AMACOM.

FindLaw.com. (n.d.). *Illegal Reasons for Firing Employees*. Retrieved May 18, 2007, from FindLaw:  
<http://smallbusiness.findlaw.com/employment-employer/employment-employer-ending/><sup>28</sup>

Free Sample Behavioral Interview Questions. (n.d.). Retrieved May 15, 2007, from QuintCareers.com:  
[http://www.quintcareers.com/sample\\_behavioral.html](http://www.quintcareers.com/sample_behavioral.html)<sup>29</sup>

Friedman, T. (2006). *The World is Flat*. New York: Farrar, Straus, and Giroux.

Fukami, C. (2007, May 1). *Performance Appraisal*. Lecture. Denver, CO, USA: University of Denver; Daniels College of Business.

Fukami, C. (2007). *Reward Systems*. Lecture. Denver, CO, USA: University of Denver; Daniels College of Business.

Fukami, C. (2007, April). *Strategic Human Resources: Training*. Class Lectures. Denver, CO, USA: University of Denver—Daniels College of Business.

Garvin, D., & Roberto, M. (2001). *What You Don't Know About Making Decisions*. Harvard Business Review.

Ghemawat, P. (2007). *Managing Differences; The Central Challenge of Global Strategy*. Harvard Business Review, 59-68.

Godwin, J., Neck, C., & Houghton, J. (1999). *The Impact of Thought Self-Leadership on Individual Goal Performance*. *Journal of Management Development*, 18, 153-170.

Golan, P. (2003). *All Talk But No Voice: Employee Voice at the Eurotunnel Call Centre*. *Economic and Industrial Democracy*, 509-541.

Graham, S. (2006). *Diversity: Leaders not Labels*. New York: Free Press.

Grossman, R. (2006, December). *Measuring the Value of H*. *HR Magazine*, pp. 44-49.

Hathaway, P. (n.d.). *Powerful Communication Skills that Get Results!* Retrieved May 21, 2007, from  
<http://www.thechangeagent.com/communication.html><sup>30</sup>

Heathfield, S. (n.d.). *Discipline (Progressive Discipline)*. Retrieved May 18, 2007, from About.com:  
<http://humanresources.about.com/od/discipline/a/discipline.htm><sup>31</sup>

Heathfield, S. (n.d.). *How to Fire an Employee*. Retrieved May 18, 2007, from About.com:  
[http://humanresources.about.com/od/discipline/a/fire\\_employee.htm](http://humanresources.about.com/od/discipline/a/fire_employee.htm)<sup>32</sup>

<sup>23</sup>[http://en.wikipedia.org/wiki/Employee\\_benefit](http://en.wikipedia.org/wiki/Employee_benefit)

<sup>24</sup><http://www.businessdictionary.com/definition/employee-benefits.html>

<sup>25</sup><http://www.employeebenefits.co.uk/>

<sup>26</sup><http://www.truckstoptravelplaza.com>

<sup>27</sup><http://www.eeonews.com/news/adea/index.html>

<sup>28</sup><http://smallbusiness.findlaw.com/employment-employer/employment-employer-ending/>

<sup>29</sup>[http://www.quintcareers.com/sample\\_behavioral.html](http://www.quintcareers.com/sample_behavioral.html)

<sup>30</sup><http://www.thechangeagent.com/communication.html>

<sup>31</sup><http://humanresources.about.com/od/discipline/a/discipline.htm>

<sup>32</sup>[http://humanresources.about.com/od/discipline/a/fire\\_employee.htm](http://humanresources.about.com/od/discipline/a/fire_employee.htm)

- Heathfield, S. (n.d.). How to Receive Feedback with Grace and Dignity. Retrieved May 16, 2007, from About.com: <http://humanresources.about.com/cs/communication/ht/receivefeedback.htm><sup>33</sup>
- Heathfield, S. (n.d.). Performance Appraisals Don't Work. Retrieved May 21, 2007, from About.com: [http://humanresources.about.com/od/performanceevals/a/perf\\_appraisal.htm](http://humanresources.about.com/od/performanceevals/a/perf_appraisal.htm)<sup>34</sup>
- Heathfield, S. (n.d.). Performance Management is NOT an Annual Appraisal. Retrieved May 21, 2007, from About.com: [http://humanresources.about.com/od/performanceevals/a/perf\\_appraisal.htm](http://humanresources.about.com/od/performanceevals/a/perf_appraisal.htm)<sup>35</sup>
- Heathfield, S. (n.d.). Recruiting Stars: Top Ten Ideas for Recruiting Great Candidates. Retrieved from About.com: <http://humanresources.about.com><sup>36</sup>
- Heathfield, S. (n.d.). Use the Web for Recruiting: Recruiting Online. Retrieved from About.com: <http://humanresources.about.com><sup>37</sup>
- Herzberg's Motivation-Hygiene Theory. (n.d.). Retrieved May 2007, from ChangingMinds.org: [http://instruct1.cit.cornell.edu/courses/dea453\\_653/ideabook1/thompson\\_jones/Taylorism.htm](http://instruct1.cit.cornell.edu/courses/dea453_653/ideabook1/thompson_jones/Taylorism.htm)<sup>38</sup>
- Hobman, E., Bordia, P., & Gallois, C. (2003). Consequences of Feeling Dissimilar from Others in a Work Team. *Journal of Business and Psychology*, 301-325.
- Human Resources. (n.d.). Retrieved April 15, 2007, from Wikipedia: <http://en.wikipedia.org><sup>39</sup>
- Hymowitz, C. (2007, March 20). When Managers Neglect to Coach Their Talent. Retrieved May 3, 2007, from The Wall Street Journal Online: <http://www.careerjournal.com/columnists/inthelead/20070320-inthelead.html><sup>40</sup>
- Internal Revenue Service. (n.d.). What are Employment Taxes? Retrieved May 2007, from Internal Revenue Service: <http://www.irs.gov/businesses/small/article/0,,id=98858,00.html><sup>41</sup>
- Janz, T. (1982). Initial Comparisons of Patterned Behavior Description Interviews Versus Unstructured Interviews. *Journal of Applied Psychology*, 577-580.
- Jones, D. (1997). Employees as Stakeholders. *Business Strategy Review*, 21-24.
- Jossey and Bass. (1995). Feedback About Feedback. Retrieved May 21, 2007, from <http://home.att.net/~nickols/feedback.htm><sup>42</sup>
- Kaye, B., & Vultaggio, P. (2004). The Development-Minded Manager. Retrieved May 3, 2007, from [http://www.careersystemsintl.com/Word per cent20Files/The per cent20Development-Minded per cent20Manager.doc](http://www.careersystemsintl.com/Word%20per%20cent20Files/The%20per%20cent20Development-Minded%20per%20cent20Manager.doc)<sup>43</sup>
- Kerr, S. (1995). An Academy Classic: On the Folly of Rewarding A, While Hoping for B. *Academy of Management Executives*, 7-14.
- King, J. (n.d.). Receiving Feedback Gracefully is a Critical Career Skill. Retrieved May 16, 2007, from [http://www.sideroad.com/Career\\_Advice/receiving-feedback.html](http://www.sideroad.com/Career_Advice/receiving-feedback.html)<sup>44</sup>
- Komisar, R. (2000). Goodbye Career, Hello Success. *Harvard Business Review*, 160-174.
- Kram, K. (1985). *Mentoring at Work: Developmental Relationships in Organizational Life*. Glenview, IL: Scott, Foresman.
- Kulik, C. (2004). *Human Resources for the Non-HR Manager*. New Jersey: Lawrence Erlbaum Associates, Inc.
- Lashinsky, A. (2007, January 29). Google's Employment Roster. *Fortune*.
- Latham, G., & Saari, L. (1984). Do People Do What They Say? More Studies of the Situational Interview. *Journal of Applied Psychology*, 569-573.

<sup>33</sup><http://humanresources.about.com/cs/communication/ht/receivefeedback.htm>

<sup>34</sup>[http://humanresources.about.com/od/performanceevals/a/perf\\_appraisal.htm](http://humanresources.about.com/od/performanceevals/a/perf_appraisal.htm)

<sup>35</sup>[http://humanresources.about.com/od/performanceevals/a/perf\\_appraisal.htm](http://humanresources.about.com/od/performanceevals/a/perf_appraisal.htm)

<sup>36</sup><http://humanresources.about.com>

<sup>37</sup><http://humanresources.about.com>

<sup>38</sup>[http://instruct1.cit.cornell.edu/courses/dea453\\_653/ideabook1/thompson\\_jones/Taylorism.htm](http://instruct1.cit.cornell.edu/courses/dea453_653/ideabook1/thompson_jones/Taylorism.htm)

<sup>39</sup><http://en.wikipedia.org>

<sup>40</sup><http://www.careerjournal.com/columnists/inthelead/20070320-inthelead.html>

<sup>41</sup><http://www.irs.gov/businesses/small/article/0,,id=98858,00.html>

<sup>42</sup><http://home.att.net/~nickols/feedback.htm>

<sup>43</sup>[http://www.careersystemsintl.com/Word per cent20Files/The per cent20Development-Minded per cent20Manager.doc](http://www.careersystemsintl.com/Word%20per%20cent20Files/The%20per%20cent20Development-Minded%20per%20cent20Manager.doc)

<sup>44</sup>[http://www.sideroad.com/Career\\_Advice/receiving-feedback.html](http://www.sideroad.com/Career_Advice/receiving-feedback.html)

- Lectric Law Library. (n.d.). Retrieved May 21, 2007, from Lectric Law Library: <http://www.lectlaw.com/def2/w025.htm><sup>45</sup>
- Lockwood, N. (2005). *Workplace Diversity: Leveraging the Power of Difference for Competitive Advantage*. HR Magazine .
- Management by Objectives—SMART. (2007, May 1). Retrieved May 18, 2007, from Values Based Management: [http://www.valuebasedmanagement.net/methods\\_smart\\_management\\_by\\_objectives.html](http://www.valuebasedmanagement.net/methods_smart_management_by_objectives.html)<sup>46</sup>
- Marken, G. (2004). Collaboration: Managers Who Share Power, Have More Power. Retrieved 18 2007, May, from Enterprise Networks and Servers: <http://www.enterprisenetworksandservers.com/monthly/art.php?694><sup>47</sup>
- Marshall, T. (2002). Leadership Development for Small Organizations. T+D, 52-55.
- McDonald, G., & Obenchain, K. (2003). How does information technology affect communication, decision making, job design, and power within an organization? In D. Laube, & R. Zammuto, *Business Driven Information Technology: Answers to 100 Critical Questions for Every Manager*. Stanford: Stanford Business Books.
- McGann, R. (2004). Online Job Sites Overshadow Newspaper Classifieds. Retrieved May 14, 2007, from Clickz.com: <http://www.clickz.com><sup>48</sup>
- McGill, & Beatty. (1994). *Action Learning: A Practitioner's Guide*. London: Kogan.
- Meister, M. (n.d.). How to Give Feedback. Retrieved May 21, 2007, from FastCompany: <http://www.fastcompany.com/magazine/80/sgodin.html><sup>49</sup>
- Michaels, E., Handfield-Jones, H., & Axelrod, B. (2001). *The War for Talent*. Boston: Harvard Business School Press.
- Moyer, . R., McGuigan, J., & Kretlow, W. (2006). *Financial Management*. Thompson South-Western.
- Olson, D. (2003, April 22). Stakeholder. Retrieved May 17, 2007, from Six Sigma: <http://www.isixsigma.com/dictionary/Stakeholder-127.htm><sup>50</sup>
- O'Reilly, C., & Pfeffer, J. *Southwest Airlines: Using Human Resources for Competitive Advantage*. Stanford University Graduate School of Buiness.
- Parker, S., & Turner, N. (2002). Organizational Design and Organizational Development as Preconditions for Good Job Design and High Job Performance. In S. Sonnentag, *Psychological Management of Individual Performance*. Indianapolis: John Wiley & Sons, LTD.
- Peterson, R. (2005, April 21). Who Speaks For Employees? It's Certainly Not Management. Retrieved May 19, 2007, from The Seattle Times: [http://seattletimes.nwsourc.com/html/opinion/2002247724\\_peterson21.html](http://seattletimes.nwsourc.com/html/opinion/2002247724_peterson21.html)<sup>51</sup>
- Pfeffer, J. (2000). Six Dangerous Myths About Pay. *Harvard Business Review* .
- Pfeffer, J., & Viega, J. (1998). Putting People First for Organizational Success. Recruitment. (n.d.). Retrieved May 15, 2007, from Wikipedia: <http://en.wikipedia.org/wiki/Recruitment><sup>52</sup>
- Reilly, R., Smither, J., & Vasilopoulos, N. (1996). A Longitudinal Study of Upward Feedback. *Personnel Psychology* , 599-612.
- Rich, P. (n.d.). Giving and Receiving Feedback. Retrieved May 21, 2007, from <http://www.selfhelpmagazine.com/articles/growth/feedback.html><sup>53</sup>
- Ritberger, C. (2007). Tips on Managing the Differences Among Payroll Staff. *Payroll Manager's Report*, pp. 11-14.
- SAS. (n.d.). Careers. Retrieved May 2007, from SAS: <http://www.sas.com/jobs/corporate/index.html><sup>54</sup>

<sup>45</sup><http://www.lectlaw.com/def2/w025.htm>

<sup>46</sup>[http://www.valuebasedmanagement.net/methods\\_smart\\_management\\_by\\_objectives.html](http://www.valuebasedmanagement.net/methods_smart_management_by_objectives.html)

<sup>47</sup><http://www.enterprisenetworksandservers.com/monthly/art.php?694>

<sup>48</sup><http://www.clickz.com>

<sup>49</sup><http://www.fastcompany.com/magazine/80/sgodin.html>

<sup>50</sup><http://www.isixsigma.com/dictionary/Stakeholder-127.htm>

<sup>51</sup>[http://seattletimes.nwsourc.com/html/opinion/2002247724\\_peterson21.html](http://seattletimes.nwsourc.com/html/opinion/2002247724_peterson21.html)

<sup>52</sup><http://en.wikipedia.org/wiki/Recruitment>

<sup>53</sup><http://www.selfhelpmagazine.com/articles/growth/feedback.html>

<sup>54</sup><http://www.sas.com/jobs/corporate/index.html>

- Schaefer, P. (n.d.). How to Avoid Hiring Failures: Assess Interpersonal Skills and Motivation Levels. Retrieved May 15, 2007, from <http://www.businessknowhow.com/manage/hiring-failure.htm><sup>55</sup>
- Schermerhorn, J. (2006). Job Design Alternatives. In S. Elbe, Personal Management 8th Edition. Hoboken: John Wiley and Sons, Inc.
- Schermerhorn, J. (1993). Taylorism? Retrieved May 19, 2007, from Management for Productivity: [http://instruct1.cit.cornell.edu/courses/dea453\\_653/ideabook1/thompson\\_jones/Taylorism.htm](http://instruct1.cit.cornell.edu/courses/dea453_653/ideabook1/thompson_jones/Taylorism.htm)<sup>56</sup>
- Schneider, C. (2006, February). The New Human-Capital Metrics. CFO, pp. 22-27.
- Schweyer, A. (2006). An Internal War for Talent. Retrieved May 3, 2007, from Inc: <http://www.inc.com/resources/recruiting/articles/20050401/talentwars.html><sup>57</sup>
- Shim, J., Siegel, J., & Simon, A. (2004). The Vest Pocket MBA. London: Penguin Books.
- SHPS. (n.d.). Program Information. Retrieved May 2007, from FSAFEDS: <https://www.fsafeds.com/fsafeds/literature.asp><sup>58</sup>
- Smith, G. (n.d.). How to Interview and Hire Top People Each and Every Time. Retrieved May 15, 2007, from Business Knowhow.com: <http://www.businessknowhow.com/manage/hiretop.htm><sup>59</sup>
- Smith, S., & Mazin, R. (2004). The HR Answer Book. New York: Division of American Management.
- Solnik, C. (2006, April 14). Employee Input is Key to Improving Workplace. Retrieved May 17, 2007, from Long Island Business News: [http://findarticles.com/p/articles/mi\\_qn4189/is\\_20060414/ai\\_n16167375](http://findarticles.com/p/articles/mi_qn4189/is_20060414/ai_n16167375)<sup>60</sup>
- Spreitzer, G. (1995). Psychological Empowerment in the Workplace: Dimensions, Measurement, and Validation. *Academy of Management Journal*, 38, 1442-1465.
- Srohm, O. (2002). Organizational Design and Organizational Development as Preconditions for Good Job Design and High Job Performance. In S. Sonnentag, Psychological Management of Individual Performance. Indianapolis: John Wiley & Sons, LTD.
- Survey Monkey. (2007). Survey Monkey. Retrieved May 21, 2007, from <http://www.surveymonkey.com><sup>61</sup>
- Taylorism. (n.d.). Retrieved May 2007, from Cornell University: [http://instruct1.cit.cornell.edu/courses/dea453\\_653/ideabook1/thompson\\_jones/Taylorism.htm](http://instruct1.cit.cornell.edu/courses/dea453_653/ideabook1/thompson_jones/Taylorism.htm)<sup>62</sup>
- The U.S. Equal Employment Opportunity Commission. (n.d.). The ADA: Your Responsibilities as an Employer. Retrieved May 19, 2007, from EEOC: <http://www.eeoc.gov/facts/ada17.html><sup>63</sup>
- Thomas, D., & Ely, R. (1996). Making Differences Matter; A New Paradigm for Managing Diversity. *Harvard Business Review*, 1-13.
- Thomas, R. J. (20014). *Harvard Business Review on Managing Diversity*. Boston: Harvard Business School Publishing Corporation.
- Tips for Creating an Effective Online Job Posting. (n.d.). Retrieved April 17, 2007, from <http://yourhrexperth.com><sup>64</sup>
- Training and Development. (2007). Retrieved May 19, 2007, from Wikipedia: [http://en.wikipedia.org/wiki/Training\\_per\\_cent26\\_Development](http://en.wikipedia.org/wiki/Training_per_cent26_Development)<sup>65</sup>
- U.S. Department of Justice. (n.d.). ADA Home Page. Retrieved October 18, 2006, from <http://www.usdoj.gov/crt/ada/adahom1.htm><sup>66</sup>
- U.S. Department of Labor. (n.d.). The Americans With Disabilities Act of 1990. Retrieved October 15, 2006, from The American's With Disabilities Act of 1990

<sup>55</sup><http://www.businessknowhow.com/manage/hiring-failure.htm>

<sup>56</sup>[http://instruct1.cit.cornell.edu/courses/dea453\\_653/ideabook1/thompson\\_jones/Taylorism.htm](http://instruct1.cit.cornell.edu/courses/dea453_653/ideabook1/thompson_jones/Taylorism.htm)

<sup>57</sup><http://www.inc.com/resources/recruiting/articles/20050401/talentwars.html>

<sup>58</sup><https://www.fsafeds.com/fsafeds/literature.asp>

<sup>59</sup><http://www.businessknowhow.com/manage/hiretop.htm>

<sup>60</sup>[http://findarticles.com/p/articles/mi\\_qn4189/is\\_20060414/ai\\_n16167375](http://findarticles.com/p/articles/mi_qn4189/is_20060414/ai_n16167375)

<sup>61</sup><http://www.surveymonkey.com>

<sup>62</sup>[http://instruct1.cit.cornell.edu/courses/dea453\\_653/ideabook1/thompson\\_jones/Taylorism.htm](http://instruct1.cit.cornell.edu/courses/dea453_653/ideabook1/thompson_jones/Taylorism.htm)

<sup>63</sup><http://www.eeoc.gov/facts/ada17.html>

<sup>64</sup><http://yourhrexperth.com>

<sup>65</sup>[http://en.wikipedia.org/wiki/Training\\_per\\_cent26\\_Development](http://en.wikipedia.org/wiki/Training_per_cent26_Development)

<sup>66</sup><http://www.usdoj.gov/crt/ada/adahom1.htm>

United States Department of the Interior. (2004). Performance Appraisal Handbook. Retrieved from <http://www.doi.gov/hrm/guidance/370dm430hndbk.pdf><sup>67</sup>

Wilson, T. (2000, Fall). What's Hot and What's Not: Key Trends in Total Compensation. Wilson Group Newsletter.

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<sup>67</sup><http://www.doi.gov/hrm/guidance/370dm430hndbk.pdf>

## Solutions to Exercises in Chapter 3

### **Solution to Exercise 3.1.1 (p. 158)**

Result: The exercise demonstrates how easily misunderstandings develop, even among speakers of the same language, when not enough detail is provided, when clarification questions are not encouraged, and when non-verbal signs of hesitation or frustration are overlooked.



## Chapter 4

# Leadership

### 4.1 Eight Leader Behaviors That Increase Motivation, Morale, and Performance...And One That Won't<sup>1</sup>



NOTE: This module has been peer-reviewed, accepted, and sanctioned by the National Council of Professors of Educational Administration (NCPEA) as a scholarly contribution to the knowledge base in educational administration.

I was recently visiting with a principal who had asked for my advice. The third-year principal was experiencing staff morale problems and, to make matters worse, had been called to a conference with the superintendent to discuss remedying the problems. In fact, it was a “fix it or else” kind of conference. I felt for the principal. Like most leaders, I had experienced the “morale is the worst it has ever been” syndrome on more than one occasion as a principal. My empathy for this still-neophyte school leader was palpable.

Few staff issues concern leaders more than motivation and morale. They can seem to be present at one moment and then gone the next. Anyone who conducts a culture audit in the late spring understands that the results would have been totally different had the survey been conducted in the fall of the year. Motivation and morale, two formless, shapeless, seemingly simple yet illusively complex internal conditioned emotions, are held in high regard by leader, follower, and employer. But are they really understood? What produces high levels of morale? Can one person reasonably be responsible for the morale of another? What role does professionalism play?

This manuscript will explore the relationship between morale and motivation along with performance and professionalism. It will also explore ways that school leaders can work more effectively in this area of leader expectations.

The history of the culture of teaching, which largely continues unchanged today, is one of professional practice in isolation. Teachers routinely continue to plan in isolation, assess in isolation, and solve problems of practice in isolation. In this model of organized independence, the role of the principal is to assure unfettered isolation from outside forces that might challenge this protected independence (Elmore, 2000). It is an almost unchallenged assumption of the profession that academic freedom to act independently is a primary booster of motivation and morale, and, therefore, of teacher and student performance. As this

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<sup>1</sup>This content is available online at <<http://cnx.org/content/m15614/1.1/>>.

culture of loosely coupled expectations developed over the years, it did so because it worked at a time when schools, teachers, and principals functioned in a very different environment with a different set of expectations. In an environment where the standard was attendance for all – learning for some, loosely coupled schools could be successful.

Was morale and motivation higher during that time? Consider this from Larry Lezzotte (2006).

Beginning in the late 1980s, on through the '90s and NCLB, teachers and principals have seen the standards and accountability movement as reducing teacher autonomy and professional freedom. To them, this "movement" means they are now told what to do, how to do it, and what the results must be. Furthermore, they see no sign that this trend will reverse or even level off in the near future. This being so, one would predict that teacher professional satisfaction has declined as a result of this movement. Has it?

Surprisingly not, according to the 2006 American Teacher Survey. Teacher satisfaction is at an all time high, with 56% of the teachers surveyed reporting being very satisfied with their careers. In 1986, before the standards and accountability movement was fully underway, as few as 33% of teachers reported being very satisfied. (p. 1)

What might explain this paradox? Looking first at definitions of motivation and morale, Princeton University's WordNet, an online lexical database for the English language, defines motivation as "[T]he psychological feature that arouses an organism to action toward a desired goal; the reason for the action; that which gives purpose and direction to behavior" (WordNet, 2007), and defines morale as "[A] state of individual psychological well-being based upon a sense of confidence and usefulness and purpose" (WordNet, 2007). Clearly, morale and motivation are intrinsically linked. One cannot discuss morale without motivation. Place one in front of the other as in morale produces motivation or reverse the two as in motivation produces morale, and both make perfectly good sense. For the discussion here, they are used not interchangeably but as one intrinsically connected to the other. Regardless of how they are used, the key idea is this: motivation and morale are internal cognitive operations capable of being influenced by the external environment. Performance, then, is a reflection of how motivation and morale are influenced by the external environment.

In revisiting and rethinking issues of motivation, morale, and performance, it is appropriate to consider anew the work of Fredrick Herzberg. Herzberg did his initial research into motivation and performance in the 1960s. In a 1975 article in *Harvard Business Review*, reprinted in 2003, Frederick Herzberg again addressed the question, "One More Time: How Do You Motivate Employees?" This continues to be one of *Harvard Business Review's* most requested reprints. Indeed, Herzberg's motivation-hygiene theory continues to be a guiding light to all types of organizations.

Herzberg identified six factors he designated as intrinsic motivators or growth factors. They are (in order of most to least motivating) achievement, recognition, work itself, responsibility, advancement, and growth. These factors, if present, lead to increased levels of job satisfaction and motivation (Herzberg, 2003).

He identified ten factors that he designated as hygiene factors. They are (in order of most to least effect in causing job dissatisfaction) company policy and administration, supervision, relationship with the supervisor, work conditions, salary, relationship with peers, personal life, relationship with subordinates, status, and security. These factors, when not present, lead to job dissatisfaction (Herzberg, 2003).

Herzberg (2003) offers an important caveat regarding his research. "The findings of these studies, along with corroboration from many other investigations using different procedures, suggest that the factors involved in producing job satisfaction (and motivation) are separate and distinct from the factors that lead to job dissatisfaction." In other words, "[t]he opposite of job dissatisfaction is not job satisfaction, but no job dissatisfaction" (p. 6-7).

So how does this translate for the education profession? Educational leaders must once and for all recognize that no matter how much time is spent on policy development, budget management, supervision, principal-teacher collegiality, work conditions, salary, teacher-teacher collegiality, or security, these factors will not produce motivation. People are never managed into increased performance. The best that can be expected is that there will be no job dissatisfaction.

Herzberg (2003) explained this seeming conundrum in terms of basic hygiene. The presence of good hygiene will not make one healthier, but absence can cause health deterioration. The expectation that principals must be good managers is not ill-conceived; however, those expectations only provide a starting

point. With solid management as the starting point, principals must lead the organization so as to provide the framework for increased motivation. In other words, motivated employees require motivated leaders and visionary leadership. However, there is another conundrum – leaders do not cause motivation. Rather, they set the conditions and lead in ways through which followers find their own motivation and morale. What then are ways in which leaders can lead in order to facilitate higher levels of motivation and morale?

First, before leaders can lead others to higher levels of motivation and morale, they identify their own knowledge and beliefs about the role of leadership in organizations. This is the first key leader behavior. Toward this end, leaders should develop a personal leadership platform from which they work. Peter Senge (1990) identifies this as the discipline of personal mastery. Before one can lead others toward a shared vision, a leader must clarify the things that really matter to him. The educational platform provides a foundation for examining one's beliefs, values, and practices about the roles of leader, teacher, and student in the educational process (Sergiovanni, 1983). In other words, leaders must have a profound understanding of their highest aspirations of service to the profession. "What leaders encourage others to do must be congruent with the values they espouse and demonstrate through action" (Norris, 1996). The leadership platform tool typically contains at least three major components to help school leaders achieve personal mastery, but can be expanded to accommodate individual levels of understanding of educational leadership.

#### 1. A personal belief system

Who are you?

What do you believe about the nature of learning and its relationship to school leadership?

What do you believe about the nature of students?

What do you believe about the role of parents?

What do you believe should be the role of teachers and pedagogy?

#### 2. Current level of understanding of leadership and organizations based on experience and study

What is your web of connections? Who are the people who have influenced you most profoundly? Why and how do you know what you know?

What is your plan for developing profound knowledge?

#### 3. Vision for leadership

How will you lead?

What will be different about your leadership?

What legacy will you leave?

The second key leader behavior is that the principal must be the principal-learner and the principal-teacher of all things leadership. Former General Electric CEO, Jack Welch, established the teaching of leadership to others as an expectation for General Electric managers (Tichy, 1998). Becoming an effective school teacher-leader is not achieved simply by sharing in decision-making. In fact, shared decision-making, where the decisions focus on work conditions rather than organizational growth and improvement, will not increase motivation at all. And should the decision-making process have an element of disingenuousness ("The central office said we had to do this, so we are"), then one can expect job dissatisfaction to increase. If teachers are to participate in meaningful organizational improvement, leadership skill development is critical, and the school principal is the appropriate teacher of leadership skills.

The third key leader behavior to improve staff motivation depends on the success of the second. Leaders must affirm and teach the powerful roles that organizational beliefs, vision, and mission play in creating a job culture capable of high levels of motivation. A culture of high motivation and morale follows three important collective agreements: what the organization values (beliefs); what the organization aspires to (vision); and how the organization will go about reaching its aspirations (mission). Unfortunately many principals and teachers see reaching for these important corporate agreements as add-on activities which take away from the time and ability of principals and teachers to do the job at hand. Herzberg would argue that they are the job at hand. "The stimuli for the growth needs [and motivation] are tasks that induce growth . . . [T]hey are the job content" (Herzberg, 2003). According to Harvard's Richard Elmore (2000), agreement on what's worth achieving is the precondition for any organizational improvement.

Almost every school is engaged in some kind of improvement process. However, far too many principals are merely caretakers of the status quo rather than leaders of improvement. The process of leading meaningful improvement can be expressed in the formula shown in Figure 1. [Click Here to access Figure 1<sup>2</sup> Formula for Meaningful Organizational Improvement](http://cnx.org/content/m15614/latest/Figure1.pdf). Developed by the author to explain the complexity of organizational change and improvement and to illustrate how the components interact with each other.

Where meaningful and powerful organizational improvement is the norm, people are able to develop their own platforms and achieve their own personal visions within the larger organizational vision.

The fourth important key behavior is that the principal must lead through the reciprocity of accountability. Richard Elmore (2000) describes this philosophy as: “If the formal authority of my role requires that I hold you accountable for some action or outcome, then I have an equal and complementary responsibility to assure that you have the capacity to do what I am asking you to do” (p. 12). If schools are to practice shared leadership or, as Elmore (2000) describes, distributed leadership, the traditional structure of supervision (hygiene factor) must be replaced with a new structure of accountability – one which is built upon individual and collective growth (motivation factor) and thereby inherently satisfaction boosting.

In any organized system, people typically specialize, or develop particular competencies, that are related to their predispositions, interests, aptitudes, prior knowledge, skills, and specialized roles. Furthermore, in any organized system, competency varies considerably among people in similar roles; some principals and teachers, for example, are simply better at doing some things than others, either as a function of their personal preferences, their experience, or their knowledge. Organizing these diverse competencies into a coherent whole requires understanding how individuals vary, how the particular knowledge and skill of one person can be made to complement that of another, and how the competencies of some can be shared with others. In addition, organizing diverse competencies requires understanding when the knowledge and skill possessed by the people within the organization is not equal to the problem they are trying to solve, searching outside the organization for new knowledge and skill, and bringing it into the organization. (p. 14-15)

Fifth, the principal must focus efforts to increase motivation and morale by building collegiality around problems of practice – or as described by Elmore (2000), job content. Collegiality is certainly not a bad thing. However, according to Herzberg (2003), these two relationship factors (teacher-teacher and principal-teacher) simply are not motivators, but are maintainers of hygiene. What then, is one to make of collegiality as a tool of motivation and morale? Researcher Susan Rosenholtz (1986) writes of principal-teacher collegiality.

[C]ollegiality with teachers had no direct effect on school performance, but it did have an indirect effect when mediated by school-level goal setting, as well as teacher recruitment, socialization, and evaluation. In other words, principal collegiality with teachers affects school performance only when it is connected to activities that focus on the school’s purposes and that translate those purposes into tangible activities related to teaching. (p. 100)

Rosenholtz’s research is supported by that of Robert Marzano who identified staff collegiality as one of the five school-wide factors that most affects student achievement and is under control of the school. Like Rosenholtz, Marzano (2003) points out that staff collegiality is a factor for increasing student achievement only when that collegiality occurs around problems of practice.

Sixth, principals should emulate the actions of successful coaches. Successful coaches come in all shapes, sizes, temperaments, and sexes, but they possess three common factors of success. (1) They possess an overwhelming desire – a burning passion – to coach and they communicate this passion to the athletes they coach. (2) They understand the power of accomplishing short-term goals on the journey to accomplishing a bigger vision. One cannot win a championship without constantly monitoring and adjusting one week at a time. Each game is a problem, a challenge, and an opportunity. The opposition has talents and weaknesses unique to them. Good coaches (those who, some years, have great seasons) execute their game-plan regardless of the competition. The great coaches constantly adjust game-plans in order to get their personnel in the place of optimum potential. (3) Outstanding coaches understand how their athletes are motivated. They understand that power of a pregame pep-talk lasts about as long as it takes to run out of the dressing room. Great coaches eschew the rah-rah mentality like the plague. Instead they focus on communicating high levels of expectations in an environment equally high in individual care and concern for the athletes.

<sup>2</sup><http://cnx.org/content/m15614/latest/Figure1.pdf>

High expectations expressed through a loud, overbearing, kick in the pants attitude adjustment style simply doesn't work. Herzberg says of the KITA (Kick in the Ass) methods,

Why is KITA not motivation? If I kick my dog (from the front or the back), he will move. And when I want him to move again, what must I do? I must kick him again. Similarly, I can charge a person's battery, and then recharge it, and recharge it again. But it is only when one has a generator of one's own that we can talk about motivation. One then needs no outside stimulation. One wants to do it. (p. 4)

One builds Herzberg's generator through high levels of care and concern. Otherwise high expectations are a function of supervision not motivation. But does this work with adults? Sure it does. This is what Herzberg has been saying since 1966.

The seventh leadership skill, which can secure an environment where all staff members develop high levels of morale and motivation, is to recognize that leadership produces significant levels of discomfort among followers. Affirming, not tolerating or diminishing, the discomfort that always accompanies growth is a leadership skill which must be shared, taught, and re-taught. The avoidance of discomforting situations whether dieting, starting a new exercise regime, or learning new pedagogical skills fails too often, not so much from a lack of desire to change, but the unwillingness to experience the growth pains of change. Effective leadership, whether of the individual or shared variety, also comes with a cost. Ronald Heifetz, director of the Leadership Education Project at Harvard University's John F. Kennedy School of Government, says, "Many people have a 'smiley face' view of what it means to lead. They get a rude awakening when they find themselves with a leadership opportunity. Exercising leadership generates resistance – and pain" (Taylor, 1999). Very often that resistance comes from the pursuit of goals currently beyond the organization's ability always to reach them, and this always carries risks of failure. Often schools simply avoid this discomfort of resistance by abandoning the goal using lack of buy-in at the beginning as a convenient excuse not to move forward. In other words, too many people assume that before an organization undertakes significant change, it must have very high levels of staff buy-in. Michael Fullan rejects this idea. He says, "Shared beliefs are a result of action not a precondition for action and because ownership is such a difficulty, forceful leadership at the beginning is critical" (Fullan, 2004). A consequence of forceful leadership is assumed to be, at the least, discomfort among staff members; so is Fullan's idea sound? Anyone who has been a part of a high performing team understands Heifetz and Fullan. The familiarity and even intimacy shared by high performing teams come as a result of hard work toward a meaningful endeavor, not as a precondition for it.

The eighth and final leadership behavior which promotes high levels of motivation and morale is the development of a sense of cultural professionalism throughout the organization in pursuit of common goals. Professionalism is not dependent on the day-to-day fluctuations in motivation and morale, but rather succeeds in spite of them. Consider this scenario. A patient recently discovered that he has the need for immediate heart bypass surgery and visits the most highly rated thoracic surgeon within a hundred miles. The patient is impressed with the surgeon during the preadmission visit and schedules the surgery for the following week. Does the patient check on the surgeon's history of morale issues or conflicts with the hospital administration, the anesthesiologist, or nurses? As he is wheeled into the operating room, will the patient be concerned with the surgeon's morale that day? Not likely. He will put his faith in the surgeon's and nurses' knowledge, skills, experience, and sense of professionalism. The patient assumes that all the motivation needed by the medical staff is the desire to get him healthy again.

Should teaching be any different? Not according to Dr. Larry Rowedder, Superintendent in Residence at the Stupski Foundation. In an interview with Dr. Rowedder on the subject of morale and motivation he said, "Morale is way overrated. The internal emotion that we should pay attention to is professionalism. I don't think we should ignore the effects of morale on performance. We should just adjust our focus more in the direction of professionalism" (L. Rowedder, personal communication, January 20, 2007).

This examination of motivation and morale began with a brief history of the independent nature of the teaching profession and the relationship of independence to notions of increased morale and motivation. Although not specifically revisiting the effects of each of the eight principal behaviors discussed here on the variable of isolation, the behaviors discussed here begin with the leader, but directly affect other staff members in ways consistent with Herzberg's original research. These eight behaviors are certainly not a comprehensive list, and it is the author's hope that others will expand upon the lessons noted here, as

motivation and morale are likely to always be a bright image on the professional radar of principals and teachers. Only as one understands the complexities of motivation, morale, and performance can a leader begin to establish the circumstances through which all professional members of the school community can develop high levels of individual and corporate motivation and morale in pursuit of the vision of learning for all children.

#### References

Elmore, R. F. (2000, Winter). Building a structure for school leadership. Albert Shanker Institute Albert Shanker Institute: Washington, D.C., Winter 2000 (7). Retrieved March 24, 2006, from <http://www.ashankerinst.org/Downloads/building.pdf>.

Fullan, M. (2004, December 6). Leadership and sustainability: Developing systems [U+2011]thinkers [U+2011]in [U+2011]action. Opening Session: National Staff Development Council, Vancouver, CA.

Lezzotte, L. W. (2006, September). Dear colleague letter. *Effective Schools Research Abstracts*, 2006-2007 (3), 1.

Marzano, R. J. (2003). *What works in schools: Translating research into action*. Alexandria, VA: Association for Supervision & Curriculum Development.

Motivation. WordNet:A lexical database for the English language. Princeton University. Retrieved February 9, 2007, from <http://wordnet.princeton.edu/perl/webwn>.

Norris, C, Basom, M, Yerkes, D, and Barnett, B, (October 1996) Leadership platforms: Perspectives and prospects. Paper presented to University Council of Educational Administration Annual Meeting in Louisville, KY.

Rosenholtz, S. J. (1986). Organizational conditions of teacher learning. *Teaching and Teacher Education*, 2 (2), 91-104.

Senge, P. (1998, Summer). The practice of innovation. *Leader to Leader*, 9 (Summer 1998), 16 [U+2011]22. Retrieved February 1, 2007 from <http://www.leadertoleader.org/knowledgecenter/L2L/summer98/senge.html>.

Seriovanni, T and Starratt, R (1983) *Supervision: Human perspectives*. New York: McGraw Hill.

Taylor, W. C. (2004, September). The leader of the future [U+2011] Ronald Heifetz offers a short course on the future of leadership [U+2011] interview with Ronald Heifetz. *Fast Company*, 86, 130.

Tichy, N. (1998). *Leadership engine: Building leaders at every level*.

## 4.2 Emotional Intelligence: An Overlooked Aspect of Effective Leadership Practices: A Review of the Literature on Desirable Traits, Behaviors and Characteristics for Successful Leadership Promoting Transformational Change<sup>3</sup>



NOTE: This module has been peer-reviewed, accepted, and sanctioned by the National Council of the Professors of Educational Administration (NCPEA) as a scholarly contribution to the knowledge base in educational administration.

Great leaders move us. They ignite our passion and inspire the best in us. When we try to explain why they are so effective, we speak of strategy, vision or powerful ideas, but the reality is much more primal. Great leadership works through the emotions.

(Goleman, Boyatzis, & McKee, 2002, p. 1)

School leaders are faced with an abundance of issues when they assume a leadership position, second only to high expectations for systemic and transformational change in the school system. Recently, reports have been published questioning the rigor of educational leadership programs offered at universities. Arthur Levine's second report in a series of four criticizes programs which prepare principals and superintendents. (See Education Week, March 16, 2005.) In addition, Darling-Hammond, LaPointe, Meyerson, Orr, and Cohen (2007) presented in their report, *Preparing School Leaders for a Changing World*, key components necessary for exemplary principal preparation programs. The recommendations proposed in these reports are valid, but equally important is the balance of training in the area of "emotional intelligence" (EI) for an educational leader's success in becoming a change agent for the improvement of instruction. As defined by Daniel Goleman, EI is the ability to lead, recognizing four emotional areas: self-awareness, self-management, social awareness, and relationship management, each having specific characteristics. These four cluster areas focus on identified traits, behaviors and characteristics of successful leaders. Research has identified additional areas including organizational and management skills, shared values and beliefs, collegiality, and staff building. In each of these areas emotional intelligence is a common theme.

### Organization and Management Skills

Organization and management skills have been a focus of research regarding traits, behaviors and characteristics of successful leaders (Covey, 1989; Yukl, 1994). According to Hargreaves and Fullan (1998), principals are "gatekeepers and gate-openers of their schools" (p. 105). It is their opinion the principal of the last decade (1987-1997) "was urged to develop collaborative cultures within schools" and "the principal of the next decade (1998-2008) should be leading the way to redefine collaboration so that it encompasses alliances with groups and individuals outside of the schools" (p. 116). Guidelines for principals have been suggested and include "effective habits" and "desirable qualities." These characteristics, traits and behaviors focus on common sense, management, and organization within a system (Covey, 1989; Hargreaves & Fullan, 1998; Maxwell, 1999). Hargreaves and Fullan provided basic guidelines, specifically "steering clear of false certainty; basing risk on security; respecting those you want to silence; moving towards the danger in forming new alliances; managing emotionally as well as rationally; and fighting for lost causes" (p. 105).

In conjunction with the organizational and management component of an effective leader, the components of emotional reactions, emotional well being, passion, and managing emotionally also have a place in the leader's success (Covey, 1989; Maxwell, 1999; Tichy, 1997; Yukl, 1994). The authors contend that successful

<sup>3</sup>This content is available online at <<http://cnx.org/content/m15615/1.2/>>.

leaders need to be cognizant not only of their own emotional well being but also of others'. Leaders need to manage emotionally and rationally. Asking employees how they feel, showing how the leader feels, asking for help, demonstrating empathy, and talking to people are examples of this emotional connectedness (Covey, 1989; Maxwell, 1999; Tichy, 1997; Yukl, 1994). "Managing emotionally means putting high priority on reculturing your school and its relationship to what's out there, and not merely restructuring it" (Hargreaves & Fullan, 1998, p. 118). Successful leaders recognize the importance of emotional reactions from the followers (Tichy, 1997; Yukl, 1994). These emotional reactions are defined as the charismatic leadership theory. Yukl (1994) writes, "Charismatic theories acknowledge the importance of symbolic behavior and the role of the leader in making events meaningful for followers" (p. 339).

Another view of leadership includes a sharing of a set of fundamentals. These fundamentals incorporate taking responsibility for the mentoring of other leaders, developing teachable points of view in emotional energy and edge, sharing living stories, and serving as effective role models. According to Tichy (1997) leaders "deliberately generate positive emotional energy in others. And they demonstrate and encourage others to demonstrate edge, which is the ability to face reality and make tough decisions" (p. 3). The role of the principal has become complex. Fullan (2000) states, "Leaders moving their staff toward external dangers in a world of diversity cannot invite disagreement without attending to their own emotional health" (p. 160). This statement reinforces the need for the principals' ability to recognize the emotional aspect of their role. Principals who manage emotionally "have a strong task focus, expect anxiety to be endemic in school reform, but invest in structure and norms that help contain anxiety" (p. 161).

Maxwell (1999) discusses four truths about passion and its relationship to effective leaders. He contends passion is the first step toward achievement; passion increases your willpower; passion changes you; passion allows you to become a more dedicated and productive person. "A leader with great passion and few skills always out performs a leader with great skills and no passion" (p. 85). Belief in passion can be summarized with the following thought by Maxwell (1999):

If passion is not a quality in your life, you're in trouble as a leader. The truth is that you can never lead something you don't care passionately about. You can't start a fire in your organization unless one is first burning in you. (p. 86)

It is noted that empathic listening and development of the emotional connection is risky. Covey (1989) states, "You become vulnerable. It's a paradox, in a sense, because in order to have influence, you have to be influenced. That means you have to really understand" (p. 243). Empathic listening takes time and "whatever investment of time it takes to do that will bring much greater returns of time as you work from an accurate understanding of the problems and issues from the high Emotional Bank Account that results when a person feels deeply understood" (p. 253).

#### Shared Values and Beliefs

Principals' interactions with teachers are critical in developing the connectedness for successful leadership. There is the necessity for leaders to have teachers connect with shared community values, ideas, and ideals. In addition to these shared values, there needs to be a commitment to communicate those values with the teachers. Although challenging, an effective leader can accomplish these tasks despite the complexity of the identified areas of importance (Deal & Peterson, 1994; Sergiovanni, 1996; Sergiovanni & Starratt, 1998).

Deal and Peterson (1994) state, "Values are communicated in everything a school leader does, writes, and speaks. Consistency in behavior and connection to convictions about student learning and growth serve to mold core values as well as to encourage progress" (p. 86). Furthermore, Deal and Peterson point out that effective leaders view their role from both the technical and symbolic point of view. "Technical problems require the analytical, rational problem-solving capabilities of a well-organized manager. Symbolic dilemmas require the sensitive, expressive touch of an artistic and passionate leader. Tomorrow's principal in our view will be asked to be a combination of both - or to spot and empower others who can provide the managerial efficiency or the leadership energy and vision the principal cannot" (p. 113). Teachers need to be motivated by emotions and beliefs as well as self-interest and collegiality. Past research has placed far more emphasis on what leaders do and not enough on the aspect of communication. This overlooked aspect of leadership is recognized by the overemphasis on leadership objectives, outcomes, and measurable leadership effectiveness (Deal & Peterson, 1994; Sergiovanni, 1982).



Sergiovanni (1996) states, "In order for a principal to build this professional community, the leader needs to create teacher group strategies that give high priority to conversation and dialogue among teachers" (p. 142). Communication has an emotional connection described best by Sergiovanni (1992) as the theory of the head, heart and hand of leadership. According to Sergiovanni, the hand of leadership is the "decisions, actions, and behaviors of the leader" (p. 8). "The heart of leadership is what a person believes, values, dreams about, and is committed to - the person's personal vision...it is the person's interior world, which becomes the foundation of her or his reality" (p. 7).

Research indicates desirable leadership qualities are consistently not related to any one style, personality, gender, or ethnicity. A principal's skill in the area of human relations, decision-making, control of subordinates and conflict resolution are indicators of leadership traits and behaviors. Effective leaders will support and encourage staff to model behaviors promoting collegiality and a professional working environment. This leadership is based on wisdom and is grounded in principles that bring out the best in people (Boleman & Deal, 2002; Bulach, Michael, & Boothe, 1999; Sokolow, 2002). Focus, passion, wisdom, courage, and integrity are additional qualities. Great leaders have an internal compass and are leaders with a vision. Passionate leaders care deeply about their work and making a difference. Wise leaders learn from their experiences, not only the successes but also the failures. It is the courage of a leader that allows a person to forge ahead not always having the correct information or a clear path. It is the quality of integrity that inspires trust and loyalty (Boleman & Deal, 2002).

Sokolow (2002) identified eight principles of enlightened leadership: intention, attention, unique gifts, gratitude, life lessons, holistic perspective, openness and trust. "Becoming more conscious of these principles and moving them to the forefront of our awareness will help us exercise sound judgment as we, as leaders, meet the challenges we face as we strive to shape a better and brighter future for our youth" (Sokolow, 2002).

In addition, purposing, maintaining harmony, institutionalizing values, motivating, managing, explaining, enabling, modeling, and supervising are nine tasks identified as key components for the development of an effective leader. Another quality is self-understanding. Effective principals must not only know themselves, but are also true to themselves (Hausman, Crow, & Sperry, 2000; Sergiovaanni, 1996). Hausman, Crow, and Sperry (2000) contend, "Their actions are congruent with their values." The authors continue stressing the need for the leader to understand their needs and emotions as well as their strengths and limitations. "The ideal principals must focus intensely on their interpersonal skills, capacity to read and adjust to the environment, and the ability to understand and cope with far ranging issues. They must be politically astute, prepared to adjust their leadership styles, and ethically grounded" (Hausman, Crow & Sperry, 2000).

#### Collegiality and Staff Building

Learning experiences for principals cannot just reinforce old "platitudes" of being effective, but must encourage principals to question their practices and attempt change. At times leadership is viewed as a mysterious and elusive concept. The challenge is for individuals to look inward to achieve effective leadership (Chopra, 2002; Evans & Mohr, 1999). Effective leaders possess an approach defined as "soft management." Soft management principles consist of explaining the real reason behind your tough decisions - in person; taking the heat for your own viewpoint; letting people confront the source of their difficulties; and opening yourself up to employees' emotions. It is the belief that communicating a weakness builds solidarity between followers and leaders (Goffee & Jones, 2000; Peace, 2001).

Marzano (2003) highlights three principles for effective leaders. The first revolves around the principal functioning as a strong cohesive force; the second is to provide strong guidance while demonstrating respect; and the third principle is characterized by specific behaviors which enhance interpersonal relationships. Principle three further establishes three characteristics of importance: optimism, honesty, and consideration. Optimism increases teachers' self-esteem and motivation. "Honesty is characterized by truthfulness and consistency between words and actions" (p. 177). Consideration "is sometimes referred to as a people orientation or a concern for people" (p. 178). Honesty and consideration both help build interpersonal relationships. These three characteristics require development and must be acted upon for effective leadership.

Goffee and Jones (2000) theorize that leaders need vision and energy. "But to be inspirational, leaders need four other qualities. Probably not what you expect, these qualities can be honed by almost anyone willing to dig deeply into their true selves" (p. 19). Their research observed four unexpected qualities shared

by inspirational leaders: leaders selectively show their weakness; they rely heavily on intuition to gauge the appropriate timing and course of their actions; they manage employees with something they called tough empathy; and they reveal their differences (Goffee & Jones, 2000). Their research indicates all four qualities were needed for a leader to be truly inspirational. Inspirational leaders mix and match these qualities to define their individual style. An approach defined as “tough empathy” is what Goffee and Jones (2000) view real leaders as possessing. “Tough empathy means giving people what they need, not what they want” (p. 24). Tough empathy balances respect for the individual and for the task. Tough empathy also provides the benefit of “impelling leaders to take risks” (p. 24). As noted by Goffee and Jones (2000) leaders who use tough empathy really care about something. When people care about something, they show their true self. Leaders communicate authenticity, which is the prediction for leadership, and they show what they are doing (Goffee & Jones, 2000). Finally, Goffee and Jones’ (2000) research also provides data of what can be categorized as four common myths about inspirational leaders. These myths included the following: (1) everyone cannot be a leader, (2) leaders cannot always deliver business results, (3) people who get to the top are not necessarily leaders, and (4) leaders are rarely great coaches. According to Goffee and Jones, these aforementioned traits are identifiable characteristics of successful leaders. The following terminology is used when describing characteristics of leaders: vision, enabling, encouraging, inspiring, empowering, awareness, honesty, integrity, taking risks and taking action. Research indicates any of these characteristics or combination drives an effective leader (Chopra, 2002; Kets de Vries, 2004; Kouzes & Posner, 2002).

Leadership qualities were researched by Kouzes and Posner (2002) through case study analysis and questionnaires. They identified five practices common to effective leadership. Their findings resulted in the following identifiers: modeling the way; inspiring a shared vision; challenging the process; enabling others to act; and encouraging the heart. In order for people to know their leaders, leaders in return must know their values and have a clear understanding of these values. Kouzes and Posner (2002) state:

Modeling the way is essentially about earning the right and respect to lead through direct individual involvement and action. People first follow the person, then the plan. ...Leaders inspire a shared vision. ... It is necessary for leaders to understand their people. ...people must believe that leaders understand their needs, and have their interest at heart (p. 15).

#### Emotional Intelligence

In an interview, Manfred F. R. Kets de Vries (2004) was asked how he identified effective leaders. His response focused on the emotional intelligence of a person. Kets de Vries clarified emotional intelligence as the self-reflection in a person. He refers to emotional intelligence as the “teddy bear factor.” Leaders should make people feel comfortable and develop a relationship in which they want to be close to the leader. “Emotionally intelligent leaders tend to make better team players, and they are more effective at motivating themselves and others” (Kets de Vries, 2004).

According to Cherniss (2000), (as cited in Salovey & Mayer, 1990), Salovey and Mayer used the term emotional intelligence “as a form of social intelligence that involves the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them, and to use this information to guide one’s thinking and action.”

Goleman and his colleagues examined the relationship between emotional intelligence and effective performance, especially in leaders. They observed to what degree emotional intelligence manifests itself in the work place. Goleman’s (1998) research was designed to determine which personal capabilities drove outstanding performance. He grouped the skills into three categories: technical skills, cognitive skills, and competencies demonstrating emotional intelligence. His data revealed dramatic results. Goleman states, “My analysis showed that emotional intelligence played an increasingly important role at the highest levels of the company” (p. 94). As the research continued, the four areas of emotional intelligence were defined: self-awareness, self-management, social awareness, and relationship management (Goleman, Boyatzis & McKee, 2002). Summarized by Goleman, Boyatzis, McKee, “These EI competencies are not innate talents, but learned abilities, each of which has a unique contribution to making leaders more resonant, and therefore more effective” (p. 38). Goleman, Boyatzis, and McKee (2002) contend that self-aware leaders understand values, goals and dreams as well as awareness for self-reflection and thoughtfulness. Great leaders recognize intuition or the “gut feeling.”

As documented by Goleman, Boyatzis, and McKee (2002) “from self-awareness - understanding one’s emotions and being clear about one’s purpose - flows self-management, the focused drive that all leaders need to achieve their goals” (p. 45). The authors compare self-management to an ongoing inner conversation. “It’s what allows the mental clarity and concentrated energy that leadership demands, and what keeps disruptive emotions from throwing us off track. Leaders with such self-mastery embody an upbeat, optimistic enthusiasm that tunes resonance to the positive range” (p. 46).

Another component of emotional intelligence is social awareness, or as the authors describes it “empathy.” “Of all the dimensions of emotional intelligence, social awareness may be the most easily recognized” (p. 49). As established by Goleman, Boyatzis, and McKee (2002) “empathy means taking employees’ feelings into thoughtful consideration and then making intelligent decisions that work those feelings into the response” (p. 50). The authors take this thought one step further by stating, “When leaders are able to grasp other people’s feelings and perspectives, they access a potent emotional guidance system that keeps what they say and do on track. As such, empathy is the sine qua non of all social effectiveness in working life” (p. 50).

Relationship management is the final component of emotional intelligence. “Relationship management is friendliness with a purpose: moving people in the right direction, whether that’s agreement on a marketing strategy or enthusiasm about a new project” (Goleman, Boyatzis & McKee, 2002, p. 51). The authors define authenticity as acting from one’s genuine feelings. “Once leaders have attuned to their own vision and values, steadied in the positive emotional range, and tuned into the emotions of the group, then relationship management skills let them interact in ways that catalyze resonance” (p. 51).

Click Here to access Figure 1<sup>4</sup>

(Adapted from information: Goleman, Boyatzis, McKee, 2002, pp.253-256)

Figure 1 displays the conceptual framework for EI, based on the research of Goleman, Boyatzis and McKee (2002) and their theory of emotional intelligence. “Emotional intelligence is the capacity for recognizing our own feelings and the feelings of others, for motivating ourselves and for managing emotions effectively in ourselves and others. An emotional competence is a learned capacity based on emotional intelligence that contributes to the effective performance at work” (Hay Group, 2002). Included in Figure 1 are the four areas of emotional intelligence that have been identified for effective leadership as well as the competencies.

#### Summary

“My primary role as an EI theorist has been to propose a theory of performance that builds on the EI model, adapting it to predict personal effectiveness at work and in leadership.”

(Goleman, 1998)

Emotional intelligence characteristics have been recognized as positive attributes in effective leaders. The characteristics are attributes associated with success and the frequency of the “emotional” trait was strong, as cited by Kouzes and Posner, (2002) Maxwell, (1999) and Sergiovanni (1992). The question remains, how do we prepare and mentor future administrators for success in leading transformational change in our school system? As defined in the Standards for Advanced Programs in Educational Leadership (2002), Standard 4.0 states, “Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by collaborating with families and other community members, responding to diverse community interests and needs, and mobilizing community resources” (p. 9). The clusters, competencies and attributes defined by emotional intelligence directly relate to the three elements presented in this standard. In order for collaboration, response and mobilization to occur, self-reflection on the part of the leader is the starting point for successful relationships within the school community. To promote success for all students, leaders must become acquainted with the areas related to emotional intelligence and the competencies necessary to be successful.

Educational leadership programs should include emotional intelligence theory as a component for reform. Programs have been focusing on the development of course content; the time has come to embrace the research on emotional intelligence and provide a balanced approach. As Dewey advocated the teaching of the “whole child” for maximum gains, so should programs for leadership include the social, emotional, intellectual and physical components. It is through the combination of these focused areas that transference of meaningful change will take place in our schools.

<sup>4</sup><http://cnx.org/content/m15615/latest/figure1EI.pdf>

Strong leadership development processes are focused on emotional and intellectual learning and they build on active participatory work: action learning and coaching, where people used what they're learning to diagnose and solve real problems in their organizations.

(Goleman, Boyatzis, & McKee, 2002, p. 234.)

#### REFERENCES

- Bolman, L., & Deal, T. E. (2002). Leading with soul and spirit. [Electronic version]. *School Administrator*, 59(2), 21-26.
- Bulach, C. R., Michael, P., & Boothe, D. (1999). Analyzing the leadership behaviors of school principals. Paper presented at the Association for the Advancement of Educational Research Conference. Retrieved November 4, 2003, from <http://www.westga.edu/~sclimate/lsp.htm><sup>5</sup>.
- Cherniss, C. (2000). Emotional intelligence: What is it and why it matters. Paper presented at the annual meeting of the Society for Industrial Organizational Psychology. Rutgers University, Graduate School of Applied and Professional Psychology. Web site: [www.eiconsortium](http://www.eiconsortium.com)<sup>6</sup>.
- Chopra, D. (2002). The soul of leadership. [Electronic version]. *School Administrator*, 59(8), 10-13.
- Covey, S. R. (1989). *The seven habits of highly effective people*. New York: Free Press.
- Darling-Hammond, L., LaPointe, M., Meyerson, D., Orr, M. T., & Cohen, C. (2007). *Preparing School Leaders for a Changing World: Lessons from Exemplary Leadership Development Programs*. Stanford, CA: Stanford University, Stanford Educational Leadership Institute.
- Deal, T. E., & Peterson, K. D. (1994). *The leadership paradox: Balancing logic and artistry in schools*. San Francisco, CA: Jossey-Bass Inc.
- Fullan, M. (2000). Leadership for the twenty-first century: Breaking the bonds of dependency. *The Jossey-Bass Reader on Educational Leadership*, 156-163. San Francisco, CA: Jossey-Bass Inc.
- Goffee, R., & Jones, G. (2000, September-October). [Electronic version]. *Harvard Business Review*, 15-27.
- Goleman, D. (1998). *Working with emotional intelligence*. New York: Bantam Books.
- Goleman, D. (1998, November-December). What makes a leader? [Electronic version]. *Harvard Business Review*, 93-102.
- Goleman, D., Boyatzis, R., & McKee, A. (2002). *Primal leadership: Realizing the power of emotional intelligence*. Boston, MA: Harvard Business School Publishing.
- Hargreaves, A., & Fullan, M. (1998). *What's worth fighting for out there*. Canada: Ontario Public School Teachers' Federation.
- Hausman, C., Crow, G. M., & Sperry, D. (2000, September). Portrait of the "ideal principal": Context and self. [Electronic version]. *NASSP Bulletin*, 84(617), 5-14.
- Hay Group, McClelland Center for Research and Innovation (2002). *Emotional competence inventory (ECI) technical manual (1st ed.)*. Boston, MA.
- Kets de Vries, M. R. (2004, January). Putting leaders on the couch. *Harvard Business Review*. Retrieved January 23, 2004, from <http://harvardbusinessonline.hbsp.harvard.edu/b01/en/hbr/hbrsa/current/0401/article/r0401F7><sup>7</sup>.
- Kouzes, J. M., & Posner, B. Z. (2002). *The leadership challenge*. San Francisco, CA: Jossey-Bass Inc.
- Marzano, R. (2003). *What works in schools*. Alexandria, VA: Association for Supervision and Curriculum Development (ASCD).
- Maxwell, J. (1999). *The 21 indispensable qualities of a leader*. Tennessee: Thomas Nelson Inc.
- National Policy Board for Educational Administration (2002). *Standards for advanced programs in educational leadership for principals, superintendents, curriculum directors and supervisors*.
- Sergionanni, T. (1982). Ten principles of quality leadership. [Electronic version]. *Educational Leadership*, 39(5), 330-336.
- Sergiovanni, T. J. (1992). *Moral leadership: Getting to the heart of school improvement*. San Francisco, CA: Jossey-Bass Inc.

<sup>5</sup><http://www.westga.edu/~sclimate/lsp.htm>

<sup>6</sup><http://www.eiconsortium.com>

<sup>7</sup><http://harvardbusinessonline.hbsp.harvard.edu/b01/en/hbr/hbrsa/current/0401/arti>

Sergiovanni, T. J. (1996). *Leadership for the schoolhouse: How is it different? How is it important?* San Francisco, CA: Jossey-Bass Inc.

Sergiovanni, T. J., & Starratt, R. J. (1998). *Supervision: A redefinition.* San Francisco, CA: McGraw-Hill Companies Inc.

Sokolow, S. (2002). Enlightened leadership. [Electronic version]. *School Administrator*, 58(8), 32-36.

Tichy, N. M. (1997). *The leadership engine: How winning companies build leaders at every level.* New York: HarperCollins Publishers.

Yukl, G. (1994). *Leadership in organizations.* Englewood Cliffs, NJ: Prentice-Hall Inc.

### 4.3 Emotional, Social and Personality Development<sup>8</sup>

- In various studies, acceleration and deceleration in the aggressive behavior of nursery school children was shown to be linked to either positive or negative reinforcing reactions of other children. Positive reinforces for aggression were not approval or attention but crying, passivity, and defensiveness of the victim.<sup>9</sup>
- In other studies, the ability of a child to acquire friends was limited by coercive socialization in the family and peer group – acquired friends were likely to be aggressive and antisocial as well.<sup>10</sup> Among those children, communication with friends likely emphasizes deviant behavior<sup>11</sup> to involve conflict and assertiveness – this leads to acceleration of troublesome, antisocial behavior.

Obviously, emphasis and promotion of certain qualities will lead to those qualities developing over time. Over time certain characteristics or personality traits develop - they do so dependent on the age, special population, and environment of the person. So those studies were examples of how emotional development works. Because children talk to their friends about bullying, they become bigger bullies themselves. It is almost like they are consciously and deliberately forming their own development. Also, what comes along with becoming bigger bullies, is learning how to be good at bullying, almost a bullying competency. Such a thing is hard to measure, so my point is that the activities which lead to development become an integral part of the person and influences other aspects of their personality. Bullying might have the effect of making both the bully and the abused tougher as people, because they are exposed to harsh emotions and become more resilient because of that. Unless a bully constantly feels bad about what he/she did in the past, or the abused forever reflects in sadness on the bullying, the experience is probably going to be something for both parties to learn and develop from. Exposure to more emotion is probably going to lead to more development as long it doesn't hinder the person. People can grow (or have their personality traits change) from all types of emotion and experience.

- Piaget had the idea that children advanced more cognitively from conflict interactions with peers than with conflict interactions with adults. Children generally accept that adults have greater knowledge about the world than they do, and so yield to the adults point of view. In contrast, peer interaction forces children to coordinate or restructure their own views.<sup>12</sup>

Because children are at a similar intellectual and emotional level as other children, their confidence and smoothness in interacting is probably going to be higher. Also, similar interests and physical development would lead to greater identification. Kids could view adults to see how they can improve, and with children their own age they can identify and become more comfortable with themselves.

<sup>8</sup>This content is available online at <<http://cnx.org/content/m33455/1.4/>>.

<sup>9</sup>Patterson, G.R., Littman, R. A., & Bricker, W. (1967). Assertive behavior in children : A step toward a theory of aggression. *Monographs of the Society for Research in Child Development*, 32 (5, Serial No. 113).

<sup>10</sup>Patterson, G. R., Reid, J. B., & Dishon, T. J. (1992). *Antisocial Boys.* Eugene, OR: Castalia.

<sup>11</sup>Poulin, F. Dishion, T. J., & Haas, E. (1999). The peer influence paradox: Friendship quality and deviancy training within male adolescent friendships. *Merrill-Palmer Quarterly*, 45, 42-61.

<sup>12</sup>Piaget, J. (1932) *The moral judgment of the child.* Glencoe, IL: Free Press.

- In a volume titled “Identity: Youth and Crisis”<sup>13</sup> Erik Erikson asserted that close relationships with others are not possible until identity development is complete, because intimacy requires knowing and sharing the self.

I think that it makes sense that as self identity develops, relations with others will improve. Not necessarily that identity development needs to be complete – children of all ages can form close relationships even though they haven’t fully developed yet. If animals like dogs can form close relationships, then young children shouldn’t have a problem doing it even though they might not be strong in their identity.

- Three psychoanalytic writers - Harry Stack Sullivan, Peter Blos and Erik Erikson asserted that intimacy, empathy and loyalty in peer relationships emerge mainly in the second decade of life.

In order for close relationships involving empathy, intimacy and loyalty to occur, it makes sense that children would need to be confident with who they are first because without confidence it would be hard to be confident experiencing intimate emotions. Those emotions involve a sense of security that isn’t present unless someone is confident in who they are. It is possible to be close to someone, like how animals can be close to people, but to experience real intimacy, empathy and loyalty a much larger amount of development would need to occur.

- A “behavior system” is a partnership whereby the individual is empathic to the needs and feelings of the partner, and functions to maintain ties between an individual and his or her partners. There are four types of systems believed to dominate interpersonal relationships –attachment, caretaking, affiliative and sexual/reproductive. In the early years the attachments system dominates parent-child relations but in adolescence it functions reconfigured and less prominently in peer and romantic relationships. The affiliative system includes play, cooperation, collaboration and reciprocity is present in initial parent-child relations but later dominates relations between childhood peers.<sup>14</sup> Romantic relationships in adolescence incorporate all four systems.

It is important how the people in relationships view these types of attachments. Someone could become more selfish in a relationship simply by considering the other person as contributing everything in the relationship, instead of viewing the relationship as reciprocal. There is an overlap and similarity between the types of attachment. For instance you could compare an affiliative relationship to a caretaking relationship, and learn from that that maybe even in play there is caretaking. Emotionally there might also be a large overlap, it might feel like a romantic relationship is like a friendship even though you would label the relationship as a romantic one.

- In the first weeks of life, infants can notice each other and respond to cries.
- 6 month olds can touch each other and toys held by peers.<sup>15</sup>
- Conflicts over toys and intrusions on physical space emerge in the last quarter of the first year of life.<sup>16</sup>
- By the end of the first year of life infants can communicate, share, participate in conflict, and form friendships. They can look at, gesture toward, and touch their peers. They can share things of interest with peers by pointing out, showing, and offering objects other children.<sup>17</sup> Infants at the end of the first year can participate in shared activities (spontaneous games) where distinctive actions (rolling a ball or hitting blocks together) in sequence, and alternating turns.<sup>18</sup>

<sup>13</sup>Erikson, E. H. (1968). *Identity: Youth and Crisis*. New York: Norton.

<sup>14</sup>Weiss, R.S. (1986). Continuities and transformations in social relationships from childhood to adulthood. In W.W. Hartup & Rubin, Z. (Eds.), *Relationships and development* (pp.95-111). Hillsdale, NJ: Erlbaum.

<sup>15</sup>Hay, D. F., Nash, A., & Pedersen, J. (1983). Interaction between six-month-old peers. *Child Development*, 52, 1071-1076.

<sup>16</sup>Caplan, M., Vespo, J. E., Pedersen, J., & Hay, D. F. (1991) Conflict and its resolution in small groups of one- and two-year-olds. *Child Development*, 62, 1513-1524.

<sup>17</sup>Eckerman, C. O., Whatley, J. & Kutz, S. L. (1975). Growth of social play with peers during the second year of life. *Developmental Psychology*, 11, 42-49.

<sup>18</sup>Ross, H. S. (1982) Establishment of social games among toddlers. *Developmental Psychology*, 18, 509-518.

How does interaction in the first year of life contribute to the infants development? The conflicts over toys and intrusions on physical space in the last quarter of the first year is significant because it shows that infants are actively engaged with other infants. They are aware enough of their space and other people to feel intruded if their space is endangered. That means they have developed some sort of ego and attitude towards other infants – which must mean that the infants invoke noticeable emotion in each other in order to stimulate a response. The response to cries in the first weeks of life is the beginning of interaction, they begin to notice each other a little then. By 6 months they engage more heavily by touching each other and the other infants toys. Those interactions help to develop and form the infants sense of self, which would cause them to want to defend their space by the last quarter of the first year. By the end of the first year then, they must become cognitively aware of their peers (gesture toward and touch their peers) and cognitively aware of how to participate in trivial games (alternating turns) at the same time. The experience in play before teaches them so they become more intellectual and aware (cognitive) and become capable of more advanced games which involve knowledge and awareness of cooperation (such as alternating turns), and just more advanced games with distinctive actions (like rolling a ball or hitting blocks together).

- During around the pre-school years, it is theorized that play provides a forum for children's self-regulation and emotion regulation. It was theorized early that play can reestablish homeostasis by helping to deplete surplus or replenish expended energy.<sup>19,20</sup> It was suggested by later theorists that play modulates arousal associated with excessively high or low levels of stimulation.<sup>21</sup> Freud suggested that play could be a medium for children to reconstruct and gain mastery over emotionally arousing experiences.<sup>22</sup> That idea is important in the study of the development of children's emotion regulation, which is a set of skills that help people to modify, monitor and evaluate their emotions to produce behavior that is adaptive for situations.<sup>23</sup> Self-regulation is an important skill in the promotion of positive peer interactions.<sup>24</sup> Play can help children master situations that involve intense emotional arousal, and help children regulate emotions and that can help reduce anxiety.

**Importance:** Emotion regulation is similar to regulation of energy states (excitement or arousal) because excitement and arousal are similar to and related to emotions. If someone is very happy, that is likely to contribute to excitement or arousal. So emotion regulation is similar to generic self-regulation. Emotion regulation must be developed at some point, and it makes sense that it is developed when children are first exposed to large amounts of emotion, which is likely to be during preschool play, where they have more increased cognitive, social, language, and social-cognitive skills than before. Those skills help contribute to more emotion being generated because they provide sources of emotion. Language adds a lot of things to get emotional about. A child isn't as likely to get excited as much being with his parents not playing. Emotion regulation is an important part of how people experience emotions. If you gain insight into your emotions from emotion regulation, your emotional experiences might be increased because you are more aware. Developing emotions in the preschool years contributes to how children feel and master emotions. In fact, play in those years is similar to adult interactions, it involves many of the ups and downs and uses similar cognitive abilities. It is like life is being experienced in greater depth, and these experiences form the starting point of feeling. With feeling comes emotion regulation, it is hard to have one without the other.

### Describing Relationships

Hinde<sup>25</sup> (1979) suggested that many of the things that seem to be important about relationships could be classified into ten categories of dimensions (below). They move from properties of the interactions to those of the relationship as a whole, and from primarily behavioral to primarily subjective issues.

<sup>19</sup>Patrick, G. T. W. (1916). *The psychology of relaxation*. Boston: Houghton Mifflin.

<sup>20</sup>Spencer, H. (1873). *Principles of psychology* (Vol. 2, 2<sup>nd</sup> ed.). New York: Appleton.

<sup>21</sup>Berlyne, D. E. (1960). *Conflict, arousal and curiosity*. New York: McGraw-Hill.

<sup>22</sup>Freud, S. (1961). *Beyond the pleasure principle*. New York: Norton.

<sup>23</sup>Walden, T. A., & Smith, M.C. (1997). Emotion regulation. *Motivation and Emotion*, 21, 7-25.

<sup>24</sup>Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, 59, 25-52.

<sup>25</sup>Hinde, R. A. (1979) *Towards understanding relationships*. London: Academic Press.

1. *The content of the interactions* - This refers to the things the participants do together. Most sociological types of relationships are defined by the behaviors involved (the type of relationship e.g. doctor-patient, teacher-pupil, lover) Friendship and kin relationships are obvious exceptions, in that in our culture they are not identified by what the participants actually do together, but by aspects of quality, intimacy, interpersonal perception, commitment, etc.
2. *The diversity of types of interaction within the relationship* - The more things two individuals do together, the more aspects of their personalities are exposed; the more experience is shared.
3. *The qualities of the interactions* - For example, did the participants communicate constructively, competitively, loudly, softly, etc? Analysis of speech and nonverbal communication will provide data here. This is subjective, what someone might think of the quality of an interaction might or might not be a good relationship, this judgement could vary over time, between individuals, and between cultures.
4. *The relative frequency and patterning of interactions*- The extent to which interactions of different sorts or qualities are present; properties derived from the frequency of interactions relative to the frequency with which each partner attempts to initiate them (sometimes people try to ask to do something but it doesn't actually happen); the relations between different kinds of interactions, (the structure of the relationship) such as controlling, permissive, etc, and the patterning of interactions over time.
5. *The reciprocity vs. complementary nature of the interactions* - Reciprocal interactions are those in which the two partners do similar things, such as play the same sport; complementary interactions are those in which they do different things, but those things complement each other. Most close relationships involve a complicated mixture of reciprocal and complementary interactions.
6. *Power and autonomy*- Power and autonomy are complementary, if one increases in one partner the other is likely to decrease in the other partner. One partner could have power over the other if they can influence the consequences or impact of the other persons behavior. Frequently one partner would show power in some content areas while the other in different ones. The amount of power asserted can be measured and assessed (for instance persuasion vs. command). A power differential can be perceived differently by each partner, it can be seen as desirable by both or not. However, well-meaning moves towards closeness by one partner may be seen as constraining and decreasing the autonomy of the other. Lack of agreement or acceptance of where power lies leads to conflict.
7. *Intimacy-the extent to which the participants reveal themselves (emotionally, cognitively, and physically) to each other*- Intimacy requires the discloser to feel understood, validated, and care for and is thus related to trust. However intimacy has its limits as it may be important to maintain area of privacy.
8. *Interpersonal perception* This category includes things such as "Does A see B as B really is?" "Does A see B as B sees B, i.e., does A understand B?" "Does B feel that A sees B as B sees B, i.e., does B feel understood?" Feeling understood implies understanding at a deeper level and includes an interpretation of the verbal conversations the people have for a more true understanding (such that would lead to a "feeling understood" feeling. Also important is how the participants see the relationship, and also how they see the world, if they see it in a similar fashion they could be closer.
9. *Commitment*.- Do the partners strive to ensure the continuation of the relationship or improve its quality? Does each see the other as committed?
10. *Satisfaction*- Do the participants perceive the relationship as close to their ideal or preferable to alternative relationships?

I can express the above list in a more concise way that will show more effectively the properties of a relationship. Relationships are intimate, however there is power and autonomy involved. People have similarities and do similar things, or they do opposing things and are different. People might have expectations of satisfaction and an idea of what an ideal relationship might be like. That might influence commitment, if it isn't satisfying they are less likely to be motivated for commitment. This is likely to also be related to interpersonal perception, one person might view the other as poor or not the way they are because they want to see things their way. Maybe they find it interesting to see the person in a variety of ways, if a person was single faceted there wouldn't be any strong basis for commitment. Perception is very complicated, people don't just see someone completely accurately immediately or even after a long period of time. If they did



see them accurately there wouldn't be any room for growth and change and dynamics. If you have problems in the relationship resulting from improper perception it could add a lot of content to the relationship. One person could want to see themselves as strong and the other as weak, causing a chaotic interaction which could prove interesting. The other person could constantly be trying to prove themselves. That is one way to put pressure on and provide one type of satisfaction. Or if they saw the person in an overly good light maybe that would influence how they feel and they'd feel good about the person because they think are very good, better than they actually are. Maybe the entire perception dynamic of all the persons traits is confused and their relationship is just a mess. Having things to work on adds content. Maybe the content, diversity, and quality of their interactions is perceived completely wrong as well.

### Principles of dynamics

The next issue concerns the processes at work in the dynamic flux that every relationship entails. The processes can be understood at three levels- external influences on the relationship, the interchanges between the participants, and the internal processes that occur in each person.

1. *The social context*- The issue here involves social influences on the development of personality, the influence of third parties on relationships, and the dialectical relations with the sociocultural structure (how society communicates with groups, which could communicate to relationships, etc.)
2. *Processes of exchange and interdependence involving resources of various types*. There is an emphasis on the interdependence between partners, and on the manner in which an individual may include the partner in defining his or her goals and rewards. What is considered "fair" may differ based on the type of relationship, and "fairness" may not matter between close friends or kin. There are various types of resources that can be exchanged such as money, services, goods, status, information, and love. Obviously love should be placed in another category than the material ones. There is probably a lot you could say about each of those.
3. *Processes of positive and negative feedback*- Certain patterns of resource exchange (or interaction over a long term) may lead to increasing closeness or distance in the relationship.

## 4.4 Identity Crisis: A Leader's Image is Worth a Thousand Words<sup>26</sup>



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### 4.4.1 Introduction

In reference to transformational leadership theory there is a powerful communication part at work with every leader; yet, generally speaking, that part may go unappreciated and unexplored in the training and practice of educational administrators. In this report of this research study the author articulates, in subsection

<sup>26</sup>This content is available online at <<http://cnx.org/content/m26728/1.1/>>.

<sup>27</sup><http://ijelp.expressacademic.org>

Transformational Leaders are Stewards of Recognizable Vision, that training is needed for educators, particularly for a new way of thinking toward communication; and that a mindset may be preventing educators' development as transformational leaders. Subsections Transformational Leadership Theory and Identity – A Micropolitical Portal to Understanding the author delineates that the training of transformational leaders should encourage a mindset for administrators to communicate expectations of their audiences through the leader's identity; this is a key to effective communication, transforming abstract information into concrete terms through the identity. The savvy leader embodies the values and beliefs of his or her target audiences as a concrete heroic stereotype. Furthering the cause for training, the data collection subsection titled Identity Crisis: Leaders Missing out on an Effective Communication Tool indicates that participants in the author's study didn't know or express interest in how their target audiences identified them. In addition, participants incorrectly ranked a variety of creative and effective communication techniques, such as storytelling, as ineffective; hence, an indication that preservice and inservice training in communication may be beneficial.

#### **4.4.2 Methodology**

Through practice and research the author became intrigued as to how and why some educational leaders' intended vision/mission and subsequent identities became lost or misunderstood. At the same time, communication from leaders in various other fields seemed effortless, yet powerfully effective. Therefore, the purpose of this study was to explore the phenomenon of communication and if the perceived void in communication dynamics of educational leaders may be the result of insufficient training for administrators.

##### **4.4.2.1 Statement of the Problem**

This study is intended to identify creative communication practices recommended by educational leaders to articulate (send) their vision and to have their vision and/or mission received.

##### **4.4.2.2 Method and Instrumentation**

The author's study is a non-experimental naturalistic study in the behavioral sciences, which works with such intangibles as attitudes, emotions and personalities. Since qualitative design facilitates small numbers of subjects and emerging new concepts grounded theory is employed, which indicates this study is qualitative. Study reliability is enhanced by employing a constant in a singular instrument; i.e., standardized open-ended interview and survey, with four questions with the exact wording and sequencing of questions for both instruments. Question five of the questionnaire and survey has 12 attributes in communication that participants rank in four categories such "very effective" to "not at all effective"; those results are provided in tables A, B and C.

##### **4.4.2.3 Data and Limitations**

Data were collected for the study during spring and summer of 2007 from three school districts in a suburban region of a metropolitan area in the southwestern United States. Criteria for districts selected in the study were based on the majority of schools within districts having state learning label rankings as "excelling or "highly performing". Forty-one subjects participated in this study: three superintendents, nine school board members and 29 principals. Fifty-one percent of participants were female. Eighty three percent of the participants described themselves as experienced in mid-career, while 17 percent represented themselves as new and in their early career. Ninety-three percent of participants were White and seven percent Hispanic.

Limitations inherent in this study may include attaining approximately 50 percent of the anticipated 70 percent of the response rate of the population canvassed. This means that the non-respondents may or may not be systematically different from the respondents on the target variables.

### 4.4.3 Transformational Leadership Theory

The theoretical framework for this study is transformational leadership theory, otherwise known as charismatic leadership theory or social entrepreneurship (Purdue, 2001). According to Aldoory & Toth (2004) and Mackenzie, Podsacoff and Rich (2001), transformational leadership theory is the most widely used, widely studied and positively effective leadership theory. The skill-set characteristic for these leaders is proficiency in articulating their vision and/or missions verbally, and particularly nonverbally, for resonance and change in followers as described by Axelsson, Kullen-Engstrom and Edgren (2000) and Bennis (2007). Transformational leaders create trust and enthusiasm to motivate followers to change or persevere through dark times by appealing to and sharing in their high ideals, moral values and optimism about the future (Burns, 1978; Mackenzie et al. 2001). There is an assumed promise that followers somehow will be transformed by the leader's vision and/or mission, becoming somewhat a spiritual product of the leader's collaborative purpose with which they have identified and internalized. For example, Senge (1990) states that shared vision is not an idea but rather a force in people's hearts. The adoration of Nelson Mandela and the slave gladiator Spartacus was not due to their status as people but rather as icons or symbols of liberation and autonomy – core values – with which their followers identified. The transformational leader's personal integrity is critical in the process of leading by example – walking the talk – according to Burns (1978), Mackenzie et al. (2001) and Wendt & Fairhurst (1994). The transformational leader is always visible and his or her attitudes and actions model proper behavior to everyone else. Mackenzie et al. (2001); Bass, (1995) and Popper (2004) state that the transformational leader becomes an image, identity or an appropriate role model to guide and symbolize expected values and behaviors of followers; essentially crafting a vision, which is a symbolic process of lacing the message with metaphors, stories and other colorful emotional language, according to Aldoory & Toth (2004); Axelsson et. al. (2000); and Hoy & Miskel (2001).

Deal (1985) as cited in Hoy & Miskel (2001) asserted that principals of effective schools take up the hero or heroine role that embodies core values. Takala (1998) describes the transformational style of leadership as “symbolic leading” evoking patterns of meaning by creating symbolic reality (p. 796). Hoy & Miskel stress that leaders are managers of meaning who exhibit “inspirational, visionary and symbolic or less rationalistic aspects of behavior” (2001p.409); for example:

- “Leaders are managers of meaning” (p.409)
- “Meaning is transferred symbolically” (p.185)
- “Leadership is a symbolic activity” (p.437)

### 4.4.4 Identity - Micropolitical Interpretive Portals to Understanding

To help the administrator conceive of the transformational leadership mindset that may assist in sharpening his or her sending skills, there is a field of literature consistent with transformational leadership theory, which pertains to the perceptive processes in communication. Exposure to this field may help leaders in examining their sending and receiving skills methodology through theories such as Interactionist Labeling Theory (ILT), Social Exchange Theory (SET) and Symbolic Interactionism (SI). From a social/emotional psychological perspective noted sociologists Mead, Blumer and Homas, for example, describe in these theories that people's responses to things are not made directly but rather based on the meaning they ascribe to those things; interpretations made based on the meaning that they attach to one another's actions (Blumer, 1969). On a large scale, for example, Carl's Jr. and In-N-Out Burger advertise in red and yellow because these primary colors are believed to generate hunger in people by symbolically representing ketchup and mustard. Nicknames and other symbolisms such as metaphor and rituals are representative as well and central to ILT, SET and SI, which is at issue in this study; they act as micropolitical interpretive portals to understanding. Micropolitical portals are a communicating part or area of an organism (Mish et al., 2002). In other words, within the context of this article a micropolitical portal is the leader's identity.

For example, Fortado (1998) conducted a study exploring the significance of nicknames in workplace environments as well as the effects of epithets within those environments. The study was based on six case scenario field observations and interviews. Fortado explained that little analytical attention has been focused

on workplace nicknames because nicknames were ubiquitous and had a seemingly silly nonsensical nature. However, through his study Fortado determined that nicknames should be thought of as key symbols that unlock many meanings. Fortado cautioned that derogatory nicknames can reform a targeted person's image so deleteriously that functioning becomes difficult and can even cause a loss of credibility and employment. Fortado illustrates that an eighth grade public school house administrator was let go due to perceptions that such nicknames represented for him. Teachers called the administrator a "pussycat" because he lacked assertiveness while students called a group of female peers whom the administrator was perceived to favor as "the Bosettes". The house administrator's name was Mr. Bosley, and he was well liked by many students but not respected by staff and a segment of the student body since his behavior didn't appear professional or appropriate. Mr. Bosley's critics suggested he was a pedophile, although proof of the allegations wasn't known.

Fortado posits that people in power become the butt of jokes and sarcasm. Subordinates enjoy the tension release that comes with socially reforming or denigrating their superior's image. "Names are thus a core part of a person's identity and often have a status associated with them" (p.14). Monikers serve as sign posts delimiting boundaries and framework, or, in other words, expectations. Epithets can be used positively as a sign of intimacy based on gaffes and personal traits such as relatives affectionately naming a complaining family member as grumpy. Slick Willy and Tricky Dick are disparaging political epithets etched in the American vernacular. Fortado suggests in his study that adroitly engaging in activities that bring on desirable sobriquets should be within the mindset and strategy of the education leader and his or her training, such as the earned nickname of "little miss empowerment" by a study participant described later in this manuscript.

In another pertinent example, Fortado cites an investigation titled The Hawthorne study in The Bank Wiring Room (Roethlisberger and Dickson (1939) as cited in Fortado (1998)). The study found that nicknames were used as peer pressure for coworkers to either slow down or speed up production by being called speed king or snail, for example. The essence of Fortado's study is that nicknames, i.e., identities, often convey potent meaning, furthering social control, creating group boundaries and building camaraderie. Nicknames are often key symbols that serve as clues to critical themes, orientations and values, according to Benedict (1934) and Ortner, (1973) as cited in Fortado (1998)). Interpretive portals can be opened if educational leaders make use of these keys rather than overlooking them as the author suggests may be the case in this study.

In the sphere of Social Exchange Theory and Symbolic Interactionism nicknames resonate exponentially in reciprocal fashion. Therefore, much symbolism is communicated throughout the workplace environment, so the opportunity for symbolic communication is prevalent and exists throughout organizational cultures such as schools and districts. Maclean (2007) describes this labeling or nicknaming, which gives shape to a leader or superior's identity, as the interpretive framework which creates meaning and expectations within organizational cultures. Frameworks influence a variety of outcomes. Frames aid people in organizations to understand and predict their environment. They are manifested in organization culture by key words, catch phrases, metaphors, images and other symbolic acts. For example, John McCain's 2008 presidential running mate, Alaskan Governor Sarah Palin, utilized key words to identify herself as a traditional candidate with *Leave it to Beaver* catch phrases such as "you betcha", "darn right" and "dontcha know". Highlighting a familiar image placing Wall Street excesses on eBay in her predecessor's Lear Jet was intended to symbolize the values and beliefs the public could expect of the candidate. Educational leaders' communication prowess, and potential success, can be strategically enhanced by developing a mindset for framing expectations through their identities as described through the preceding examples of ILT, SET and SI.

#### 4.4.4.1 Proficient Communicators Know How to Set the Right Expectation

Maclean's interpretive framework applies to educational leaders since the community must know the principal, for example, in order to know what to expect from the school, according to Hoy & Miskel (2001). They report that wise leaders in education develop sending skills that enable them to set the right expectations while avoiding vision and/or mission ambiguities. For instance, United States Secretary of Education Roderick Paige (2001-2005) stressed that raising the performance of students requires raising expectations

(Keebler, 2001). Roderick Paige applied emotional language described in transformational leadership theory by employing a consistent theme and accountability that reading was the new civil rights issue while thwarting “the soft bigotry” of low expectations (Roach & Dervarics, 2001, p. 26). Through his actions and rhetoric Dr. Paige was strategically framing, within his environment, a higher performance creed of expectation otherwise known as a “psychological contract” – an emotional-laden understanding (Cha, 2004, p.1). For those expectations to take hold followers must have confidence, respect and trust in the leader; therefore, the leader’s words and actions, i.e., sending methodologies, must “tally” (walk the talk) or followers interpret a “dual message” and the meaning cannot establish a clear framework (Axelsson et al., 2000, p.1). There must be congruence in verbal and nonverbal messaging to avoid any distraction from the vision and/or mission framing.

An Arizona sheriff, Maricopa County Sheriff Joe Arpaio, became a household name by establishing a clear framework, which earned him the national reputation as America’s Toughest Cop (Jarvis, 2003). He accomplished this notoriety by talking tough and employing powerful symbolisms such as dressing prisoners in traditional black and white stripes, highly visible, cleaning roadside debris in ritualistic chain gangs. Arpaio’s example is consistent with transformational leadership theory that leadership is a symbolic activity. The image should be used to symbolize and frame expected and valued behavior for the leader’s target audience.

Arpaio’s and Dr. Paige’s interpretive framing manages meaning, which produces expectations for behaviors and actions of leaders and followers (Wendt & Fairhurst, 1994). Patrons need to know what they can expect of a principal, and principals need to know that problems usually occur because of missed expectations due to sending ambiguities (Hoy & Miskel (2001); Martin (2004)).

#### **4.4.4.2 Transformational Leader Sending – The Heroic Stereotype**

The modus operandi with both Roderick Paige and Sheriff Joe’s communication style are clearly transformational. Both employ a heroic role-model motif which simplifies expectations and frames their message. Emotional symbolism such as Dr. Paige’s reference to Civil Rights and bigotry and Sheriff Arpaio’s tough chain gang images ‘strikes a chord’ with followers because followers value what these symbolisms represent.

The heroic stereotype (Cornog, 1991), which is expected of the leader, is a way to refine and simplify the abstract of the leader’s personal brand identity. For example, as a deterrent to bullying and after-school conflicts, the selfless act of a principal regularly walking particular students home simplifies the abstract of all the principal means to a school: that he or she really cares. The impression that the principal (leader) cares and sacrifices for his or her students is expected. A savvy leader embodies his or her audiences’ values and projects as concretely as possible such as visibly looking after the safety and well being of the children. Leaders framing and embodying followers’ values in this way is known as projecting a culturally defined family of concepts or core of expectations (core values), which creates a set of understanding and long-term expectations (Kerfoot (2003); Pettigrew (1979) as cited in Ramsey (2006)). The leader sustains followers’ motivations and enthusiasm through the use of culturally oriented symbolic systems as ceremony, ritual, icons, actions and myths such as storytelling (Axelsson et al. (2000); Bass (1985); Hoy and Miskel (2001)).

#### **4.4.5 Transformational Leaders Are the Stewards of Recognizable Vision**

Research suggests that preservice and or inservice training in effective communication for educational leaders should focus on mindset (Conger (1991); Gamage & Ueyama (2004)). Educational leaders must be encouraged to assume primary responsibility for vision sending and frame-working to manage meaning in their organizational environments.

Conceptualizing the basic realities of leadership, the author often refers to a Disney animation – one of many benefits from early years parenting young children. In a scene from the blockbuster *The Lion King*, Simba, the heir and King Mufasa’s son, gets a lesson about leadership while subjected to despair by his evil uncle, Scar. When everything went wrong for Simba, Scar lectured that the first lesson in leadership was that everything is your fault. In the subsection Transformational Leadership Theory leaders are expected to

be role models - not failures - appealing to audiences' high ideals and optimism about the future, as well as leading by example; i.e., walking the talk.

Many expectations and responsibilities are inherent in leadership particularly with communicating vision and meaning effectively. For example, at a long-term care facility in Canada, 319 employees were queried with two different surveys (Bass & Avolio (1995); Carless, Wearing, & Mann (2000)). The surveys investigating transformational leadership's dimension overlapped in their results, concluding that the ability to communicate vision is a primary leadership attribute (Arnold, Turn, Barling, Kelloway, & McKee (2007)).

Vision communication defines a leader's organizational performance acumen as one who articulates a vision and gets others to follow him or her, with that vision as a unifier in common purpose and direction (Slenning (2000); Wolvin (2005)). This ability to motivate others through effective vision communication is considered the defining attribute of leadership by communication experts and many national organizations: top leaders are stewards of clear and recognizable vision (Kaplin (2006); Martin, Wright, & Danzig (2003)).

As stated by Maslow (1970), people have an inherent need for meaning; transformational leaders understand and approach leadership with that knowledge. Hoepfner (1997) states that leaders assume the task of making meaning out of events. Leaders help others understand the context for which activities occur; therefore, framing, making meaning, is a central activity of leadership, according to Martin et al. (2003) Popper, (2004) Reynolds, Murrill, & Whitt (2006) Senge (1990) Smith (1987) and Takala (1998).

#### **4.4.5.1 Culture Shock Experiences Are Due to Principals' Lack of Preparedness**

Although communication has become instant on a global scale, improving technologies provides no guarantee of better understanding. Researchers acknowledge an apparent information and training deficiency and recommend the shortcoming be addressed in the area of leadership communication. For example, Deresh and Male (2000) as seen in Gamage and Ueyama (2004) equate the fledgling principalship with the United States and British head teachers as "culture shock experiences" due to their lack of preparedness (p. 66). According to Gamage and Ueyama the lack of preparedness, in particular, is found in the area of effective communication. Surveying hundreds of Australian and Japanese school principals, Gamage and Ueyama discovered that principals consider effective communication to be the most important skill in contemporary educational leadership.

In the author's work and study of K-12 educational leaders he became mindful of a possible crossover, i.e., cross-fertilization or cross-pollination, from other fields in leadership that may apply to education, and vice versa. Emrich, Brown, Feldman & Garland (2001) and Wendt & Fairhurst (1994) described this cross-pollination in terms of a crossover between the political and organizational arenas. Therefore, a study conducted by Brown, Martinez and Daniel (2002) is applicable to the author's study of K-12 leaders. In their survey, hundreds of community college administrators identified communication skills as one of the most important skills in community college leadership. They emphasized that aspiring educational leaders and trainers of educators would be prudent to include coursework specific to communication in order to be adequately prepared for the role of leadership. Brown et al. reported in their 2001 study that sixty-five percent of their surveyed skills, primarily communication, were recommended by graduates with greater emphasis than those which they received in their graduate program of studies.

#### **4.4.5.2 Resistance Mindset Prevents Development of Transformational Leaders**

Through practice and research the author has come to the realization that creative and effective communication is not a given or innate to many educational leaders. The author has explored to what degree the perceived gap in communication knowledge is contributed by some educators' mindsets in recent history. Roderick Paige, for example, referred to the need for change in educators' mindset as the prescription for solving many problems in American education. In a January 2001 speech at The National Association of Independent Colleges, Paige (2001) clarified that what is needed for improved student performance is "a new way of thinking" rather than "a few new programs" (p. 30). Morris & Vrabell (1979) reported that the Sputnik shock and successful 1957 Soviet satellite launch were worsened, for instance, due to the lack of public school public relations, and years later, administrators still resist better community relations. To

make matters worse, Conger (1991) asserted that business culture and educational systems may discourage strategies for powerful communication.

#### 4.4.6 Identity Crisis: Leaders Missing Out on An Effective Communication Tool

The resistance phenomenon appears ongoing considering empirical data collected, by the author, in the spring and summer of 2007. For instance, during the outset of interviews in this study many participants appeared to have reacted negatively toward particular questions asked during the questionnaire process. At first glance at the questionnaire from the author's study an elementary school principal rolled his eyes, gestured upward with the questionnaire in hand, and commented "what sky did this fall out of?" Surprised, the author asked what the principal meant by the comment, and the principal answered "never mind". The principal was reacting to the first question of the questionnaire which asked "What is your current vision/mission?" Providing further instruction for participants, the question followed with a helpful example of such vision, citing JFK's "a man on the moon by the end of the 1960's". The principal may or may not have been repudiating the 'vision thing' with his gestures and comment.

In another example of what may or may not have been negativity toward creative vision communication, a high school principal commented about "novelty" while answering questions in the Participant Ranking Matrix – provided in tables A, B and C. The principal commented that he would like to think of himself communicating in novel ways, "but I'm not taking the word novelty; to me, I don't know, it's something that can be seen through, perhaps."

The preceding sampling of comments may or may not be reflective of educational leaders' resistance mindsets toward creative transformational leadership communication; however, 68 percent of the leaders in the author's 2007 study proved a serious disconnect in their approach and knowledge in communication. For instance, thirty-four of 41 administrators, 83 percent, from the three school districts in the study made 45 references to themselves as role models as a means for communicating (sending) their vision/mission. Additionally, administrators overwhelmingly ranked "actions" (i.e., a nonverbal activity) highest for effective sending in the Participant Ranking Matrix provided, again, in tables A, B and C. Nonverbal symbolic communication such as role modeling and action sending are ideal and effective communication methods as recommended in studies such as Axelsson et al. (2000) and Baum, Locke and Kirkpatrick (1998). In this respect, participants in the author's study employ effective transformational, creative sending and framing methodologies. However, 28 of 41 of the same participating administrators, 68 percent, didn't know or express interest in the image that resulted of them from all of their purposeful role modeling action sending or frame-working they employed. According to transformational theory this is a serious disconnect, since followers are expected to identify with and internalize the leader's vision and/or mission.

Role modeling is effective and can be very creative; then again, role modeling is only part of the equation, according to transformational theory. The leader is the sum of his or her verbal and non-verbal communicating parts and that sum is the leader's resulting identity or image that simplifies and frames expectations, according to subsections of this report Transformational Leadership Theory and Identity – A Micropolitical Portal to Understanding. Educational leaders are missing out on a very powerful communication tool when they overlook or are unaware of their image that followers may or may not internalize.

The dilemma for participants in the author's study is that they didn't know or express interest in how their target audience or community identified them. Hence, the identity crisis and mindset that has intrigued the author is the topic of this study. This perceived inconsistency or gap may be the result of a lack of substantive communication skill and training for practicing and aspiring administrators.

Elaborating on the necessity for training, the author incurred what may or may not be negativity toward transformational leadership communication, which transpired during the interviewing process on questionnaire items number 3 and 4. As indicated, participants were asked about the identity they personally desired and how they were actually identified by patrons – questionnaire item numbers 3 and 4. Questionnaire item 3 asked: "how do these methods, i.e., methods queried in questionnaire question 2, communicate the identity you personally desire?" Questionnaire item 4 served as a check for questionnaire item 3 to query if the respondent actually accomplished his or her desired identity by asking in question 4 "How do most people identify you? Please provide a specific example in a tagline nickname or other distinctive title given you

by others; not your own declaration.” Participants’ receptions were mixed to these particular questions, 3 and 4. The majority of respondents didn’t appear to react positively or negatively to questions 3 or 4; instead, they appeared to simply answer the question as best as they could. A few participants who provided creative sending methodologies, consistent with transformational theory, in response to questionnaire item 2 commented approvingly immediately after pondering question 3 and 4 by stating that the questions were very interesting. One respondent elaborated, “I know where you’re going with that one,” stating she understood the frame-working and expectations an identity sends. On the other hand, another participant appeared to react negatively and uncomfortably to questions 3 and 4. A school board member who arranged her interview with the author at a Starbucks halfway point provided an animated reaction to the questions. After searching for words to the questions 3 and 4, providing no definitive answer, she leaned over the little coffee table between herself and the author and gestured, “What? Do people have little pet names for us we don’t know about?”

Generally, participants’ responses were not disparaging but nonetheless revealing of educators’ mindsets. Participants were either unaware of or uninterested in their identity. For instance, a principal responded to questionnaire items 3 and 4 by stating that “It’s difficult to see yourself that way;” i.e., an image. Another administrator stated in absolute terms that she had no knowledge about her identity in her community: “That’s a hard one; nobody talks to us.”

These anecdotal examples are representative of 68 percent of respondents’ not knowing or expressing interest in their identities. The data illustrate a potential need, comparing and contrasting the 68 percent who did not know or expressed concerns about their identity with the 83 percent who should know since recommending role modeling sending as a means in articulating their vision/mission.

The need exemplified in this study is for training. The literature and data collected indicate training may be needed particularly in the shifting of mindset for many educational leaders toward understanding the factor their identities play in successfully communicating; i.e., transformational leadership sending and framing vision and/or mission successfully.

#### 4.4.6.1 Additional Data Findings to Support the Need for Training

Verbatim, six of 41 of the author’s study participants used the metaphor “Walking the talk” to describe their role modeling and action sending as a means of communicating their vision and/or missions. Essentially, walking the talk is familiar language in the educational leader’s lexicon that effective communication was about “not saying something [and] then acting another way.” Participants reflecting transformational leadership characteristics understood the verbal and nonverbal connection in their messaging and that ambiguity in that messaging would detract from their identity. Moreover, Baum et al. (1998) and Wendt & Fairhurst (1994) reported that a well-formulated vision was not enough; that the leader must walk the talk. For example, a principal in the author’s study endeavored to foster an empowering identity and she succeeded by respecting and trusting her staff, in language and deed, and earned the moniker “little miss empowerment”.

The majority of participants in the author’s study were unaware of the effective and creative communication opportunities available. Many were also unaware of the effects of the techniques they regularly practiced. Paradoxically, participants ranked verbal communication as more effective than nonverbal communication, yet actions (nonverbal) ranked highest among all 12 methods queried reflected in the Participant Ranking Matrix Tables A, B and C. Consequently, the literature indicates that nonverbal symbolism is the most effective form of communication, according to Axelsson et al. (2000) Baum et al. (1998) and Johnson (1990).

Participants ranked the effectiveness of communication in the ritual method as very low, yet all of them conducted rituals in their schools such as AM announcements, recognition ceremonies, protocols, etc. Most respondents told stories during interviews, yet storytelling ranked low as an effective and creative communication method. Only three out of 41 participants mentioned or recommended using story directly. Ritual and storytelling are recommended communication techniques as described in transformational leadership theory.



#### 4.4.7 Conclusions and Implications

A supply/demand theme emerged through the author's attempt to address this study's problem: identifying practices educational leaders recommend to articulating (sending) their vision. Demand for training of educational leaders took form in subsections Transformational Leaders are the Stewards of Recognizable Vision and Identity Crisis: Leaders Missing out on an Effective Communication Tool. The defining attribute in leadership is the ability to communicate a vision and the apparent lack of preparedness, in this skill area, results in culture shock experiences for new administrators. Literature and study data indicate there may be a resistance mindset from educators toward visionary transformational leadership communication. The methodological supply to remedy this problem in practice and philosophy is outlined in the subsection Transformational Leadership Theory and Identity – Micropolitical Interpretive Portals to Understanding. The savvy leader understands that he or she is an identity or appropriate role model to symbolize expected values and behaviors of followers, creating the “psychological contract” (Cha, 2004, p.1). Simplifying their identities, transformational leaders employ the heroic stereotype motif to make the abstract of their vision intuitively concrete through culturally orientated symbol systems such as ceremony, ritual, icons, actions and myths such as storytelling.

Educators who fail to define themselves succinctly may well be leaving to others, not having their best interest at heart, the framing of their identity, which is the implication in this study. William F. Buckley Jr.'s cousin and founder/president of The Media Research Center, L. Brent Bozell, declared that the lesson in politics – The cardinal rule in politics – is to “define or be defined” (Eberhart, 2009 p.1). The implications as described by Hoy & Misckel (2001) and Mintzberg (1983) are that politics is a fact of life and important force in educational leadership; therefore, it seems appropriate that communication training for educational leaders should be cross-pollinated with political science practice and theory.

#### 4.4.8 References

- Aldoory, L., & Toth, E. (2004). Leadership and gender in Public relations: Perceived effectiveness on transformational and transactional leadership styles. *Journal of Public Relations Research*, 16(2), 157-183.
- Arnold, A. K., Turn, N., Barling, J., Kelloway K. E., & McKee, M. C. (2007). Transformational leadership and psychology well-being: The mediating role of meaningful work. *Journal of Occupational Health Psychology*, 12(3), 193-203.
- Axelsson, L., Kullen-Engstrom, A., & Edgren, L. (2000). Management vs. symbolic leadership and hospitals in transition: A Swedish example. *Journal of Nursing Management*, 8(3), 167-173.
- Bass, B. M. (1985). *Leadership and performance beyond expectation*. New York: Free Press.
- Bass, B. M., & Avolio, B. J. (1995). *MLQ Multifactor Leadership Questionnaire* (2<sup>nd</sup> ed.) edwood City, CA: Mind Garden.
- Baum, J. R., Locke, E. A., & Kirkpatrick, S. A. (1998). A longitudinal study of the relation of vision and vision communication to venture growth in entrepreneurial firms. *Journal of Applied Psychology*, 83(1), 43-54.
- Bennis, W. (2007). The challenges of leadership in the modern world. *American Psychologist*, 62(1), 2-5.
- Blumer, H (1963). *Symbolic interactionism: Perspectives and method*. Berkeley, CA: University of California Press.
- Brown, L., Martinez, M., & Daniel, D. (2002). Community college leadership preparation: Needs, perspectives, and recommendations. *Community College Review*, 30(1), 45-66.
- Cha, S. E. (2004). Walking the talk: Leadership, ambiguity and perceived commitment to organizational values (Doctoral dissertation, Harvard University, 2004). *Dissertation Abstracts International*, 65(5), 1854.
- Carless, S. A., Wearing, A. J., & Mann, L. (2000). Assessing the discriminant validity of transactional and transformational leadership behavior as measured by the MLQ. *Journal of Occupational and Organizational Psychology*, 71, 353-358.
- Conger, J. A. (1991). Inspiring others: The language of leadership. *The Academy of Management Perspectives*, 5(1), 31-45.

- Cornog, E. (2004). *The power and the story*. New York: Penguin Press.
- Daresh, J., & Male, T. (2000). Crossing the boarder into leadership: Experiences of newly appointed British headteachers and American principals. *Education Management, Administration and Leadership*, 28(1), 89-101.
- Eberhart, D. (2009). Bozell recalls the friendship between Ronald Reagan and Bill Buckley. *Newsmax.com*. Retrieved April 16, 2009 from [http://www.newsmax.com/newsfront/bozell\\_reagan\\_buckley/2009/02/06/179066.html](http://www.newsmax.com/newsfront/bozell_reagan_buckley/2009/02/06/179066.html)
- Emrich, C. G., Brown, H. H., Feldman, J. M., & Garland, H. (2001). Images in words: Presidential rhetoric, charisma, and greatness. *Administrative Science Quarterly*, 46(3), 527-557.
- Fortado, B. (1998). Interpreting nicknames: a micropolitical portal. *Journal of Management Studies*, 35(1), 13-22
- Gamage, D. T., & Ueyama, T. (2004). Professional development perspectives of principals in Australia and Japan. *The Educational Forum*, 69(1), 65-78.
- Hoepfner, M. (1997). Making meaning and care. *Creative Nursing and Care*, 3(2), 2-4.
- Hoy, W. K., & Miskel, C. G. (2001). *Educational administration: Theory, research, and practice* (6th ed.). Boston: McGraw Hill.
- Jarvis, S.E. (2003). [Reviews of the books *peep show: Media and politics in an age of scandal and creating fear; News and the construction of crisis*]. *Political Communication*, 1(2), 197-199
- Johnson, G. (1990). Managing strategic change: The role of symbolic action. *British Journal of Management*, 1(4), 183-200.
- Kaplin, A. S. (2006). Climbing the ladder to CEO part II: Leadership and business acumen. *The Physician Executive*, 32(2), 48-50.
- Keebler, B. (2001). The man who promises to leave no child behind. *Momentum*, 32(2), 16-20.
- Kerfoot, K. (2003). Creating your leadership brand. *MEDSURG Nursing*, 12(2), 132-133.
- Mackenzie, S. B., Podsakoff, P. M., & Rich, G. A. (2001). Transformational and transactional leadership and salesperson performance. *Journal of the Academy of Marketing Science*, 29(2), 115-120.
- MacLean, L.T. (2007). Frame and organization misconduct: A symbolic interactionist study. *Journal of Business Ethics*, 78(3), 3-16.
- Martin, G. (2004, June 26). *Advanced leadership seminar*. Classroom lecture conducted at Northern Arizona University, Flagstaff, Arizona.
- Martin, G. E., Wright W. F., & Danzig A. B. (2003). *School leader internship: Developing, monitoring, and evaluating your leadership experience*. New York: Eye On Education.
- Maslow, A. H. (1970). *Motivation and personality* (2nd ed.). New York: Harper & Row.
- Mintzberg, H. (1983) *Power in and around organizations*. Englewood Cliffs, NJ: Prentice Hall.
- Mish, F. C. et al. (2002). *Miriam-Websters collegiate dictionary* (10th ed). Massachusetts: Miriam-Webster.
- Morris, R., & Vrabal, G. (1979). The role of the principal in public relations. *Theory Into Practice*, 18(1), 50-53.
- Paige, R.R. (2001). Holding schools accountable. *Presidents & Prime Ministers*, 30-33
- Popper, M. (2004). Leadership as relationship. *Journal for the Theory of Social Behaviour*, 34(2), 107-125.
- Purdue, D. (2001). Neighbourhood government: Leadership, trust and social capital. *Urban Studies*, 38(12), 2211-222.
- Ramsey, J. L. (2006). "Distinctively Dickinson:" The evolution of brand at a liberal arts college (Doctoral Dissertation, University of Pennsylvania, 2006). *Dissertation Abstracts International*, 67(3), 3209982.
- Reynolds, T., Murrill, L. D., & Whitt, G. L. (2006). Learning from organizations: Mobilizing and sustaining teacher change. *The Education Forum*, 70, 123-133.
- Roach, R. & Dervarics, C. (2001). Roderic Paige. *Black Issues In Higher Education*, 19(2), 24-29.
- Slanning, K. (2000). The future school manager: Information and communication technology aspects. *Educational Media International*, 37(4), 243-249.

Senge, P.M. (1990). *The fifth discipline; The art & practice of the learning organization*. New York: Currency Doubleday.

Smith, C. A. (1987). "Mister Reagan's Neighborhood": Rhetoric and national unity. *Southern Speech Communication Journal*, 12(3), 219-239.

Takala, T. (1998). Plato on leadership. *Journal of Business Ethics*, 17(7), 785-798.

Wendt, R. F., & Fairhurst, G. T. (1994). Looking for the "the vision thing": The rhetoric of leadership in the 1992 Presidential election. *Communication Quarterly*, 42(2), 180-195.

Wolvin, A. D. (2005). Listening leadership: Hillary Clinton's listening tour. *International Journal of Listening*, 19(10), 29-38.

As a visual aid used for the purpose of analysis, Tables 1, 2 and 3 pertain to superintendents, school board members' and principals' ranking of various communication methods in the matrices of the author's study.

**Participants' Ranking Matrix—Superintendents**

Level I Ad-min.(3) partici-pantsAll num-bers %	Verbal	Non ver-bal	Actions	Ritual	Storytel-ling	Icons	Sym-bolic	Graphic	Repetiti-on	Novelty	Simplici-ty	Brevity	Metaphor
Very effec-tive	67	33	67	33	67	67			67	33	67	33	33
Somewh-33 effec-tive	33	67	33	67		33	100		33	67	33	33	67
Not very effec-tive					33							33	
Not at all effec-tive													

**Table 4.1**

**Participants' Ranking Matrix—Board Members**

Board Member (9) participants All numbers %	Verbal	Non verbal	Actions	Ritual	Storytelling	Logos	Symbols	Graphics	Repetition	Novelty	Simplicity	Brevity	Metaphor
Very effective	78	56	89	22	33			22	44	11	44	67	56
Somewhat effective	22	44	11	56	56	67	67	44	67	44	44	22	44
Not very effective				22	11	22	11			11	12	11	
Not at all effective						11			12	11			

**Table 4.2**

**Participants' Ranking Matrix—Principals**

Level II Admin. (29) participants All numbers %	Verbal	Non verbal	Actions	Ritual	Storytelling	Logos	Symbols	Graphics	Repetition	Novelty	Simplicity	Brevity	Metaphor
<i>continued on next page</i>													

Very effective	69	55	93	28	28	31	45	76	28	76	52	31
Somewhat effective	31	41	7	62	38	55	52	21	38	21	45	45
Not very effective		4		7	31	7	3	3	28	3	3	10
Not at all effective				3	3	7			6			14

Table 4.3



## Chapter 5

# Ethical and Social Responsibilities

### 5.1 Business ethics in a nutshell: Corporate social responsibility<sup>1</sup>

The legal and historic roots of the modern corporation reach well back into the eighteenth century, but it was in the Industrial Revolution of the nineteenth century that this truly extraordinary form of human organization came into its own and, the twentieth century, became the dominant economic force on earth. Consider its amazing characteristics concentration of management, accumulation of capital, shielding of ownership from liability, and being granted a legal existence not necessarily bounded by either space or time—both ubiquitous and eternal! As well, however, consider its fearsome prospects vis-à-vis its lack of accountability, its deficit of democratic governance, its often-uncivilized competitive engagement with all other sectors of society, not to mention its transcendence of both national sovereignty and legal jurisdiction. And there you have it. Is the Trans-national Corporation the answer to the fundamental issues of human survival, or the fundamental threat to life itself? In short, will the corporation of the twenty-first century be a corrupt Robin Hood, or a virtuous Sheriff of Nottingham?

Corporations are not natural persons. Corporations are fictitious, corporations are juridical persons created by law. The point is this: the ethical considerations one might use when dealing with a friend, associate, or stranger, are significantly different when the subject is the corporation.

Getting this straight is critically important to an adequate understanding of business ethics. People—their behavior and the products of their work and intellect—are judged ethically and legally based chiefly on their intentions. Ethical analysis of the behavior of natural persons begins with considerations of what a person meant by what he or she did, said, or produced. In contrast, ethical analysis involving the entity we call “the corporation” must forever begin and end in law and public policy. With reference to the political economy that brought forth the beast. The legal entity, known as the corporation, was created to shield investors from liabilities beyond the limit of their investment (a result that neither sole proprietorships nor partnerships could accomplish) with the legislative intent of facilitating the aggregation of private capital. This legal experiment begun 19th century has succeeded spectacularly.

For people to survive, they need physical and emotional nourishment, and familial and social support. Corporations survive solely by their ability to return value to their shareholders. Hence, corporations are consequential critters, Utilitarian to the core. A friend may forget a lunch date and hurt your feelings, but when he says, “I’m really sorry, I can’t believe I forgot.” You say, “Hey I missed you, but it’s OK. Let’s try again next week.” When a company launches a new product and if the 100 million dollar venture tanks, shareholders do not want to hear about how sorry management is that things did not work out, or that management meant well. It will do the CEO no good to say, “My heart was in the right place.”

When we talk about the ethical criteria for judging the behavior of corporations we speak not of intent, but responsibility: quite literally, the capacity to respond. Corporate ethics is the ethics of corporate social responsibility (CSR), not corporate personal responsibility. The responsibility of a corporation is shaped by

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<sup>1</sup>This content is available online at <<http://cnx.org/content/m35556/1.4/>>.

two realities: the obligations created by society through (1) law and public policy (legal responsibilities), and (2) the obligations created by corporate culture, i.e. stakeholder (customers, employees, neighborhoods, natural environments) obligations. The two overlap and reinforce each other, but their limits lie within the boundaries of a company's tangible capacities.

Corporate ethics is really about gaining understanding of what are called "mixed motives". When natural persons have mixed motives—you give a hundred bucks to the opera because you want your boss, who supports the opera, to think well of you—we somehow know that this is not an unambiguously laudable act. But when a company that makes computers gives 100 laptops to the public school system, and does so with the hope that exposing children to their brand of computers will lead to increased sales—this "doing good to do well" is not only laudable, it is responsible—responsible both to shareholders and the stakeholders.

Corporations as a matter of fact, can only act with "mixed motives". By law, they are created to serve the bottom line of returning wealth to investors. The law says corporations have a fiduciary responsibility (fiduciary = the highest standard of loyalty and trust owed by agents to principles) to their shareholders, who are the legal owners of the corporation. To do good, a corporation must do well. As a business ethicist, I argue the reverse: to do well, a corporation must do good. People have consciences, and some would say souls; corporations have neither. Corporations are creatures of law and public policy, they are cultural creations; as such, they have unique cultures of their own. Corporate ethics is therefore really about the creation of a culture of responsibility within the corporation.

Dr Lynne Payne of Harvard University has made a major contribution to the understanding of CSR and how it is achieved in her distinction between compliance based organizations and integrity based organizations. In reality, CSR is a product of both compliance (legal and regulatory constraints) and integrity (the internal culture and self regulatory environment). This is underscored by new laws such as Sarbanes-Oxley Act of 2002 and the almost two decade old US Federal Sentencing Guidelines (policy guidelines established in part to determining corporate criminal punishment in US Federal Courts).

*Sarbanes Oxley* is particularly interesting given Payne's compliance/integrity construct, in that it requires both integrity structures (such as a corporate board of ethics, and internal protections for whistleblowers) and increases fines for violation of anti-trust and other federal statutes regulating inter-state corporate behavior. Thus, corporations are creatures of law and policy and are regulated externally. Corporations have no conscience per se, but like any social system can develop a guiding culture, maintained through education and reinforced by the habits and interactions of the people within the corporation.

In a world of over six billion people, there is little alternative to large and complex organizations designed to feed, house, heal, and help meet basic human needs. The multinational corporation is here to stay; the issues of how these behemoths are guided and controlled is far from settled. How the humans who work and manage these organizations maintain their own integrity within the Utilitarian cultures of the multinational corporation is a chapter of history we are only beginning to write.

The Social Contract between society and the multinational corporation today is being radically renegotiated. The cascading collapses of the Dotcoms, the Enron, Worldcom, and Adelphia scandals, and now, the meltdown of capital markets across the globe portends a turbulent future indeed for both the corporation and the business professional. Yet, it is in such times that fundamental changes most often emerge. Those who dare to ride these currents of change will emerge in a new order of political economy.

## 5.2 Business ethics in a nutshell: Management: the meta profession<sup>2</sup>

In 1912 Louis D Brandeis addressed the graduating students of Brown University. Tradition dictated that the graduating class was divided between those receiving learned degrees in the professions of law, medicine and ministry from those in the skill based disciplines, such as business management. The future Supreme Court justice did an interesting thing that graduation day: he turned away from the professional degree candidates toward the business degree candidates, and said:

Each commencement season we are told by the college reports the number of graduates who have selected

<sup>2</sup>This content is available online at <<http://cnx.org/content/m35553/1.4/>>.



the professions as their occupations and the number of those who will enter business. The time has come for abandoning such a classification. Business should be, and to some extent already is, one of the professions.

Brandeis minced no words in defining what professionalism was all about. It was:

*An occupation for which the necessary preliminary training is intellectual in character, involving knowledge and to some extent learning, as distinguished from mere skill; which is pursued largely for others, and not merely for one's own self; and in which the financial return is not the accepted measure of success.*

Spoken to clergy, physicians and lawyers in 1911, these words would have had a familiar—if unheeded—ring. But to businessmen? Brandeis' intuition about the decisive character of business management for human welfare has been borne out across the tortured years of this past century. His argument, however, that business management was essentially professional in character is debated still.

The three characteristics of professionalism cited by Brandeis address detail the nature of the requisite responsibility, and are the crux of why it is still controversial to call business management a profession:

- First. A profession is an occupation for which the necessary preliminary training is intellectual in character, involving knowledge and to some extent learning, as distinguished from mere skill.
- Second. It is an occupation which is pursued largely for others and not merely for one's self.
- Third. It is an occupation in which the amount of financial return is not the accepted measure of success.

Within Brandeis' three paradoxical pronouncements lies the answer to what it means to be a professional in business.

### 5.2.1 The paradox of skill

All professions require unique skills. While demonstrated proficiency in particular skills is necessary for admission into a profession, skill mastery alone is not sufficient to define the professional. If it were, a surgeon would be simply a plumber employed to mend human pipes and valves; a lawyer simply a carpenter crafting together legal words and phrases into motions, wills or contracts; a teacher simply an actor skilled at presentation or lecturing. While the surgeon must be extraordinarily skilled in the crafts of incision and suturing, while the lawyer must be adept at the craft of legal word-smithing, and the teacher a master of the practical arts of communication, such skills are not the essence of who they are as professionals, nor are they the be and end all of their practices. Understanding this difference is the key to the classic distinction between a trade and a profession.

Both trades and professions require the practice and perfection of significant skills, but a trade is completely defined by its commensurate skill; a profession is not. As Brandeis explains: "A profession is an occupation for which the necessary preliminary training is intellectual in character involving knowledge, and to some extent learning, as distinguished from mere skill." I would add that it is not just in "preliminary training" that intelligence and learning are required, but in all aspects of the practice of the continuing professional life.

In a time when everyone wants to be called professional, a real danger lurks in Brandeis' distinction, an elitism ('mere skill'), a snobbery, a class bias that is inappropriate both to the tradesperson and the professional. Once, the trades were a source of enormous pride and distinction. Through Medieval guilds a revolution in human worth and work was set in motion and the foundations of the industrial and technological revolutions laid. Through the guild structure, the skills of trades were passed from generation to generation, and the pride of association with quality and integrity maintained.

But the professions were something else entirely. Called The Learned Professions as the Middle Ages yielded to the Renaissance, the Priesthood, Law, and Medicine obviously required rigorous training in particular skills, but the application of these particular skills required a dimension of commitment and integrity not necessitated of a trade. The wisdom to counsel human beings in the midst of spiritual, emotional, physical or legal crisis necessarily requires more than technique. It requires a learned and practiced wisdom:

an ethic. It is one thing to entrust your bathroom to a plumber, another thing entirely to entrust your life to a heart surgeon. Those willing to assume the unique burdens of the spiritual, physical, and legal care for humans in existential need were designated, or set apart, as learned professionals.

As I write this chapter, I am in the process of recovering from open heart surgery. The experience of putting my life in the hands of a physician is vivid. I am also sitting in my home that is being extensively remodeled. I am fortunate to have a relationship with two excellent persons: Dick, my heart surgeon and Craig, the skilled construction craftsman (carpenter, plumber and electrician) restoring our home. Both are highly skilled and wise men. Dick, however, is integral to the care and counseling that guided me and my family through my decision to “go under the knife”. Craig is full of sage wisdom about the public and foreign affairs of our times, but in no sense is my life vulnerable to his lively and wise insights that we share while he restores my kitchen and replaces the bedroom window.

Exactly three weeks ago Dick, sat on the side of my bed in a Denver, Colorado hospital surrounded by twelve members of my family and talked to me about the alternatives for dealing with a most unexpected heart problem. He showed me the very worrisome pictures of several partially blocked arteries, and told me that, in his opinion, I had no choice but to have quadruple bypass surgery. Dick said he would send my file to anyone I wished for a second opinion, but felt I should reach a decision soon. My kids asked all sorts of nervous and caring questions and he responded openly and fully. Never have I been with someone as obviously open and trustworthy at a time when so much was at stake for me.

As I made my decision to move forward with this personal ordeal, I would learn from friends in the community that Dick was one of the most skilled surgeons in the country. That was reassuring. But I already knew he was a professional: a person wise and caring enough for me to trust my life to.

### 5.2.2 The paradox of the public pledge

A profession is literally so called a profession because the aspirant to the office is orally sworn to specific public commitments—he/she professes publicly legal and ethical obligations unique to the vocation of lawyer, physician, counselor or priest. The public pledge is the portal condition into the unique relationships afforded the vocation. Be clear, it is not primarily a privilege the professional assumes, rather it is fundamentally self-imposed burdens. No one is forced to swear they will put another’s interest above their own, yet this is the condition of all professionalism.

There is a tension between a profession’s public responsibility and its commitment (also made publicly) to the private, vulnerable client. Brandies includes both in the observation that, “A profession is an occupation which is pursued largely for others and not merely for oneself”. The paradox of “the other” is the paradox of the public pledge.

Quite a great deal is made of the special relationship between professionals their parishioners, patients, or clients—the sanctity of the confessional, the doctor patient relationship, or the lawyer client relationship—each special, private and protected both in law and ethics. Thinking of the confessional booth, the examination room, and the lawyer’s office the idea of a uniquely protected privacy, of almost a sacred space, emerges. Assuredly the priest, doctor and lawyer are sworn to hold sacred the disclosures within this zone of professionally protected communication. Being a professional means nothing less than willingly and publicly affirming that the client’s, patient’s or parishioner’s interest shall come before one’s own interests.

For many professionals the matter stops with the pledge: “I swear the patient’s interests comes first, end of discussion.” Yet this commitment to the vulnerable client is only half the issue, as the business and professional crises of our times illustrate. Not only is the priest sworn to care for particular souls, he is also sworn to see to the care of “the people of God”, the moral welfare of the parish, the salvation of the world. Not only is the doctor sworn to put the interest of the patient above his own, but the health of the patient’s family, neighborhood, and the public is also his professional obligation. The lawyer is not simply employed to represent the particular client, but also sworn to be an “officer of the court”. While accountants may be employed by Arthur Anderson to do the books for the Enron Corporation, they also are sworn to keep the interests of the public uncompromised (after all, we call the profession Certified Public Accountants).

I know of no professional comfortable with the tension inherent in this public pledge. No one likes hard choices; no one likes moral ambiguity; each of us wishes to live in a world where things can be reduced to

some least common ethical denominator (for example, a single duty). When teaching business students, the mantra of Milton Friedman is the droning undertone of almost every class discussion: “the business of business is business”, the sole responsibility of the business executive is to increase shareholder return.

Yet, the very essence of professional responsibility is to address the difficult and unavoidable ethical tensions between public and private interest—the priest who hears the confession of a disturbed and homicidal parishioner intent on killing yet again; the lawyer who discovers that a client has misrepresented the facts of his case, and is asking for a plea to the court based in lies and distortions; the doctor who is asked to prescribe extraordinarily expensive treatments to a patient too ill, or old to have any reasonable chance of curative benefit; or the engineer who is told that she is bound by a confidentiality agreement, in spite of her certain conviction that a plane, bridge, or space shuttle is likely to fail and potentially cause extensive loss of life. These are not plot summaries for Hollywood; in an infinite variety, they are the stuff of professional life in the complex world of the twenty-first century.

It is by design, and not by accident, that professionals are thrust continually into such Hobson choice predicaments. The professional’s public pledge is an acceptance of ethical burdens not incumbent on the rest of society. It is an acknowledgment of the reality of human existence where things do not come out even, where real ethical insight must be exercised and where benign outcomes are far from assured. Someone must live in the land between the rock and the hard place, and those who do so are designated “professional”.

I think of professionals as the value bearers for society, those particularly burdened and practiced to address the most difficult and sensitive human ethical dilemmas. I do not mean to imply that a business person, lawyer, doctor, psychiatrist, or teacher is better in some moral sense than anyone else. Instead, that they have agreed to assume a unique ethical burden, to work at the transaction point where issues of significant human value are on the line. The professional is sworn not to desert this post, to be there to counsel, reflect and bear with the human condition in the midst of transition and crisis. This is, to me, the essence of professional practice—the practice of raising the value content of human decisions and choices. That is the professional’s sworn burden, it is the very nature of the ethic that defines who the professional is.

All this said, it astounds me that anyone would want the title of professional. But to make sure this point is underlined, let us consider the “Paradox of pay”, perhaps the most complexing of all to the business professional.

### 5.2.3 The paradox of pay

I am watching a sports show on the evening news. A local sportscaster is interviewing a member of the Harlem Globetrotters, who are in town for a game. The interview goes something like this:

*Sports Guy: Al, I was surprised you never turned pro.*

*Al: What do you mean? I am a pro, I get paid pretty good for playing ball.*

*Sports Guy: Well yeah? But I meant you never tried out for the NBA.*

*Al: Oh, well I like playing for the Globetrotters better ...*

Almost everyone assumes that being professional means getting paid (and paid well) for one’s work. There are professionals and there are amateurs, the former get paid, while the amateurs do it for the love of it. Well, no. Originally, the professions were too important to receive wages in the usual sense. Professionals were not paid for their work; instead, professionals received an honorarium, a gratuity from the community intended both to honor and disassociate the vocation from the necessities of the market, to free the vocation for the selfless task of caring for others.

Three days before my heart surgery I happened to watch a Sixty Minutes piece on a cardiology group in California which was prescribing and performing unnecessary bypass surgery in order to increase their

practice's revenues. It was chilling. I thought of a case we use in business school about how Sears some years ago pressured employees in their auto servicing division to increase revenues by pushing unneeded air filters, mufflers, and break re-linings, etc. But, heart surgeons re-aligning ethical responsibility due to market dependency? I think the Medieval notion of honoraria for professionals may make a lot of sense in this time of triumphant capitalism. There are some values the market is not designed to dictate.

I love to tease business students about the matter of pay and the power of money. I ask, "Considering the 'oldest profession' what had you rather be known for: doing it for money, or doing it for love?" In the realm of love making, most of us prefer to have non market forces determine the dimensions of our intimate lives. Let us hear it for true amateurs!

In a real sense, professionals indeed do it for love. It is difficult to imagine bearing the burden of a physician, lawyer, counselor, or a professor without having a deep and effusive passion for what one does. Professionals cannot leave their work at the office, because what they do is who they are. As I have discovered, teaching is the most rewarding thing I can think of doing. I do not just teach; I am a teacher. I am glad I am paid for my work, but truth be known I would do it for free. I walk away from a class where the students and I have really "lit it up", and I do not even have words to say how good it feels. I can describe historically and intellectually what a professional should be, but even better, I also know what it feels like. No amount of money can compensate for that feeling.

Consider the burdens of true professionalism that skill alone is not sufficient to qualify: one is publicly pledged to work on the unrelenting tension between the welfare of the client and the good of the society; and that is not the criteria by which success will be judged—why would one choose to "turn pro?" I have only one answer: professions are rightly designated as vocations. We become priests, lawyers, physicians, professors because we cannot do anything else; who we are cannot be achieved outside the realm of what we are impelled to do.

### 5.3 Different Approaches to Corporate Governance<sup>3</sup>

-The first link refers to a news story on Dunn's resignation from the Hewlett-Packard board.

It is taken from PBS's Online NewsHour in a report delivered by Margaret Warner on September 22, 2006.

-The second link provides background information on the Hughes Aircraft case profiled just below.

#### CORPORATE PROFILES:

##### **Arthur Andersen**

Once a highly respected company, Arthur Andersen no longer exists having gone bankrupt in the wake of the Enron disaster. Arthur Andersen provided Enron with consulting and accounting services. The consulting division was more successful but the accounting division, with its long tradition of outstanding ethical service, was the corporation's backbone. Arthur Andersen signed off on Enron's use of mark-to-market accounting which allowed Enron to project optimistic earnings from their deals and then report these as actual profits years before they would materialize (if at all). They also signed off on Enron's deceptive use of special purpose entities (SPE) to hide debt by shifting it from one fictional company to another. With Arthur Andersen's blessing, Enron created the illusion of a profitable company to keep stock value high. When investors finally saw through the illusion, stock prices plummeted. To hide their complicity, Arthur Andersen shredded incriminating documents. For federal prosecutors this was the last straw. The Justice Department indicted the once proud accounting firm convinced that this and previous ethical lapses (Sunbeam and Waste Management) showed a pattern of unabated wrongdoing. Arthur Andersen was convicted of obstructing justice on June 15, 2002 and closed its doors shortly after.

McLean and Elkind provided background for this profile on Arthur Andersen. See below for complete reference.

<sup>3</sup>This content is available online at <<http://cnx.org/content/m17367/1.5/>>.

### AA Timeline (Taken from Smartest Guys in the Room)

- 1913–Founded by Arthur Andersen: "think straight, talk straight"
- Stood up to Railroad company in early years. When asked to change accounting standards, Andersen said, "There is not enough money in the city of Chicago [to make AA give into client demands]"
- 1947-1963–Leonard Spacek became president of AA succeeding Arthur Andersen.
- Spacek helped motivate the formation of the Financial Accounting Standards Board. AA also served as conscience of accounting profession criticizing the profession and the SEC (Securities and Exchange Commission) for "failing to square its so-called principles with its professional responsibility to the public."
- 1963-1989–Slow erosion of standards and development of competition between accounting and consulting divisions. (Consulting division was developed to take advantage of a profitable direction in the financial industry.)
- 1989–Consultants achieve relative autonomy as "separate business unit." (McLean: 144)
- 1997–Consultants break from firm.
- 1988-1991–Arthur Andersen receives 54 million in fees from Enron
- 2000–Enron pays AA 52 million. The lion share of this was for consulting fees.
- June 15, 2002–AA found guilty of obstruction of justice. "Today's verdict is wrong....The reality here is that this verdict represents only a technical confiction." (McLean: 406)

### Hughes Aircraft

Howard Hughes founded this company at the beginning of the twentieth century. Hughes became a regular supplier of military hardware to the U.S. military. In the 1980's this included parts for surface to air missiles and fighter aircraft. One division specialized in computer chips designed to convert analogue information to digital for use in guidance systems and decision support systems. For example, these chips interacted with radar to help pilots of fighter aircraft avoid enemy missiles and also served as an essential component for missile guidance systems, the so-called smart bombs. Hughes had won the competitive bids for these highly profitable military projects but they had also committed themselves to tight delivery schedules with inflexible deadlines. And on top of this, the U.S. Airforce demanded that these computer chips and the systems that integrated them be rigorously tested to show that they could withstand the severe environmental stresses of battle. Hughes soon fell behind on the delivery of these computer chips causing a chain reaction of other delays both within the company and between the company and other links in the military supply chain. The environmental tests carried out by quality control under the supervision of Frank Saia had worked hard to complete the time-consuming tests and still remain on schedule with deliveries; hot parts (parts in high demand) were pulled to the front of the testing line to keep things running but soon even this wasn't enough to prevent delays and customer complaints. Giving way to these pressures, some Hughes supervisors pushed employees to pass chips without testing and even to pass chips that had failed tests. Margaret Gooderal and Ruth Ibarra resigned from the company and blew the whistle on these and other ethical failings that had become rampant in Hughes. So the corporate social responsibility question becomes how to change this culture of dishonesty and restore corporate integrity to this once innovative and leading company. (Background information on Hughes can be found at [computingcases.org](http://computingcases.org).)

### Patricia Dunn v. Tom Perkins on Corporate Governance

When Patricia Dunn became a "non-executive" chairman of Hewlett-Packard's board on February 7, 2005, she brought with her an outstanding reputation in corporate governance. Her top priorities were to oversee the election of a new CEO after the firing of Carly Fiorina whose management of the recent acquisition of Compaq had lost her the HP board's support. Dunn also was determined to stop leaks to the press from high-level HP officials. She viewed the latter task as a fundament component of the post-Enron corporate governance approach she felt was needed as Hewlett-Packard moved into the 21st century. But her formal take on CG was at odds with powerful board member and successful venture capitalist, Tom Perkins. In his opinion, too strict an approach to CG stood in the way of HP culture and took focus away from competing with Dell and IBM as well as staying on the cutting edge in the development of new technology. As the leaks continued, Dunn's investigation into their source (most likely a discontented HP board member) became more active and rigorous. And the disagreements between her and board member Perkins deepened; their

incompatible views on CG (and other disagreements) led to Perkins's resignation from the HP board. Things became critical when Perkins received a letter from A.T. and T. informing him that an account had been established in his name (but without his knowledge or consent) using the last 4 digits of his social security number and his private phone number. During the HP-led investigation into the press leaks, a private investigation firm used an illegal technique known as "pretexting" to obtain confidential information about HP board members and news reporters including private phone and social security numbers. Perkins reported this to the SEC, and Patricia Dunn, as chairman and de facto head of the leak investigation, was indicted on four criminal charges including identity theft.

For a complete case study see Stewart (complete reference below) and Anne Lawrence and James Weber, *Business and Society: Stakeholders, Ethics, Public Policy*, 13th edition (McGraw-Hill): 501-513.

Dunn focused on incompatible views of corporate governance as one of the causes of the rift that had developed between her and Perkins's: **"Tom's model of governance may be appropriate in the world of venture capital, but it is outmoded and inappropriate in the world of public company governance."** (Stewart, 165) She also made clear her strong views on board members leaking confidential information shared during board meetings to the press: **"The most fundamental duties of a director—the duties of deliberation and candor—rely entirely upon the absolute trust that each director must have in one another's confidentiality. This is true for trivial as well as important matters, because even trivial information that finds its way from the boardroom to the press corrodes trust among directors. It is even more critical when discussions can affect stock prices....Leaking "good" information is as unacceptable as leaking "bad" information—no one can foretell how such information may advantage or disadvantage one investor relative to another."** (Stewart, 156)

### Questions

How can successful corporate governance programs be integrated into companies with free-wheeling, innovative cultures without dampening creative and imaginative initiatives? How does one make sense of the fundamental irony of this case, that a conscientious pursuit of corporate governance (attacking violations of board confidentiality) can turn into violation of corporate governance (violation of the privacy and persons of innocent board members)?

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### Word Version of this Template

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**Figure 5.1:** This is an example of an embedded link. (Go to "Files" tab to delete this file and replace it with your own files.)

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### 5.3.1 Introduction

James B. Stewart, in a *New Yorker* article about Patricia Dunn and Hewlett-Packard, describes corporate governance as "a term that technically refers to all aspects of running a corporation but in recent years has come to emphasize issues of fairness, transparency, and accountability." This module looks at corporate governance from the macro perspective, (1) examining the management strategies adopted by a firm to ensure compliance and pursue excellence and (2) from the standpoint of government as it seeks to minimize unethical corporate behavior and to maximize the corporation's contribution to social welfare.

## 5.3.2 What you need to know ...

### 5.3.2.1 Prisoner's Dilemma: Cooperation or Competition?

Scholarly debates on corporate governance have turned on the advocacy of different approaches, many of which can be modeled mathematically. Two approaches are based on the concepts of agency and stewardship. (See Davis et. al. in Clarke 2004) To enter into this debate, you will reenact the "Prisoner's Dilemma." Imagine that two patriotic spies, A and B, have just been captured by the enemy. Both are placed in separate interrogation cells and are being pressured to confess and provide details about their spying activities. A and B would like to coordinate their actions but the enemy has kept them apart to prevent this. Their objective is to pit A against B another in order to get the desired information. To do this, they have set forth the following systems of motivations, i.e., punishments and rewards.

#### Options for the Prisoners

- **If both A and B confess.** A and B are put in jail for five years each. The net loss in this scenario is 10. This is the least desirable alternative from the collective standpoint.
- **If one confesses and the other does not.** The confessor is released immediately while the non-confessor gets seven years in prison. This maximizes the confessor's self interest but severely punishes the patriotic, non-confessor. Net loss is 7.
- **If both do not confess.** After six months of half-hearted interrogation (most of this time is for processing the prisoners' release), both are set free for lack of evidence. While not maximizing self interest (this lies in confessing while the other remains silent) this does maximize overall welfare by producing a net loss of only 1.

#### Prisoner Dillema Options Summarized

Prisoner A / Prisoner B	Confess	Not Confess
Confess	Both go to jail for 5 years (Net loss is 10)	A goes to jail for 7 years. B is released. (Net loss is 7)
Not Confess	B goes to jail for 7 years. A is released (Net loss is 7)	Both held for six months, then released. (Net los is 1.0)

Table 5.1

#### Assumptions in the Prisoner Dilemma

- Cooperation produces the best collective option and the second best individual option. This, in turn, assumes that cooperation produces more social welfare than competition.
- Free riding (competing) on the cooperation of others produces the most individual gains (for the free rider) but the second worst collective results. Society suffers loses from the harm done to the trusting, non-confessor and from the overall loss of trust caused by unpunished free-riding.
- Unlimited, pure competition (both prisoners confess) produces the worst collective results and the second worst individual results.
- Multiple iterations of the prisoner's dilemma eventually lead to cooperative behavior. But what causes this? (1) The trust that emerges as the prisoners, through repeated iterations, come to rely on one another? Or (2) the fear of "tit-for-tat" responses, i.e, that free riding on the part of one player will be punished by free riding on the part of the other in future iterations?
- Does the Prisoner's Dilemma assume that each player is a rational, self-interest maximizer? Are the players necessarily selfish in that they will seek to maximize self interest even at the expense of the other players unless rewards and punishments are imposed onto the playing situation from the outside?

The Prisoner's Dilemma is designed to model the reality of corporate governance where the directors/owners of a corporation delegate responsibility for the corporation's operations to managers who are charged with

pursuing, not their own interests, but those of their directors. The problem of corporate governance is how this cooperative arrangement is institutionalized. Can managers be left alone and trusted to pursue the best interests of the corporation? This is implied in stewardship theory. Or is it necessary to design a system of controls to keep the managers from diverting the operations of the corporation toward their exclusive, self-interests? This is the approach taken in agency theory. Modeling this in terms of repeated iterations of the prisoner's dilemma, does cooperation emerge as the most reliable strategy in the long run? Or does it need to be manufactured by introducing a system of incentives such as fear of tit-for-tat strategies? The Prisoner's Dilemma models the central problems of corporate governance by asking whether cooperation naturally emerges between managers and directors or whether it needs to be manufactured through a system of punishments and rewards.

The Prisoner's dilemma is discussed throughout the literature in business ethics. For a novel and insightful discussion in the context of corporate responsibility see Peter A. French, 1995 **Corporate Ethics** from Harcourt Brace College Publishers.

### 5.3.2.2 A Short Footnote on Human Nature

- One important means for classifying different approaches to corporate governance is to reflect on the associated account of human nature. This is a very complex issue but, fortunately, political philosophy provides us with some useful insights.
- Thomas Hobbes in the **Leviathan** presents a comprehensive psychological analysis of human nature based on seventeenth century physics. The focal point of this analysis is the human individual's unlimited pursuit of desire. Without external checks (primarily the threat of punishment imposed by a powerful sovereign) the **State of Nature** (where human individuals pursue self interest without external checks) is identical to a **State of War**. This war of all against all is "**solitary, poore, nasty, brutish, and short.**"
- Hobbes's view has been characterized by C.B. Macpherson as "possessive individualism" which portrays the self as the possessor of its own attributes including the property acquired through its actions. This leads to a view called atomic individualism which is based on the claim that the self has its characteristics and determinate structure prior to and independently of any social interaction.
- Jean-Jacques Rousseau offers a brilliantly original criticism of Hobbes' conception of human nature in his Second Discourse, the **Discourse on the Origin of Inequality**. According to him, Hobbes's characterization of human nature in the State of Nature is actually a description of the human corrupted by society and the acquisition of property. "**The first person who, having enclosed a plot of land, took it into his head to say this is mine and found people simple enough to believe him, was the true founder of civil society. What crimes, wars, murders, what miseries and horrors would the human race have been spared, had someone pulled up the stakes or filled in the ditch and cried out to his fellow men: "Do not listen to this imposter."**" Rousseau argues that before the notion of property, the human's desire to preserve self was balanced by the social feeling of pity brought forth by the suffering of others. Only the unchecked pursuit of property (seen in terms of exclusive possession) would bring the motive of self-interest into conflict with natural pity.
- In opposition to Hobbes's atomic and individualistic self, a group of political philosophers, beginning with Aristotle, see the self as primarily social. Aristotle characterizes the human as a political animal (a being who naturally constructs a social organism called the "polis"). Sandel describes a "thick self" constructed out of familial, social and political content; this content is integrated into the core of the self. Werhane's description of this "social animal" is worth quoting in full: "**In that socialization process, we develop a number of interests, roles, memberships, commitments, and values such that each individual is an historical, cultural, and social product, a pluralistic bundle of overlapping spheres of foci, a thick self or selves....[T]here is no self as precritical, transcendental subject, totally ideal spectator or dispossessed subject.**"
- Thus a series of views of human nature emerge that are instrumental in forming different approaches to corporate governance. Hobbes's atomistic individualism will favor the compliance approach mandated



by agency theory as directors set up external checks to self-serving managers. Rousseau's more nuanced view would require structures to hold the pursuit of self-interest in check while strengthening the equally natural impulses toward socializability and cooperation. The social conception of the self would treat the corporation as an environment where managers, as stewards, recruit employees who will quickly commit to the central corporate values and then develop supporting structures and procedures to help their colleagues find meaningful work while fulfilling social, corporate objectives.

### 5.3.2.3 Approaches to Corporate Governance

Summary Table

(1,1)	Description(1,2)	Theory of Human Nature(1,3)	Owner Role(1,4)	Manager Role(1,5)	Corporate Ethics Focus(1,6)
<b>Agency Theory</b> (2,1)	Managers act as agents of the corporation fulfilling the goals established by the owners / directors(2,2)	Managers are rational, but self-interested beings who must be controlled from the outside(2,3)	Owners are principals, that is, they originate the action and bear primary moral responsibility.(2,4)	Managers are agents, that is, responsible for acting in the interest of the principals who hire them. Faithful agency implies avoiding conflicts of interests and maintaining confidences.(2,5)	Compliance focus uses (1) rule-based codes, (2) systems of monitoring, and (3) punishments and rewards to motivate compliance from outside.(2,6)
<i>continued on next page</i>					

<b>Stockholder Approach</b> (3,1)	Corporation is property of stockholders who dispose of it as they see fit.(3,2)	Stockholders pursue self interest. They are rational (instrumental), economic self-interest maximizers.(3,3)	Owners invest in corporation and seek a return (profit) on their investment.(3,4)	Managers are responsible for ensuring that owners get maximum return on investment.(3,5)	Stockholders direct compliance toward manager control and external conformity to laws.(3,6)
<b>Stakeholder Approach</b> (4,1)	Owners drop out of center focus. Corporation is run for the sake of its stakeholders.(4,2)	Groups have special interests but recognize the need to integrate these. Humans possess capacity for procedural reasoning.(4,3)	Owners drop to one of a group of equal stakeholders. Still advocate their financial interests but not to exclusion of other stakeholders.(4,4)	Managers are meta-stakeholders. They treat stakeholders and stakes equally and integrate these to the fullest extent possible.(4,5)	(4,6)
<b>Stewardship Model</b> (5,1)	Managers act as stewards for absentee owners; oversee the operations of corporation and exercise care over them. Emotion (care) plays an equal role with instrumental rationality.(5,2)	Desire and self interest are balanced out by social motives such as Rousseau's pity and Aristotle's virtues.(5,3)	Owners still set cardinal objectives but they also are responsible for providing managers with a meaningful work environment.(5,4)	Managers are stewards exercising care over the property of the owners in their absence. Stewardship is based on internally generated and self-imposed motives toward care.(5,5)	Value-based: (1) identify and formulate common standards of excellence, (2) develop training programs to foster pursuit of these excellences, and (3) develop support structures to help reduce value "gaps."(5,6)

**Table 5.2:** This table summarizes materials from Introduction: Theories of Governance (Clarke, 1 through 30) and provides a taxonomy of several different approaches to corporate governance.

### Agency Theory

1. In agency theory, the owners/directors set the central objectives of the corporation. Managers, in turn, are responsible for executing these objectives in the corporation's day-to-day operations. Corporate governance consists of designing structures and procedures to control management, i.e., to keep their actions in line with director-established objectives.
2. Managers cannot be trusted to remain faithful agents, i.e., to stay faithful to the interests and goals of the owners/directors. This presupposes a particular view of human nature. Humans are rational, egoists. They have desires and use reason to devise means to realize them. Since one desire can be checked only by another desire, this egoism is potentially without limit. Agency theory assumes that

managers will divert corporate resources to pursue their own selfish ends unless checked by some system of external controls. Thus, another key element of corporate governance under agency theory is to find the most efficient systems of controls to keep manager egoism in check.

3. The owners/directors play the role of principal in agency theory. The principal originates the action and bears primary moral and legal responsibility for it. Most of the time the principal of an action is also its executor. But there are times when the principal lacks the knowledge and skill necessary for executing the objectives he or she originates. In this case, the principal contracts with an agent. The principal authorizes the agent to act on his or her behalf. This requires that the agent remain faithful to the goals and interests of the principal. See Hobbes's *Leviathan*, Chapter 16 for an important historical account of the agent-principal relation.
4. Managers are agents. Their primary responsibility is to serve as faithful executors of the goals and interests of the principals. This requires, first, that, managers are responsible for exercising their professional judgment in a competent way. Managers are also responsible for remaining faithful to the interests of their principals. To do this they must avoid conflicts of interests and maintain confidences (i.e., keep secrets). Agent can also range from being free (unguided by principals) to bound (tightly monitored and controlled by principals).
5. How does ethics enter into corporate governance under agency theory? Primary emphasis is placed on compliance, i.e., enforced conformity to rules that constitute minimum thresholds of acceptable behavior. Compliance approaches develop (1) rule based codes, (2) systems of monitoring to detect violations, and (3) punishments and rewards to deter non-compliance and reward compliance. Trevino and Weaver provide an empirical analysis to the goals achieved through compliance ethics: "[4] the perception that better decisions are made because of the ethics program [5] ethical advice seeking, [6] decreased unethical behavior in the organization...[7] ethical awareness." (Weaver and Trevino, 1999: 333.)

### Stockholder Theory

1. The stockholder approach is quite similar to that set forth in agency theory. The difference is that it views the corporation as the property of its owners (stockholders) who may dispose of it as they see fit. Most of the time this involves using it to receive maximum return on investment.
2. Stockholders are oriented toward self-interest, so stockholder theory, along with agency theory, takes an egoistic/Hobbesian view of human nature. Humans are rational, self-interest maximizers. Owners should expect this from the corporation's managers and employees. They should integrate procedures and controls that channel the corporation and its members in the direction of their (owners) self-interest.
3. The owners invest in the corporation and seek a return (profit) on this investment. But this narrow role has been expanded into overseeing the operations of the corporations and its managers to ensure that the corporation is in compliance with ethical and legal standards set by the government. Just as the master, under tort law, was responsible for injury brought about by the negligence of a servant, so also are directors responsible for harm brought about by their property, the corporation.
4. Managers are role-responsible for ensuring that investors get maximum return on their investment. This includes exercising good business judgment and avoiding conflicts of interests and violations of confidences.
5. Like corporations operating within agency theory, stockholder corporations focus on compliance strategies to monitor managers and make sure they remain faithful agents. However, directors under the stockholder approach also take seriously oversight responsibility which include ensuring corporate compliance with laws such as Sarbanes-Oxley and the Federal Sentencing Guidelines.

### Stakeholder Theory

1. Owners drop out of the center of attention in this approach to become one of several, equal stakeholders. A stakeholder is any group or individual that has a vital interest, right, good, or value in play or at risk. (A gambler's stake is the money on the table in play as the roulette wheel turns. Depending

on the outcome of the situation, the gambler either keeps or loses the stake.) Examples of corporate stakeholders include stockholders, employees, customers, suppliers, local community, and government. The corporation on this view exists for the sake of its stakeholders, not stockholders.

2. The stakeholder view can be closely tied to egoism if it is assumed that the different stakeholder groups exist to maximize their selfish interests. But the stakeholder approach to corporate governance goes beyond the egoistic account of human nature. The corporation (and its managers) become responsible for mediating between these different, often conflicting, stakeholder interests, always keeping in mind that all stakeholders deserve equal respect. If stakeholders have any solidarity with one another, it is because the interest set of each includes the interests of the others. (This is how Feinberg defines solidarity.) The ability to envision the interests of each stakeholder and to work toward integrating these must be built on a view of human nature that is as altruistic as egoistic. While not embracing the social view of human nature outlined above, the stakeholder view assumes that stakeholders are capable and willing to negotiate and bargain with one another. It begins, in other words, with enlightened and long term self interest.
3. The first feature of the owner role is the reduction in centrality mentioned just above. They advocate their interests in the same arena as the other stakeholders, but they also must work to make their interests compatible with the other stakeholders. This requires integrating interests when possible and drawing integrity-preserving compromises when necessary. (See Benjamin 1990).
4. Managers play an important meta-role here. They are faithful agents but of all stakeholders, not just stockholders. Thus, they become referees or (to switch metaphors) brokers between stakeholders. They oversee the generation of expansive corporate values capable of absorbing and integrating narrower stakeholder interests.
5. Stakeholder approaches combine compliance and value-based approaches. In compliance, corporate officers define a moral and legal minimum; this consists of the minimum set of rules necessary for stakeholder coexistence. Beyond this, value-based approaches seek to create common, broader objectives, aspirations that can unite the different stakeholders in the pursuit of excellence. Stakeholder approaches need both; the compliance approach gets things started and the values-based approach sets them on the path to excellence.

### Stewardship Theory

- Managers and employees can be trusted to act as stewards or guardians of the corporation. This means that while they do not own the corporation's resources, they will safeguard these for the owners. A steward is a caretaker who looks after the owner's property and interests when the owner is absent
- This approach definitely makes use of the social approach to human nature. Humans, naturally and spontaneously, realize their innermost natures by forming social unions. The corporation, under this view, is such an organization. While taking on the characteristics of a social contract with the other approaches, especially agency theory, the corporation under the stewardship view is more of a cooperative, collaborative enterprise. Humans can act and find meaning in interests and concerns well beyond the confines of the ego. In fact, to organize the corporation around egoistic assumptions does harm to those capable of action on altruistic motives. The emphasis here is on building trust and social capital to strengthen the social potentialities of human nature.
- Owners still establish the cardinal objectives for the sake of which the corporation exists. But they are also responsible for providing managers with an environment suitable developing human potentialities of forming societies to collaborate in meaningful work.
- Managers act as stewards or caretakers; they act as if they were owners in terms of the care and concern expressed for work rather than merely executors of the interests of others. In other words, the alienation implied in agency theory (acting not out of self but for another), disappears as the managers and employees of the corporation reabsorb the agent function.
- Stewardship approaches are primarily value-based. They (1) identify and formulate common aspirations or values as standards of excellence, (2) develop training programs conducive to the pursuit of excellence, and (3) respond to values "gaps" by providing moral support.

**5.3.2.4 External Controls: Fining, Stock Dilution, Changing Internal Governance, Court Ordered Adverse Publicity, and Community Service**

**Classifications of Corporate Punishments from French and Fisse**

	Description	Example	Target of Punishment	Deterrence Trap Avoided?	Non-financial Values Addressed?	Responsive Adjustment	Interference with Corporate Black Box
<b>Monetary Exaction</b>	Fines	Pentagon Procurement Scandals	Harms innocent	Fails to Escape	Few or None Targeted	None	No interference
<b>Stock Dilution</b>	Dilute Stock and award to victim		Stockholders (Not necessarily guilty)	Escapes by attacking future earnings	Few or None	Limited	No interference
<b>Probation</b>	Court orders internal changes (special board appointments)	SEC Voluntary Disclosure Program	Corporation and its Members	Escapes since it mandates organizational changes	Focuses on management and subgroup values	Passive adjustment since imposed from outside	Substantial entry into and interference with corporate black box
<b>Court Ordered Adverse Publicity</b>	Court orders corporation to publicize crime	English Bread Acts (Hester Prynne shame in <b>Scarlet Letter</b> )	Targets corporate image	Escapes (although adverse publicity indirectly attacks financial values)	Loss of prestige / Corporate shame / Loss of Face/Honor	Active adjustment triggered by shame	No direct interference (corporation motivated to restore itself)
<b>Community Service Orders</b>	Corporation performs services mandated by court	Allied chemical (James River Pollution)	Representative groups/individuals from corporation	Escapes since targets non-financial values	Adds value to community	Passive or no adjustment: sometimes public does recognize that cs is punishment	None

**Table 5.3:** This table summarizes material from Brent Fisse, "Sanctions Against Corporations: The Limitations of fines and the enterprise of Creating Alternatives." This article is found in the book, **Corrigible Corporations and Unruly Law** and provides a taxonomy of different forms of punishment for corporations. It helps rate a corporate punishment in terms of whether it targets the guilty, produces a positive change within the corporation, avoids Coffee's deterrence trap, and minimizes interference in what Stone terms the corporate black box. For full reference to book see bibliography below.

#### Requirements of Sarbanes-Oxley (From Dyrud: 37)

- Provide increased protection for whistle-blowers
- Adhere to an established code of ethics or explain reasons for non-compliance
- Engage in "full, fair, timely and understandable disclosure"
- Maintain "honest and ethical" behavior.
- Report ethics violations promptly
- Comply with "applicable governmental laws, rules, and regulations"
- Dyrud cites: ELT, **Ethics and Code of Conduct**, n.d.; [http://www.elt-inc.com/solution/ethics\\_and\\_code\\_of\\_conduct\\_training\\_obligations.html](http://www.elt-inc.com/solution/ethics_and_code_of_conduct_training_obligations.html)

#### **Ammended Federal Sentencing Guidelines (Dyrud 37)**

- Establishing standards and procedures to prevent and detect criminal conduct
- Promoting responsibility at all levels of the program, together with adequate program resources and authority for its managers
- Exercising due diligence in hiring and assigning personnel to positions with substantial authority
- Communicating standards and procedures, including a specific requirement for training at all levels
- Monitoring, auditing, and non-internal guidance/reporting systems
- Promiting and enforcing of compliance and ethical conduct
- Taking reasonable steps to respond appropriately and prevent further misconduct in detecting a violation

### **5.3.3 What you will do ...**

#### **Module Activities**

- Study the Prisoner's Dilemma to help you formulate the central challenges of corporate governance.
- Study four different approaches to corporate governance, (1) agency theory, (2) the stockholder approach, (3) the stakeholder approach, and (4) stewardship theory.
- Examine corporate governance from the macro level by (1) looking at the structural changes a company can make to comply with legal and ethical standards and (2) examining the balances that government must make to control corporate behavior and yet preserve economic freedom.
- Design a corporate governance program for an actual company that you and your group choose. It should be a company to which you have open access. You will also be required to take steps to gain the consent of this company for your study.
- Reflect on how to integrate this module's macro description of corporate governance with the micro perspective presented in the module on moral ecologies and corporate governance.

#### **Corporate Governance Plans**

- A corporate code of ethics that responds to the specific ethical problems uncovered by your profile of the corporation you are studying.
- A corporate ethics training program designed to acquaint employees, owners, and managers with the company's value aspirations and compliance objectives.
- A Corporate Ethics Audit designed to identify and minimize ethical risks.
- A comprehensive ethics compliance program that responds to the requirements set forth in Sarbanes and Oxley as well as the Federal Sentencing Guidelines.
- A program in corporate excellence designed to articulate and realize the core values that define your company's identity and integrity.

### **5.3.4 What did you learn?**

This material will be added later. Students will be given an opportunity to assess different stages of this module as well as the module as a whole.

### 5.3.5 Appendix

#### Bibliography

1. Benjamin, M. (1990) **Splitting the difference: Compromise and Integrity in Ethics and Politics**. Lawrence, KS: University of Kansas Press.
2. Carol, A. B., "Social Responsibility," in Werhane, P., and Freeman, R. E., eds. (1997, 1998) **Blackwell Encyclopedic Dictionary of Business Ethics**. Oxford, UK: Blackwell Publishers, INC: 593-595.
3. Clarke, T. (2004) "Introduction: Theories of Governance—Reconceptualizing Corporate Governance Theory After the Enron Experience," in **Theories of Corporate Governance: The Philosophical Foundations of Corporate Governance**, ed. Thomas Clarke. New York: Routledge: 1-30.
4. Davis, J.H., Schoorman, D., and Donaldson, L. "Toward a Stewardship Theory of Management," in **Theories of Corporate Governance: The Philosophical Foundations of Corporate Governance**, ed. Thomas Clarke. (2004) New York: Routledge: 1-30.
5. Dyrud, M.A. (2007) "Ethics, Gaming, and Industrial Training," in **IEEE Technology and Society Magazine**. Winter 2007: 36-44.
6. Feinberg, J. (1970) "Collective Responsibility" in **Doing and Deserving: Essays in the Theory of Responsibility**. Princeton, NJ: Princeton University Press: 234.
7. Fisse, B. and French, P.A., eds. (1985) **Corrigible Corporations and Unruly Law**. San Antonio, TX: Trinity University Press.
8. French, P.A. (1984) **Collective and Corporate Responsibility**. New York: Columbia University Press..
9. Hobbes, T. (1651, 1968) **Leviathan**. Middlesex, England: Penguin Books: 186.
10. Macpherson, C.B. (1962) **The Political Theory of Possessive Individualism: Hobbes to Locke**. London, UK: Oxford University Press: 3.
11. May, L. (1987) **The Morality of Groups: Collective Responsibility, Group-Based Harm, and Corporate Rights**. Notre Dame, IN: University of Notre Dame Press.
12. McLean, B., and Elkind, P. (2003) **The Smartest Guys in the Room: The Amazing Rise and Scandalous Fall of Enron**. New York: Portfolio: 141-149.
13. Paine, L.S. (1994) "Managing for Organizational Integrity," in **Harvard Business Review**, March/April 1994.
14. Rousseau, J.J. (1987) **Jean-Jacques Rousseau: The Basic Political Writings** Translated by Donald A. Cress. Indianapolis, IN: Hackett Publishing Company: 60.
15. Sandel, M. (1982, 1998). **Liberalism and the Limits of Justice**. Cambridge: Cambridge University Press
16. Stewart, J.B. (2007) "The Kona Files: How an obsession with leaks brought scandal to Hewlett-Packard," in **The New Yorker**, February 19 and 26, 2007: 152-167.
17. Stone, C. D. (1975) **Where the Law Ends: The Social Control of Corporate Behavior**. Prospect Heights, IL: Waveland Press, INC: 1-30.
18. Swartz, M., Watkins, S. (2003) **Power Failure: The Inside Story of the collapse of Enron**. New York: Doubleday: 356.
19. Weaver, G.R. and Trevino, L.K. (1999) "Integrated and decoupled social performance: Management commitments, external pressures, and corporate ethics practices." **The academy of Management Journal**, 42: 539-552.
20. Werhane, P.H. (1999) **Moral Imagination and Management Decision Making**. Oxford, UK: Oxford University Press: 39.
21. Werhane, P. H. (2008) "Mental Models: Moral Imagination and System Thinking in the Age of Globalization," in **Journal of Business Ethics**, 78: 463-474.
22. Werhane, P. (2007) "Corporate Social Responsibility/Corporate Moral Responsibility: Is There a Difference and the Difference It Makes," in eds., May, S., Cheney, G., and Roper, J., **The Debate over Corporate Social Responsibility**. Oxford, UK: Oxford University Press: 459-474.



## Corporate Governance and Hewlett-Packard Case

[MEDIA OBJECT]<sup>4</sup>

### 5.3.6 EAC ToolKit Project

**5.3.6.1** This module is a **WORK-IN-PROGRESS**; the author(s) may update the content as needed. Others are welcome to use this module or create a new derived module. You can **COLLABORATE** to improve this module by providing suggestions and/or feedback on your experiences with this module.

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**5.3.6.2** Funded by the National Science Foundation: "Collaborative Development of Ethics Across the Curriculum Resources and Sharing of Best Practices," NSF-SES-0551779

## 5.4 Theory Building Activities: "Responsibility and Incident at Morales"<sup>6</sup>

### 5.4.1 Module Introduction

#### 5.4.1.1 Getting Started...

Manuel, plant manager at the Phaust chemical plant in Morales, Mexico, has just died. While he was babysitting the process of manufacturing Phaust's new paint remover (monitoring on site temperature and pressure conditions) an explosion occurred that killed him instantly. The Mexican government has formed an independent commission to investigate this industrial accident.

This commission (headed by your instructor) has ordered key participants to testify on their role in the accident in a public hearing. Your job is to present before this commission from a stakeholder point of view. You will be divided into groups to role play the following stakeholder perspectives:

- Fred, the chief engineer involved in designing the plant,
- plant workers,
- officials from Mexican government regulatory agencies,
- Phaust management,
- representatives from the parent French company,
- officials presiding over an engineering professional society.

You will be assigned roles and given class time to prepare presentations for the commission. Then the class will enact the public hearing by having each group give a presentation from the perspective of its assigned role. Following these presentations, groups will answer questions from the investigating commission. Finally, you will work through debriefing activities to help solidify your practical understanding of the module's chief concepts. Background materials designed to help you with your presentations include sketches of moral responsibility, links to the "Incident at Morales" Case, tasks to help structure your role-playing, and activities to debrief on this exercise. This module is designed to help you learn about moral responsibility by using responsibility frameworks to make day-to-day decisions in a realistic, dynamic, business context.

<sup>4</sup>This media object is a downloadable file. Please view or download it at <CorpGov\_HP\_Case.pptx>

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<sup>6</sup>This content is available online at <<http://cnx.org/content/m15627/1.7/>>.

#### 5.4.1.1.1 Before You Come to Class...

1. Visit the link to the National Institute for Engineering Ethics. Look at the study guide and download the script for the video, "Incident at Morales." You want to have some idea of what happens in the video before you watch it.
2. Read the module. Pay special attention to the section on "What you need to know." Here you will read summaries of three senses of moral responsibility: blame responsibility, sharing responsibility, and responsibility as a virtue. Your goal here is not to understand everything you read but to have a general sense of the nature of moral responsibility, the structure of the responsibility frameworks you will be using in this module, and the difference between moral and legal responsibility. Having this background will get you ready to learn about moral responsibility by actually practicing it.
3. Come to class ready to watch the video and start preparing for your part in the public hearing. It is essential that you attend all four of these classes. Missing out on a class will create a significant gap in your knowledge about and understanding of moral responsibility.

#### 5.4.2 What you need to know...

"Responsibility" is used in several distinct ways that fall under two broad categories, the reactive and the proactive. Reactive uses of responsibility refer back to the past and respond to what has already occurred. (Who can be praised or blamed for what has occurred?) Proactive uses emerge through the effort to extend control over what happens in the future. An important part of extending control, knowledge, and power over the future is learning from the past, especially from past mistakes. But proactive responsibility also moves beyond prevention to bringing about the exemplary. How do occupational and professional specialists uncover and exploit opportunities to realize value in their work? Proactive responsibility (responsibility as a virtue) explores the skills, sensitivities, motives, and attitudes that come together to bring about excellence.

##### 5.4.2.1 Different meanings of Responsibility

###### Reactive Senses

1. **Causal Responsibility** refers to prior events (called causes) which produce or prevent subsequent events (called effects). Cheap, inaccurate sensors (cause) required that Manual be present on the scene (effect) to monitor the high temperatures and pressures required to correctly prepare Phaust's paint stripper.
2. **Role Responsibility** delineates the obligations individuals create when they commit to a social or professional role. When Fred became an engineer he committed to holding paramount the health, safety and welfare of the public. (See NSPE code of ethics)
3. **Capacity Responsibility** sets forth those conditions under which someone can be praised or blamed for their actions. Praise and blame associate an agent with an action. Excuses are based on means for separating or disassociating an agent from their actions. Capacity responsibility helps us determine whether there are any legitimate excuses available for those who would disassociate themselves from untoward, harm-causing actions.
4. **Blame Responsibility** determines when we can legitimately praise or blame individuals for their actions.

###### Proactive Senses

1. **Sharing Responsibility** extends the sphere of responsibility to include those to whom one stands in internal relations or relations of solidarity. Shared responsibility includes answering for the actions of others within one's group. It also includes coming to the moral aid of those within one's group who have gone morally astray; this involves bringing to their attention morally risky actions and standing with them when they are pressured for trying to uphold group values. While sharing responsibility

entails answering for what members of one's group have done, it does not extend to taking the blame for the untoward actions of colleagues. Sharing responsibility does not commit what H.D. Lewis calls the "barbarism of collective responsibility" which consists of blaming and punishing innocent persons for the guilty actions of those with whom they are associated.

2. **Preventive Responsibility:** By using knowledge of the past, one can avoid errors or repeat successes in the future. Peter French calls this the "Principle of Responsive Adjustment." (One adjusts future actions in response to what one has learned from the past.) According to French, responsive adjustment is a moral imperative. If one fails to responsively adjust to avoid the repetition of past untoward results, this loops back into the past and causes a reevaluation of the initial unintentional action. The benefit of the doubt is withdrawn and the individual who fails to responsively adjust is now held responsible for the original past action. This is because the failure to adjust inserts the initial action into a larger context of negligence, bad intentions, recklessness, and carelessness. Failure to responsively adjust triggers a retroactive attribution of blame.
3. **Responsibility as a Virtue:** Here one develops skills, acquires professional knowledge, cultivates sensitivities and emotions, and develops habits of execution that consistently bring about value realization and excellence. One way of getting at responsibility as an excellence is to reinterpret the conditions of imputability of blame responsibility. An agent escapes blame by restricting the scope of role responsibility, claiming ignorance, and citing lack of power and control. In responsibility as a virtue, one goes beyond blame by extending the range of role responsibilities, seeking situation-relevant knowledge, and working to skillfully extending power and control.

#### 5.4.2.2 Blame Responsibility

**To hold Fred responsible for the accident at Morales, we need to...**

1. Specify his role responsibilities and determine whether he carried them out
2. Identify situation-based factors that limited his ability to execute his role responsibilities (These are factors that **compel** our actions or contribute to our **ignorance** of crucial features of the situation.)
3. Determine if there is any moral fault present in the situation. For example, did Fred act on the basis of **wrongful intention** (Did he intend to harm Manuel by sabotaging the plant?), fail to exercise **due care**, exhibit **negligence or recklessness**?
4. If Fred (a) failed to carry out any of his role responsibilities, (b) this failure contributed to the accident, and (c) Fred can offer no morally legitimate excuse to get himself off the hook, then Fred is blameworthy.

Fred, and other Incident at Morales stakeholders, can escape or minimize blame by establishing morally legitimate excuses. The following table associates common excuses with the formal conditions of imputability of blame responsibility. (Conditions of imputability are those conditions that allow us to associate an action with an agent for purposes of moral evaluation.)

Excuse Table

Excuse Source (Capacity Responsibility)	Excuse Statement
Conflicts within a <b>role responsibility</b> and between different role responsibilities	I cannot, at the same time, carry out all my conflicting role responsibilities
<b>Hostile Organizational Environment</b> which routinely subordinates ethical to financial considerations.	The environment in which I work makes it impossible to act responsibly. My supervisor routinely overrules my professional judgment, and I can do nothing about it.
Overly determining situational constraints: financial and time	I lack the time and money to carry out my responsibility.
Overly determining situational constraints: technical and manufacturing	Carrying out my responsibility goes beyond technical or manufacturing limits.
Overly determining situational constraints: personal, social, legal, and political.	Personal, social, legal or political obstacles prevent me from carrying out my responsibilities.
Knowledge Limitations	Crucial facts about the situation were kept from me or could not be uncovered given even a reasonable effort.

Table 5.4

### 5.4.2.3 Proactive Responsibility

#### Preventive Responsibility: Responsive Adjustment

- Responsibility to adjust future actions in response to what has been learned from the past
- **Scenario One:** Past actions that have led to untoward results. Failure here to adjust future actions to avoid repetition of untoward results leads to reassessing the original action and retrospectively blaming the agent.
- **Scenario Two:** Past actions have unintentionally and accidentally led to positive, value-realizing results. Here the agent responsively adjusts by being prepared to take advantage of being lucky. The agent adjusts future actions to repeat past successes. In this way, the agent captures past actions (past luck) and inserts them into the scope of praise.
- **Nota Bene:** The principle of responsible adjustment sets the foundation for responsibility in the sense of prevention of the untoward.

#### Responsibility as a Virtue or Excellence

1. Virtues are excellences of the character which are revealed by our actions, perceptions, beliefs, and attitudes. Along these lines, responsibility as a virtue requires that we reformulate responsibility from its reactive, minimalist sense (where it derives much of its content from legal responsibility) to responsibility as an excellence of character.
2. Aristotle situates virtues as means between extremes of excess and defect. Can you think of examples of too much responsibility? (Does Fred try to take on too much responsibility in certain situations?) Can you think of anyone who exhibits too little responsibility. (Does Fred take on too little responsibility or shift responsibility to others?) For Aristotle, we can have too much or too little of a good thing. From the "too much" we derive vices of excess. from the "too little" we derive the vices of defect.
3. Virtues are more than just modes of reasoning and thinking. They also consist of emotions that clue us into aspects of the situation before us that are morally salient and, therefore, worthy of our notice and response. Two emotions important for responsibility are care and compassion. Care clues us into

aspects of our situation that could harm those who depend on our actions and vigilance. Do Wally and Fred pay sufficient attention to the early batch leakages in the Morales plant? If not, does this stem from a lack of care ("Let operations handle it") and a lack of compassion ("Manuel can take care of himself")? Care and compassion help to sensitize us to what is morally salient in the situation at hand. They also motivate us to act responsibly on the basis of this sensitivity.

4. Responsibility as a virtue manifests itself in a willingness to pick up where others have left off. After the Bhopal disaster, a worker was asked why, when he saw a cut-off valve open, he didn't immediately close it as safety procedures required. His response was that shutting off the valve was not a part of his job but, instead, the job of those working the next shift. This restriction of responsibility to what is one's job creates responsibility gaps through which accidents and other harms rise to the surface. The worker's lack of action may not constitute moral fault but it surely signifies lack of responsibility as a virtue because it indicates a deficiency of care and compassion. Those who practice responsibility as a virtue or excellence move quickly to fill responsibility gaps left by others even if these tasks are not a part of their own role responsibilities strictly defined. Escaping blame requires narrowing the range of one's role responsibilities while practicing responsibility as a virtue often requires effectively expanding it.
5. Finally, responsibility as an excellence requires extending the range of knowledge and control that one exercises in a situation. Preventing accidents requires collecting knowledge about a system even after it has left the design and manufacturing stages and entered its operational life. Responsibility requires that we search out and correct conditions that could, under the right circumstances, produce harmful accidents. Moreover, responsibility is a function of power and control. Extending these and directing them toward good results are clear signs of responsibility as a virtue.

### Responsibility as Virtue

- The Incident at Morales provides us with a look into a fictionalized disaster. But, if it is examined more carefully, it also shows opportunities for the exercise of responsibility as a virtue. The following table will help you to identify these "responsibility opportunities" and allow you to imagine counterfactuals where had individuals acted otherwise the "incident" could have been avoided and moral value could have been realized.
- Think of virtuous or even heroic interventions that could have prevented the accident. These represents, from the standpoint of the film, lost opportunities for realizing responsibility and other virtues.

#### Responsibility as a Virtue: Recovering Lost Opportunities

Characteristic	Relevance to Incident at Morales
Change goal from avoiding blame to pursuing professional excellence.	Could this have led participants to look for more creative responses to EPA environmental regulations?
Develop a flexible conception of your role responsibilities and move quickly to extend it to fill responsibility gaps left by others.	Could this have structured differently the relation between those responsible for plant design/construction and those responsible for its operation?
<i>continued on next page</i>	

Extend the scope and depth of your situational knowledge, especially regarding accumulating information on the operational history of newly implemented technologies.	Would this have led to further follow-up on the early signs of leakage of the couplings?
Extend control and power. This includes finding ways of more effectively communicating and advocating ethical and professional standards in the context of group-based decision-making.	Could Fred have handled more proactively the last minute change in the chemical formulation of the paint remover?

Table 5.5

### Section Conclusion

Integrate the retroactive and proactive senses of responsibility into your group's presentation for the public hearing. Don't just work on the reactive approach, i.e., try to avoid blame and cast it on the other stakeholder groups. Think proactively on how to prevent future problems, respond to this accident, and turn the events into positive opportunities to realize value.

### Questions to Get Started

- Is Fred (blame) responsible for the accident and even Manuel's death? (Use the conditions of imputability and the excuse table to get started on this question.)
- Did Wally and Chuck evade their responsibility by delegating key problems and decisions to those, like plant manager Manuel, in charge of operations? (Start the answer to this question by determining the different role responsibilities of the stakeholders in this situation.)
- What kind of responsibility does the parent French company bear for shifting funds away from Phaust's new plant to finance further acquisitions and mergers? (Looking at the modules on corporate social responsibility and corporate governance will help you to frame this in terms of corporate responsibility.)
- Do engineering professional societies share responsibility with Fred? (The CIAPR and NSPE codes of ethics will help here. Try benchmarking corporate codes of ethics to see if they provide anything relevant.)
- Look at the positive, proactive moral responsibilities of professional societies. What can they do to provide moral support for engineers facing problems similar to those Fred faces? Think less in terms of blame and more in terms of prevention and value realization.

### 5.4.3 Presentation on Moral Responsibility

[MEDIA OBJECT]<sup>7</sup>

### 5.4.4 What you are going to do...

In this module, you will...

1. apply and integrate the concept of moral responsibility (blame responsibility, sharing responsibility, responsibility as a virtue) to situations that arise in the video, "Incident at Morales."
2. learn the basic facts, character profiles, and decision-situations portrayed in the video, "Incident at Morales." You will see the video in class and examine the script and Study Guide at the NIEE website.
3. work in groups to develop and play a stakeholder role in a fictional public hearing. Your group's specific tasks are outlined below in one of the group profiles provided. In general, you will prepare a statement advancing your group's interests and points of view. The responsibility frameworks will help you anticipate questions, prepare responses, and defend your role against those in other roles who

<sup>7</sup>This media object is a downloadable file. Please view or download it at  
<Moral Responsibility.pptx>

may try to shift the blame your way. But most important, this module provides tools to help you go beyond the reactive, blame standpoint.

4. participate in a mock public hearing by playing out your group's assigned role.
5. work with the other groups to debrief on this activity. The public hearing will generate a lot of information, ideas, and positions. Debriefing will help you to structure and summarize this material. The objective here is to learn by doing. But to truly learn from what you have done, you need to reflect carefully.

#### 5.4.4.1 Stakeholder Roles

##### Mexican Government Regulatory Agencies

- Look at OSHA regulations on safety. Do any of these apply to the incident at morales. Pay particular attention to responsibilities for providing safe working conditions and to mandated procedures for accident prevention. How as a government agency can you encourage companies to take active and positive measures to increase workplace safety and prevent accidents?
- Look at EPA or JCA for ideas on environmental issues. What are Phaust's responsibilities regarding local environmental conditions? (Should the Mexican government require lining waste water ponds?)
- As an official representing Mexican government regulatory agencies, how do you balance the safety and environmental needs of Mexican citizens and workers with the need to attract foreign companies and investors to Mexico to promote economic development. Should safety and environmental values ever be traded off to promote economic development?

##### Workers at Morales Plant

- Manuel, your plant manager, has just died. You and your co-workers are concerned about the safety of this new plant. Can you think of any other issues that may be of concern here?
- Develop a statement that summarizes your interests, concerns, and rights. Are these being addressed by those at Phaust and the parent company in France?
- The Mexican Commission established to investigate this "incident" will ask you questions to help determine what cause it and who is to blame. What do you think some of these questions will be? How should you respond to them? Who do you think is to blame for the incident and what should be done in response?

##### Designing Engineer: Fred

- Examine Fred's actions and participation from the standpoint of the three responsibility frameworks mentioned above.
- Develop a two minute position paper summarizing Fred's interests, concerns, and rights.
- Anticipate questions that the Commission might raise about Fred's position and develop proactive and effective responses..
- Be sure to use the three responsibility frameworks. Is Fred to blame for what happened? In what way? What can professional societies do to provide moral support to members in difficult situations? How can interested parties provide moral support? Finally, what opportunities arose in the video practicing moral responsibility as a virtue? (Think about what an exemplary engineer would have done differently.)

##### Phaust Management: Wally and Chuck

- Chuck and Wally made several decisions repounding to the parent company's budget cuts that placed Fred under tight constraints. Identify these decisions, determine whether there were viable alternatives, and decide whether to justify, excuse, or explain your decisions.
- Develop a two minute position paper that you will present to the commission.

- Anticipate Commission questions into your responsibility and develop effective responses to possible attempts by other groups to shift the blame your way.

### Corporate Governance: French Parent Company

- You represent the French owners who have recently required Phaust Chemical. You have recently shifted funds from Phaust operations to finance further mergers and acquisitions for your company.
- What are your supervisory responsibilities in relation to Phaust?
- Develop a preliminary two minute presentation summarizing your position and interests.
- Anticipate likely commission questions along with possible attempts by other groups to shift the blame your way.

### Engineering Professional Society

- You represent the professional engineering society to which Fred belongs.
- Develop a two minute presentation that outlines your group's interests and position.
- Anticipate possible Commission questions, develop responses, and anticipate attempts by other groups to shift the blame your way.
- Respond to whether your professional society should extend moral support to engineers in difficult positions like Fred's. Should they clarify code provisions? Provide legal support and counseling? Make available a professional/ethical support hotline?

### Investigative Commission

This role will be played by your instructor and other "guests" to the classroom. Try to anticipate the commissions questions. These will be based on the conditions of blame responsibility, the principle of responsive adjustment, and responsibility as a virtue.

#### 5.4.4.2 Module Time Line

- Module Preparation Activities: Read module and visit [niee.org](http://niee.org) to get general orientation to "Incident at Morales"
- **Class One:** Watch Video. Receive group role. Begin preparing your group role.
- **Class Two:** Work within your group on preparing your group's statement, anticipating questions, and developing responses.
- **Class Three:** Participate in the Public Hearing. The group representing the Mexican Commission will convene the public hearing, listen to the group's statements, ask questions, and prepare a brief presentation on the Commission's findings
- **Class four:** Class will debrief on the previous class's public hearing. This will begin with the Commission's findings

### 5.4.5 Incident at Morales and Jeopardy

#### Jeopardy and Incident at Morales

[MEDIA OBJECT]<sup>8</sup>

#### Jeopardy on Socio-Technical Systems in Incident at Morales

[MEDIA OBJECT]<sup>9</sup>

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<sup>8</sup>This media object is a downloadable file. Please view or download it at <Jeopardy\_IM.pptx>

<sup>9</sup>This media object is a downloadable file. Please view or download it at <Jeopardy\_SOV\_IM.pptx>



### 5.4.6 What have you learned?

**Listen to the findings of the Mexican Government Commission. Write a short essay responding to the following questions. Be prepared to read parts of your essay to your professor and to your classmates.**

1. Do you agree with the Commissions findings? Why or why not? Be sure to frame your arguments in terms of the responsibility frameworks provided above.
2. Were there any opportunities to offer Fred moral support by those who shared responsibility with him? What were these opportunities. How, in general, can professional societies support their members when they find themselves in ethically difficult situations?
3. What opportunities arise for exercising responsibility as an excellence? Which were taken advantage of? Which were lost?
4. Finally, quickly list themes and issues that were left out of the public hearing that should have been included?

### References

1. F. H. Bradley (1962) *Ethical Studies, Essay I*. Oxford, UK: Oxford University Press.
2. Herbert Fingarette. (1967) *On Responsibility*. New York: Basic Books, INC: 3-16.
3. Larry May (1992) *Sharing Responsibility*. Chicago: University of Chicago Press.
4. Larry May (1996) *The Socially Responsive Self: Social Theory and Professional Ethics*. Chicago: University of Chicago Press: 28-46.
5. Michael Pritchard (2006) *Professional Integrity: Thinking Ethically*. Lawrence,KS: University of Kansas Press.
6. Lawrence Blum (1994) *Moral Perception and Particularity*. Cambridge, UK: Cambridge University Press: 30-61
7. Aristotle. *Nicomachean Ethics, Book 3, Chapters 1-3*.
8. Edmund L. Pincoffs (1986) *Quandaries and Virtues: Against Reductivism in Ethics*. Lawrence, KS: University of Kansas Press.
9. W.H. Walsh (1970) "Pride, Shame and Responsibility," *The Philosophical Quarterly*, Vol 20, no 78, January 1970: 1-13.
10. Albert Flores and Deborah G. Johnson (1983) "Collective Responsibility and Professional Roles" in *Ethics* April 1983: 537-545.



## Chapter 6

# Subject Matter Expert in Different Fields

### 6.1 Operations management: Special topic: supply chain management<sup>1</sup>

Supply chain management is the business function that coordinates and manages all the activities of the supply chain, including suppliers of raw materials, components and services, transportation providers, internal departments, and information systems. Exhibit 6.1 illustrates a supply chain for providing packaged milk to consumers.

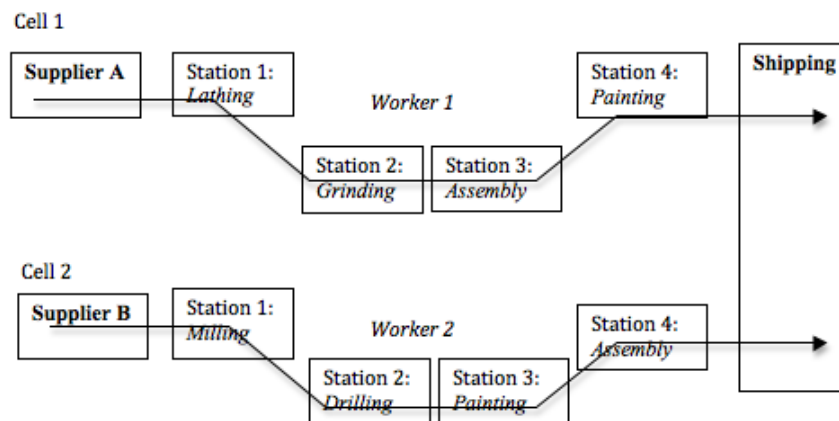


Exhibit 6.1: Illustration of a supply chain

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In the manufacturing sector, supply chain management addresses the movement of goods through the supply chain from the supplier to the manufacturer, to wholesalers or warehouse distribution centers, to retailers and finally to the consumer. For example, Apple, Inc uses sophisticated information systems to

<sup>1</sup>This content is available online at <<http://cnx.org/content/m35461/1.4/>>.

accept orders for custom-built computers from individual customers all over the world. Apple assembles the computers in Shanghai, China, to the customers' specifications. It uses parts and components that are provided by outside suppliers who can deliver the right parts in the right quantity in a timely way to satisfy the immediate production schedule. The completed computers are flown from Shanghai by FedEx, reaching the end-user customers only a few days after the orders were placed. Apple's supply chain allows it to provide fast delivery of high-quality custom computers at competitive prices.

Supply chain concepts also apply to the service sector, where service firms must coordinate equipment, materials, and human resources to provide services to their customers in a timely manner. For example, a retail store that sells electronic products may contract with an outside business to provide installation services to its customers. In many cases, the customer does not even know the installation was done by an outside contractor. Information and communication technologies such as global positioning systems (GPS), barcode technology, customer relationship management (CRM) databases, and the Internet allow service businesses to coordinate external and internal service suppliers to efficiently and effectively respond to customer demand.

The supply chain is not just a one way process that runs from raw materials to the end customer. Although goods tend to flow this way, important data such as forecasts, inventory status, shipping schedules, and sales data are examples of information that is constantly being conveyed to different links in the supply chain. Money also tends to flow "upstream" in the supply chain so goods and service providers can be paid.

### 6.1.1 Bullwhip effect

A major goal in supply chain management strategy is to minimize the bullwhip effect. The bullwhip effect occurs when inaccurate or distorted information is passed on through the links in the supply chain. As the bad information gets passed from one party to the next, the distortions worsen and cause poor ordering decisions by upstream parties in the supply chain that have little apparent link to the final end-item product demand. As information gets farther from the end customer, the worse the quality of information gets as the supply chain members base their guesses on the bad guesses of their partners. The results are wasteful inventory investments, poor customer service, inefficient distribution, misused manufacturing capacity, and lost revenues for all parties in the supply chain.

For example, Open Range Jeans (a fictitious company) are sold in a popular retail store chain. The retail chain decides to promote Open Range Jeans and reduce the price to boost customer traffic in its stores, but the chain does not tell the Open Range manufacturer of this promotion plan. The manufacturer sees an increase in retail orders, forecasts a long-term growth in demand for its jeans, and places orders with its suppliers for more fabric, zippers, and dye.

Suppliers of fabric, zippers and dye see the increase in orders from the jeans manufacturer and boost their orders for raw cotton, chemicals, etc. Meanwhile, the retail chain has ended its Open Range promotion, and sales of the jeans plummet below normal levels because customers have stocked up to take advantage of the promotion prices. Just as end-customer demand falls, new jeans are being manufactured, and raw materials are being sent to the jeans factory. When the falling end-customer demand is finally realized, manufacturers rush to slash production, cancel orders, and discount inventories.

Not wanting to get burned twice, manufacturers wait until finished goods jean inventories are drawn down to minimal levels. When seasonal demand increases jeans purchases, the retail stores order more Open Range jeans, but the manufacturers cannot respond quickly enough. A stockout occurs at the retail store level just as customers are purchasing jeans during the back-to-school sales season. Retail customers respond to the stockout by purchasing the jeans of a major competitor, causing long-term damage to Open Range's market share.

#### 6.1.1.1 Causes of the bullwhip effect

The bullwhip effect is caused by demand forecast updating, order batching, price fluctuation, and rationing and gaming.

- **Demand forecast updating** is done individually by all members of a supply chain. Each member updates its own demand forecast based on orders received from its “downstream” customer. The more members in the chain, the less these forecast updates reflect actual end-customer demand.
- **Order batching** occurs when each member takes order quantities it receives from its downstream customer and rounds up or down to suit production constraints such as equipment setup times or truckload quantities. The more members who conduct such rounding of order quantities, the more distortion occurs of the original quantities that were demanded.
- **Price fluctuations** due to inflationary factors, quantity discounts, or sales tend to encourage customers to buy larger quantities than they require. This behavior tends to add variability to quantities ordered and uncertainty to forecasts.
- **Rationing and gaming** is when a seller attempts to limit order quantities by delivering only a percentage of the order placed by the buyer. The buyer, knowing that the seller is delivering only a fraction of the order placed, attempts to “game” the system by making an upward adjustment to the order quantity. Rationing and gaming create distortions in the ordering information that is being received by the supply chain.

#### 6.1.1.2 Counteracting the bullwhip effect

To improve the responsiveness, accuracy, and efficiency of the supply chain, a number of actions must be taken to combat the bullwhip effect:

- Make real-time end-item demand information available to all members of the supply chain. Information technologies such as electronic data interchange (EDI), bar codes, and scanning equipment can assist in providing all supply chain members with accurate and current demand information.
- Eliminate order batching by driving down the costs of placing orders, by reducing setup costs to make an ordered item, and by locating supply chain members closer to one another to ease transportation restrictions.
- Stabilize prices by replacing sales and discounts with consistent “every-day low prices” at the consumer stage and uniform wholesale pricing at upstream stages. Such actions remove price as a variable in determining order quantities.
- Discourage gaming in rationing situations by using past sales records to determine the quantities that will be delivered to customers.

#### 6.1.2 Other factors affecting supply chain management

In addition to managing the bullwhip effect, supply chain managers must also contend with a variety of factors that pose on-going challenges:

- Increased demands from customers for better performance on cost, quality, delivery, and flexibility. Customers are better informed and have a broader array of options for how they conduct business. This puts added pressure on supply chain managers to continually improve performance.
- Globalization imposes challenges such as greater geographic dispersion among supply chain members. Greater distances create longer lead times and higher transportation costs. Cultural differences, time zones, and exchange rates make communication and decision-making more difficult. Boeing and Airbus have discovered the downside of sourcing from global suppliers. Much smaller suppliers of kitchen galleys, lavatories, and passenger seats have been unable to fulfill orders from Boeing and Airbus, leaving the latter unable to deliver planes to its airline customers.
- Government regulations, tariffs, and environmental rules provide challenges as well. For example, many countries require that products have a minimum percentage of local content. Being environmentally responsible by minimizing waste, properly disposing of dangerous chemicals, and using recyclable materials is rapidly becoming a requirement for doing business.

### 6.1.3 Supplier selection

Choosing suppliers is one of the most important decisions made by a company. The efficiency and value a supplier provides to an organization is reflected in the end product the organization produces. The supplier must not only provide goods and services that are consistent with the company's mission, it must also provide good value. The three most important factors in choosing a supplier are price, quality, and on-time delivery.

A company must not only choose who it wants as a supplier, it must also decide how many suppliers to use for a given good or service. There are advantages to using multiple suppliers and there are advantages to using one supplier. Whether to single-source or multiple-source often depends on the supply chain structure of the company and the character of the goods or services it produces.

If a company uses a single supplier, it can form a partnership with that supplier. A partnership is a long-term relationship between a supplier and a company that involves trust, information sharing, and financial benefits for both parties. When both parties benefit from a partnership, it is called a "win-win situation". It is easy to see how choosing suppliers is one of the most important decisions a company makes.

There are advantages and disadvantages to using one supplier. One advantage is that the supplier might own patents or processes and be the only source for the product. With one supplier, pricing discounts may be granted because purchases over the long-term are large and unit production costs for the supplier are lower. The supplier may be more responsive if you are the only purchaser of an item, resulting in better supplier relations. Just-in-time ordering is easier to implement, and deliveries may be scheduled more easily. Finally, using a single supplier is necessary to form a partnership. One disadvantage is that if that one supplier experiences a disaster at its warehouse like a fire or a tornado, or its workers go on strike, there is no other ready source for the product. Another possible disadvantage is that a single supplier may not be able to supply a very large quantity if it is suddenly needed. Also, sometimes the government requires the use of multiple suppliers for government projects.

There are also advantages and disadvantages to using multiple suppliers. Suppliers might provide better products and services over time if they know they are competing with other suppliers. Also, if a disaster happens at one supplier's warehouse, other suppliers can make up the loss. If a company uses multiple suppliers, there is more flexibility of volume to match demand fluctuations. One disadvantage with multiple suppliers is that it is more difficult to forge long-term partnerships. Information sharing becomes riskier, lower volumes for each supplier provide fewer opportunities for cost savings, and suppliers tend to be less responsive to emergency situations.

Partnerships are long-term relationships between a supplier and a company that involve trust and sharing and result in benefits for both parties. A good example of a partnership is the partnering between a Deere & Co. farm equipment factory and its suppliers. Deere decided to outsource its sheet metal, bar stock, and castings part families.

When Deere sent requests for bids to 120 companies, 24 companies responded to say they were interested. Deere then sent a team of engineers, quality specialists, and supply chain managers to evaluate each company. One supplier was chosen for each of the three part families. All three of the suppliers that were chosen were located less than two hours of driving time from the Deere plant.

For many years, all three suppliers have continued to provide outstanding quality, delivery, and cost performance to Deere. The suppliers benefited by gaining a long-term customer with a large amount of profitable business. Deere realized a 50 per cent drop in production costs on the three part families and was able to better focus on its mission of manufacturing farm equipment.

### 6.1.4 Conclusion

Supply chain management concerns the development of communication and information systems to link suppliers together in cooperative partnerships that promote advantage for all participants. Benefits include faster response times, reduced inventory costs, increased accuracy, and improved quality.

## 6.2 Operations management: Special topic: Total Quality Management<sup>2</sup>

Total Quality Management (TQM) is the organization-wide management of quality that includes facilities, equipment, labor, suppliers, customers, policies, and procedures. TQM promotes the view that quality improvement never ends, quality provides a strategic advantage to the organization, and zero defects is the quality goal that will minimize total quality costs. While this special topic on TQM is not a comprehensive discussion of all aspects of TQM, several key concepts will be discussed.

### 6.2.1 Quality costs

An important basis for justifying TQM practice is understanding its impact on total quality costs. TQM is rooted in the belief that preventing defects is cheaper than dealing with the costs of quality failures. In other words, total quality costs are minimized when managers strive to reach zero defects in the organization. The four major types of quality costs are prevention, appraisal, internal failure, and external failure.

**Prevention costs** are the costs created from the effort to reduce poor quality. Examples are designing the products so that they will be durable, training employees so they do a good job, certifying suppliers to ensure that suppliers provide quality in products and services, conducting preventive maintenance on equipment, and documenting quality procedures and improvements. In a traditional organization that does not practice TQM, prevention costs typically comprise the smallest percentage of total quality costs.

A good example of good product design occurs in all Honda products. Honda produces a wide variety of items including automobiles, ATVs, engines, generators, motorcycles, outboard motors, snow blowers, lawn and garden equipment, and even more items. To say the least, Honda engines last a long time. For example, Honda Accords typically run for well over 200,000 miles.

Employee training is also a very important prevention cost. For instance, employees in a vegetable/fruit packaging warehouse need to know what a bad vegetable/fruit looks like, since customers will not want to find spoiled produce in the store. Lifeguards at a swimming pool must know proper procedures for keeping swimmers safe. In many circumstances in both manufacturing and service businesses, the training of employees can make an enormous difference in preventing defects.

Supplier selection and certification are critical prevention activities. A product or service is only as good as the suppliers who partner with an organization to provide the raw materials, parts and components, and supporting services that make up the final products and services that the end customers receive. For example, a home furnishings store might use an outside subcontractor to install carpeting, but if the subcontractor fails to show up on time, tracks mud into the customer's home, or behaves in a rude manner, the store's reputation will suffer. Similarly, a car manufacturer who purchases defective tires from a supplier risks incurring high costs of recalls and lawsuits when the defects are discovered.

Preventive maintenance is necessary for preventing equipment breakdowns. Many manufacturing companies use sophisticated software to track machine usage, and determine optimal schedules for regular machine maintenance, overhauls, and replacement.

Documenting quality is a necessary prevention cost because it helps the organization track quality performance, identify quality problems, collect data, and specify procedures that contribute to the pursuit of zero defects. Documentation is important to communicating good quality practice to all employees and suppliers.

**Appraisal costs** are a second major type of quality cost. Appraisal costs include the inspection and testing of raw materials, work-in-process, and finished goods. In addition, quality audits, sampling, and statistical process control also fall under the umbrella of appraisal costs.

Inspection and testing of raw materials is very important, since substandard raw materials lead to substandard products. Raw materials used for a bridge determine the strength of the bridge. For example, soft steel will erode away faster than hardened steel. Moreover, the concrete bridge decking needs to be solid, as concrete with air pockets will erode and crumble faster creating an unsafe bridge.

<sup>2</sup>This content is available online at <<http://cnx.org/content/m35447/1.4/>>.

Finished goods and work-in-process inventory also need inspecting and testing. For example, worker error is quite common in the home construction industry, and this is why inspections occur frequently on newly constructed homes during and after the construction process is complete. Building inspectors ensure that the house has the proper framing, electrical, plumbing, heating, and so forth.

Quality audits and sampling are also important appraisal costs. Quality audits are checks of quality procedures to ensure that employees and suppliers are following proper quality practices. With sampling, a company can ensure with confidence that a batch of products is fit for use. For example, a wooden baseball bat manufacturer may test 10 out of every 100 bats to check that they meet strength standards. One weak bat can signal that quality problems are present.

Statistical process control (SPC) is the final type of appraisal cost. SPC tracks on-going processes in manufacturing or service environments to make sure that they are producing the desired performance. For example, a restaurant might statistically track customer survey results to make sure that customer satisfaction is maintained over time. In manufacturing windshields for automobiles, SPC might be used to track the number of microscopic air bubbles in the glass to make sure the process is performing to standard.

**Internal failure costs** are a third category of quality costs. This cost occurs when quality defects are discovered before they reach the customer. Examples of internal failure costs include scrapping a product, reworking the product, and lost productivity due to machine breakdowns or labor errors. Internal failure costs are typically more expensive than both prevention and appraisal costs because a great deal of material and labor often has been invested prior to the discovery of the defect. If a book publisher prints 10,000 books, then discovers that one of the chapters is missing from every copy, the cost of reworking or scrapping the books represents a major loss to the company. It would have been much cheaper to have procedures in place to prevent such a mistake from happening in the first place.

In the case of internal failure cost due to machine failures, FedEx, and other courier services cannot keep up with demand when a conveyor belt breaks down in the package distribution center. Major delays and costs occur when such incidents occur. Other examples include a road construction company having a road grader break down, a tool and die shop having a CNC machine break down, and a farmer having a combine break down during harvest time.

**External failure costs** are the fourth major cost of quality. External failure costs when the defect is discovered after it has reached the customer. This is the most expensive category of quality costs. Examples include product returns, repairs, warranty claims, lost reputation, and lost business. One spectacular example of external failure cost was when the Hubbell telescope was launched into space with mirrors that were ground improperly. When the telescope was turned on, instead of a magnificent view of stars, planets, and galaxies, the scientists could see only blurred images. The price of correcting the problem was over USD 1 billion.

External failure costs also occur when the wrong meal is delivered to a restaurant customer, when a computer breaks down shortly after it was purchased, when the wrong kidney is removed from a patient, and when a poorly designed automobile causes the death of drivers and passengers. Because of the enormous costs of internal and external failures, all companies should strive for zero defects. Successful TQM practice dictates that pursuing zero defects will result in the minimization of total quality costs by spending more on prevention and appraisal activities in order to reduce the much higher costs of internal and external failure.

### 6.2.2 TQM's seven basic elements

Successful practice of Total Quality Management involves both technical and people aspects that cover the entire organization and extend to relationships with suppliers and customers. Seven basic elements capture the essence of the TQM philosophy: customer focus, continuous improvement, employee empowerment, quality tools, product design, process management, and supplier quality.

- **Customer focus:** Decisions of how to organize resources to best serve customers starts with a clear understanding of customer needs and the measurement of customer satisfaction. For example, the Red Cross surveys its blood donors to determine how it can make the blood donation experience more pleasant and convenient. It collects information on the place, date and time donors came in, and asks donors questions of whether the donation time was convenient, whether they were treated



with respect and gratitude, how long they had to wait to donate, and whether parking was adequate. By understanding donors' needs and experiences, Red Cross managers can determine strengths and weaknesses of the donation service process and make adjustments if necessary.

- **Continuous improvement:** An organizational culture that promotes continuous learning and problem solving is essential in the pursuit of zero defects. The Toyota Production System (TPS) is a universal continuous improvement system that has been effectively applied to many different types of organizations, including the health care industry. Essential elements of the TPS culture include studying process flow, collecting data, driving out wasteful non-value-added activities, and making everyone responsible for quality improvement. In the case of health care, the TPS approach enabled one hospital to analyze the causes of patient infections from catheters and pneumonia in patients on ventilators. With simple changes in procedures that prevented patients from getting these secondary illnesses, the hospital was able to save USD 40,000 per patient in these cases.
- **Employee involvement:** Employees in a TQM environment have very different roles and responsibilities than in a traditional organization. They are given responsibility, training, and authority to measure and control the quality of the work they produce, they work together in teams to address quality issues, they are cross-trained to be able to perform multiple tasks and have a greater understanding of the total production process, and they have a more intimate understanding of the operation and maintenance of their equipment. Employees are essential to the building of a continuous improvement organization.
- **Quality tools:** Discussion of the details of quality tools extends beyond the scope of this chapter, but there are seven basic quality tools that are used by front-line workers and managers in monitoring quality performance and gathering data for quality improvement activities. These tools include: cause-and-effect (fishbone) diagrams, flowcharts, checklists, control charts, scatter diagrams, Pareto analysis, and histograms. The beauty of these tools is that they are easy to understand and apply in on-going quality efforts.
- **Product design:** Product design is a key activity to avoid costly internal and external failure costs. For example, when a dental office designs the service process, it might have patients fill out a form that covers important information on general health issues, allergies, and medications. This helps to avoid future complications and problems. Staff, hygienists, and dentists are highly trained to follow proper procedures, the facility is both functional and pleasant, and the equipment and tools are state of the art to ensure that the patient's desired outcome is achieved. In a manufacturing setting, products should be designed to maximize product functionality, reliability, and manufacturability.
- **Process management:** "Quality at the Source" is an important concept in TQM. It means that managers and employees should be focused on the detailed activities in a process where good or bad quality is created. For example, in a Toyota plant in the United States in Georgetown, Kentucky, one of the work stations was responsible for installing seat belts and visors in every vehicle that came along the assembly line. There were 12 possible combinations of visors and seat belts that would go into any particular vehicle and the worker had to select the right combination and install the items in the vehicle in 55 seconds. Even the best workers made several errors during a shift on this activity. After studying the process, the workers came up with an idea to put all the items for a particular vehicle model in a blue plastic tote. With this change, the worker only had to make one decision per vehicle. Almost all the errors from the previous system were eliminated with this simple solution.
- **Supplier quality:** The focus on quality at the source extends to suppliers' processes as well, since the quality of a finished product is only as good as the quality of its individual parts and components, regardless of whether they come from internal or external sources. Sharing your quality and engineering expertise with your suppliers, having a formal supplier certification program, and including your suppliers in the product design stage are important measures to take to ensure that quality at the source extends to the supplier network.

### 6.2.3 Quality awards and standards

There are several quality awards and standards that are available for organizations to access. The large majority of organizations that use these programs use them as tools to help improve their quality processes and move toward implementing and successfully practicing TQM. The Malcolm Baldrige Award is a United States quality award that covers an extensive list of criteria that are evaluated by independent judges if an organization chooses to compete for the award. In many cases, organizations use the Baldrige criteria as a guide for their internal quality efforts rather than compete directly for the award. The criteria can be accessed from the Internet at: <http://www.baldrige.nist.gov/rnet><sup>3</sup>.

The International Organization for Standardization (ISO) sponsors a certification process for organizations that seek to learn and adopt superior methods for quality practice (ISO 9000) and environmentally responsible products and methods of production (ISO 14000). These certifications are increasingly used by organizations of all sizes to compete more effectively in a global marketplace due to the wide acceptance of ISO certification as a criterion for supplier selection. ISO 9000 and ISO 14000 are described on the ISO web page at: <http://www.iso.org/iso/home.htm><sup>4</sup>.

*“The ISO 9000 family addresses “quality management”. This means what the organization does to fulfill:*

*the customer’s quality requirements, and*

*applicable regulatory requirements, while aiming to*

*enhance customer satisfaction, and*

*achieve continual improvement of its performance in pursuit of these objectives.*

*The ISO 14000 family addresses “environmental management”. This means what the organization does to:*

*minimize harmful effects on the environment caused by its activities, and to*

*achieve continual improvement of its environmental performance.”*

Another popular quality award is the Deming Prize, which is a Japanese quality award for which organizations from any country can apply. The Deming Prize was named after W. Edwards Deming, an American statistician, author, and consultant who helped improve United States production capabilities during World War II, but is best known for his work in post-war Japan. He is widely credited with assisting the Japanese in rebuilding their nation’s production infrastructure in the areas of product design, product quality, and testing through the application of statistical methods. Florida Power and Electric was the first American company to win the Deming Prize, due to its meticulous use of formal approaches to quality improvement, data-based decision making, quality improvement teams, and the careful documentation of processes and procedures. More information on the Deming Prize can be found at:

<http://www.juse.or.jp/e/deming/index.html><sup>5</sup>

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<sup>3</sup><http://www.baldrige.nist.gov/rnet>

<sup>4</sup><http://www.iso.org/iso/home.htm>

<sup>5</sup><http://www.juse.or.jp/e/deming/index.html>

## 6.3 Requirements analysis<sup>6</sup>

### 6.3.1 Introduction

In systems engineering and software engineering, requirements analysis encompasses those tasks that go into determining the requirements of a new or altered system, taking account of the possibly conflicting requirements of the various stakeholders, such as users. Requirements analysis is critical to the success of a project.

Systematic requirements analysis is also known as requirements engineering. It is sometimes referred to loosely by names such as requirements gathering, requirements capture, or requirements specification. The term "requirements analysis" can also be applied specifically to the analysis proper (as opposed to elicitation or documentation of the requirements, for instance).

Requirements must be measurable, testable, related to identified business needs or opportunities, and defined to a level of detail sufficient for system design.

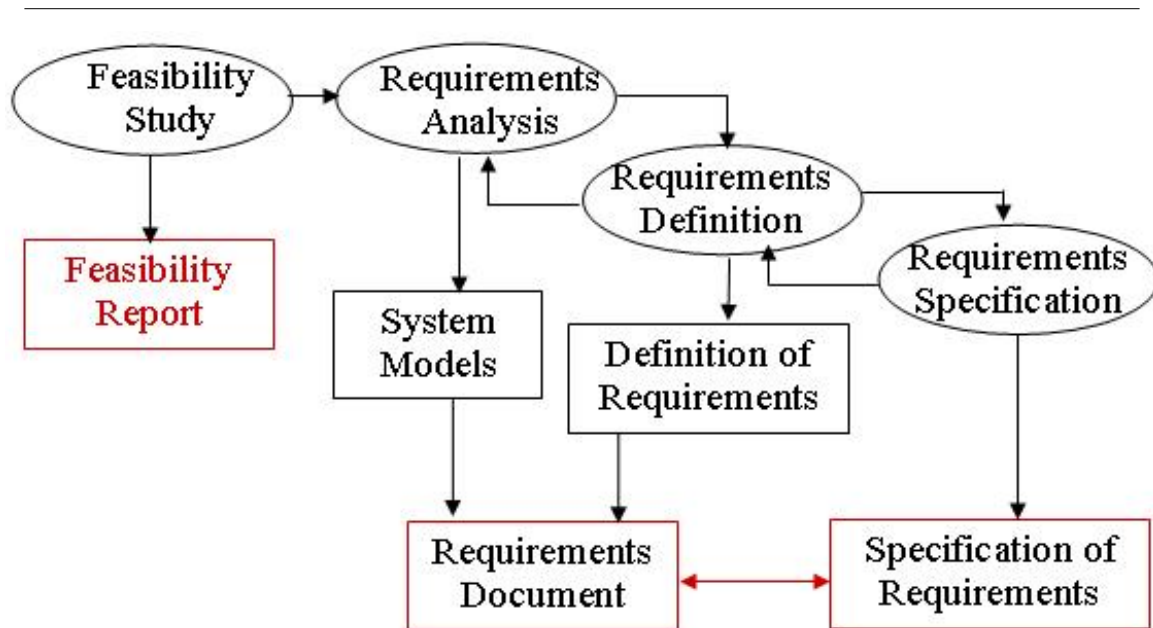


Figure 6.2: Requirements process

### 6.3.2 Software Requirements Fundamentals

#### 6.3.2.1 Definition of a Software Requirement

At its most basic, a software requirement is a property which must be exhibited in order to solve some problem in the real world. This session refers to requirements on “software” because it is concerned with problems to be addressed by software. Hence, a software requirement is a property which must be exhibited by software developed or adapted to solve a particular problem. The problem may be to automate part of a task of someone who will use the software, to support the business processes of the organization that

<sup>6</sup>This content is available online at <<http://cnx.org/content/m14621/1.6/>>.

has commissioned the software, to correct shortcomings of existing software, to control a device, and many more. The functioning of users, business processes, and devices is typically complex. By extension, therefore, the requirements on particular software are typically a complex combination of requirements from different people at different levels of an organization and from the environment in which the software will operate.

An essential property of all software requirements is that they be verifiable. It may be difficult or costly to verify certain software requirements. For example, verification of the throughput requirement on the call center may necessitate the development of simulation software. Both the software requirements and software quality personnel must ensure that the requirements can be verified within the available resource constraints.

Requirements have other attributes in addition to the behavioral properties that they express. Common examples include a priority rating to enable trade-offs in the face of finite resources and a status value to enable project progress to be monitored. Typically, software requirements are uniquely identified so that they can be over the entire software life cycle.

### **6.3.2.2 Product and Process Requirements**

A distinction can be drawn between product parameters and process parameters. Product parameters are requirements on software to be developed (for example, “The software shall verify that a student meets all prerequisites before he or she registers for a course.”).

A process parameter is essentially a constraint on the development of the software (for example, “The software shall be written in Ada.”). These are sometimes known as process requirements.

Some software requirements generate implicit process requirements. The choice of verification technique is one example. Another might be the use of particularly rigorous analysis techniques (such as formal specification methods) to reduce faults which can lead to inadequate reliability. Process requirements may also be imposed directly by the development organization, their customer, or a third party such as a safety regulator.

### **6.3.2.3 Functional and Non-functional Requirements**

Functional requirements describe the functions that the software is to execute; for example, formatting some text or modulating a signal. They are sometimes known as capabilities or statements of services the system should provide, how the system should react to particular inputs and how the system should behave in particular situations.

Nonfunctional requirements are the ones that act to constrain the solution. Nonfunctional requirements are sometimes known as constraints or quality requirements.

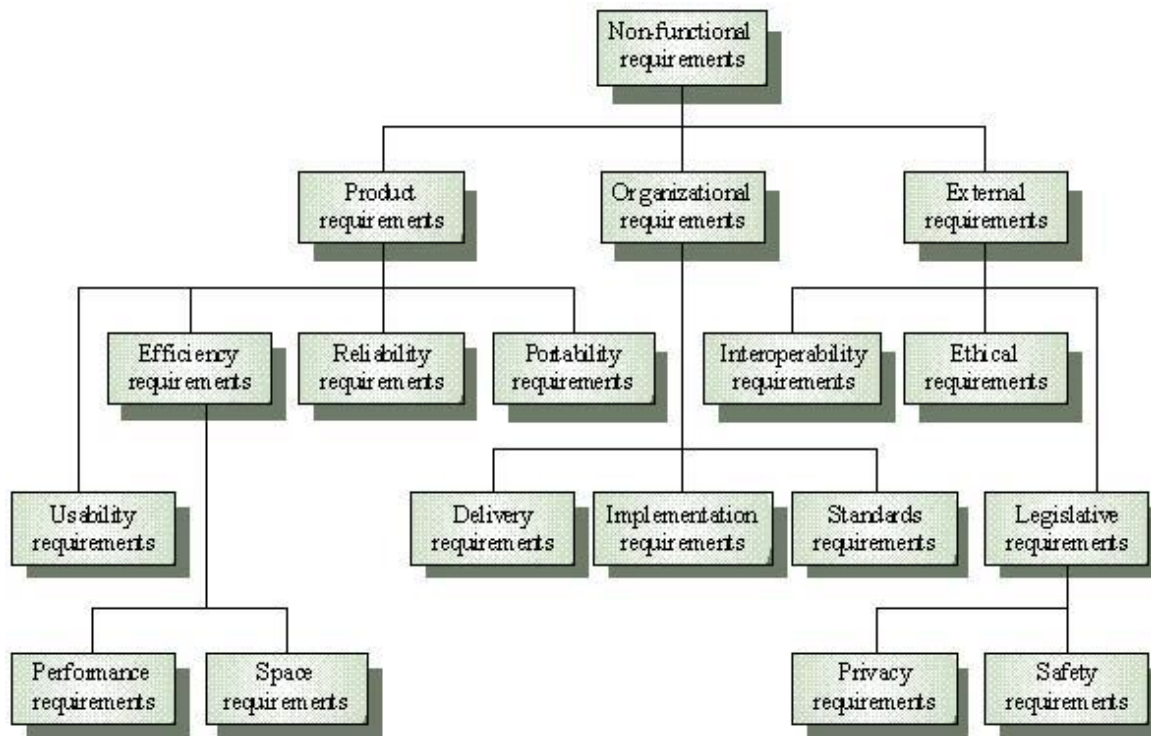


Figure 6.3: Nonfunctional Requirements

They can be further classified according to whether they are performance requirements, maintainability requirements, safety requirements, reliability requirements, or one of many other types of software requirements.

#### 6.3.2.4 Emergent Properties

Some requirements represent emergent properties of software—that is, requirements which cannot be addressed by a single component, but which depend for their satisfaction on how all the software components interoperate. The throughput requirement for a call center would, for example, depend on how the telephone system, information system, and the operators all interacted under actual operating conditions. Emergent properties are crucially dependent on the system architecture.

#### 6.3.2.5 Quantifiable Requirements

Software requirements should be stated as clearly and as unambiguously as possible, and, where appropriate, quantitatively. It is important to avoid vague and unverifiable requirements which depend for their interpretation on subjective judgment (“the software shall be reliable”; “the software shall be user-friendly”). This is particularly important for nonfunctional requirements. Two examples of quantified requirements are the following: a call center’s software must increase the center’s throughput by 20%; and a system shall have a probability of generating a fatal error during any hour of operation of less than  $1 * 10^{-8}$ . The throughput requirement is at a very high level and will need to be used to derive a number of detailed requirements. The reliability requirement will tightly constrain the system architecture.

### 6.3.2.6 System Requirements and Software Requirements

In this topic, system means “an interacting combination of elements to accomplish a defined objective. These include hardware, software, firmware, people, information, techniques, facilities, services, and other support elements,” as defined by the International Council on Systems Engineering.

System requirements are the requirements for the system as a whole. In a system containing software components, software requirements are derived from system requirements.

The literature on requirements sometimes calls system requirements “user requirements.” We can define “user requirements” in a restricted way as the requirements of the system’s customers or end-users. System requirements, by contrast, encompass user requirements, requirements of other stakeholders (such as regulatory authorities), and requirements without an identifiable human source.

## 6.3.3 Requirements Process

This section introduces the software requirements process, orienting the remaining five subareas and showing how the requirements process dovetails with the overall software engineering process.

### 6.3.3.1 Process Models

The objective of this topic is to provide an understanding that the requirements process

- Is not a discrete front-end activity of the software life cycle, but rather a process initiated at the beginning of a project and continuing to be refined throughout the life cycle
- Identifies software requirements as configuration items, and manages them using the same software configuration management practices as other products of the software life cycle processes
- Needs to be adapted to the organization and project context

In particular, the topic is concerned with how the activities of elicitation, analysis, specification, and validation are configured for different types of projects and constraints.

### 6.3.3.2 Process Actors

This topic introduces the roles of the people who participate in the requirements process. This process is fundamentally interdisciplinary, and the requirements specialist needs to mediate between the domain of the stakeholder and that of software engineering. There are often many people involved besides the requirements specialist, each of whom has a stake in the software. The stakeholders will vary across projects, but always include users/operators and customers (who need not be the same).

Typical examples of software stakeholders include (but are not restricted to)

- Users: This group comprises those who will operate the software. It is often a heterogeneous group comprising people with different roles and requirements.
- Customers: This group comprises those who have commissioned the software or who represent the software’s target market.
- Market analysts: A mass-market product will not have a commissioning customer, so marketing people are often needed to establish what the market needs and to act as proxy customers.
- Regulators: Many application domains such as banking and public transport are regulated. Software in these domains must comply with the requirements of the regulatory authorities.
- Software engineers: These individuals have a legitimate interest in profiting from developing the software by, for example, reusing components in other products. If, in this scenario, a customer of a particular product has specific requirements which compromise the potential for component reuse, the software engineers must carefully weigh their own stake against those of the customer.

It will not be possible to perfectly satisfy the requirements of every stakeholder, and it is the software engineer's job to negotiate trade-offs which are both acceptable to the principal stakeholders and within budgetary, technical, regulatory, and other constraints. A prerequisite for this is that all the stakeholders be identified, the nature of their "stake" analyzed, and their requirements elicited.

### 6.3.3.3 Process Support and Management

This topic introduces the project management resources required and consumed by the requirements process. It establishes the context for the first subarea (Initiation and scope definition) of the Software Engineering Management KA. Its principal purpose is to make the link between the process activities identified and the issues of cost, human resources, training, and tools.

### 6.3.3.4 Process Quality and Improvement

This topic is concerned with the assessment of the quality and improvement of the requirements process. Its purpose is to emphasize the key role the requirements process plays in terms of the cost and timeliness of a software product, and of the customer's satisfaction with it. It will help to orient the requirements process with quality standards and process improvement models for software and systems. Process quality and improvement is closely related to both the Software Quality KA and the Software Engineering Process KA. Of particular interest are issues of software quality attributes and measurement, and software process definition. This topic covers

- Requirements process coverage by process improvement standards and models
- Requirements process measures and benchmarking
- Improvement planning and implementation

## 6.3.4 Requirements Elicitation

Requirements elicitation is concerned with where software requirements come from and how the software engineer can collect them. It is the first stage in building an understanding of the problem the software is required to solve. It is fundamentally a human activity, and is where the stakeholders are identified and relationships established between the development team and the customer. It is variously termed "requirements capture," "requirements discovery," and "requirements acquisition."

One of the fundamental tenets of good software engineering is that there be good communication between software users and software engineers. Before development begins, requirements specialists may form the conduit for this communication. They must mediate between the domain of the software users (and other stakeholders) and the technical world of the software engineer.

### 6.3.4.1 Requirements Sources

Requirements have many sources in typical software, and it is essential that all potential sources be identified and evaluated for their impact on it. This topic is designed to promote awareness of the various sources of software requirements and of the frameworks for managing them. The main points covered are

- Goals: The term goal (sometimes called "business concern" or "critical success factor") refers to the overall, high-level objectives of the software. Goals provide the motivation for the software, but are often vaguely formulated. Software engineers need to pay particular attention to assessing the value (relative to priority) and cost of goals. A feasibility study is a relatively low-cost way of doing this.
- Domain knowledge: The software engineer needs to acquire, or have available, knowledge about the application domain. This enables them to infer tacit knowledge that the stakeholders do not articulate, assess the trade-offs that will be necessary between conflicting requirements, and, sometimes, to act as a "user" champion.

- Stakeholders: Much software has proved unsatisfactory because it has stressed the requirements of one group of stakeholders at the expense of those of others. Hence, software is delivered which is difficult to use or which subverts the cultural or political structures of the customer organization. The software engineer needs to identify, represent, and manage the “viewpoints” of many different types of stakeholders.
- The operational environment: Requirements will be derived from the environment in which the software will be executed. These may be, for example, timing constraints in real-time software or interoperability constraints in an office environment. These must be actively sought out, because they can greatly affect software feasibility and cost, and restrict design choices.
- The organizational environment: Software is often required to support a business process, the selection of which may be conditioned by the structure, culture, and internal politics of the organization. The software engineer needs to be sensitive to these, since, in general, new software should not force unplanned change on the business process.

#### 6.3.4.2 Elicitation Techniques

Once the requirements sources have been identified, the software engineer can start eliciting requirements from them. This topic concentrates on techniques for getting human stakeholders to articulate their requirements. It is a very difficult area and the software engineer needs to be sensitized to the fact that (for example) users may have difficulty describing their tasks, may leave important information unstated, or may be unwilling or unable to cooperate. It is particularly important to understand that elicitation is not a passive activity, and that, even if cooperative and articulate stakeholders are available, the software engineer has to work hard to elicit the right information. A number of techniques exist for doing this, the principal ones being:

- Interviews: a “traditional” means of eliciting requirements. It is important to understand the advantages and limitations of interviews and how they should be conducted.
- Scenarios: a valuable means for providing context to the elicitation of user requirements. They allow the software engineer to provide a framework for questions about user tasks by permitting “what if” and “how is this done” questions to be asked. The most common type of scenario is the use case.
- Prototypes: a valuable tool for clarifying unclear requirements. They can act in a similar way to scenarios by providing users with a context within which they can better understand what information they need to provide. There is a wide range of prototyping techniques, from paper mock-ups of screen designs to beta-test versions of software products, and a strong overlap of their use for requirements elicitation and the use of prototypes for requirements validation.
- Facilitated meetings: The purpose of these is to try to achieve a summative effect whereby a group of people can bring more insight into their software requirements than by working individually. They can brainstorm and refine ideas which may be difficult to bring to the surface using interviews. Another advantage is that conflicting requirements surface early on in a way that lets the stakeholders recognize where there is conflict. When it works well, this technique may result in a richer and more consistent set of requirements than might otherwise be achievable. However, meetings need to be handled carefully (hence the need for a facilitator) to prevent a situation from occurring where the critical abilities of the team are eroded by group loyalty, or the requirements reflecting the concerns of a few outspoken (and perhaps senior) people are favored to the detriment of others.
- Observation: The importance of software context within the organizational environment has led to the adaptation of observational techniques for requirements elicitation. Software engineers learn about user tasks by immersing themselves in the environment and observing how users interact with their software and with each other. These techniques are relatively expensive, but they are instructive because they illustrate that many user tasks and business processes are too subtle and complex for their actors to describe easily.



### 6.3.5 Requirements Analysis

This topic is concerned with the process of analyzing requirements to

- Detect and resolve conflicts between requirements
- Discover the bounds of the software and how it must interact with its environment
- Elaborate system requirements to derive software requirements

The traditional view of requirements analysis has been that it be reduced to conceptual modeling using one of a number of analysis methods such as the Structured Analysis and Design Technique (SADT). While conceptual modeling is important, we include the classification of requirements to help inform trade-offs between requirements (requirements classification) and the process of establishing these trade-offs (requirements negotiation).

Care must be taken to describe requirements precisely enough to enable the requirements to be validated, their implementation to be verified, and their costs to be estimated.

#### 6.3.5.1 Requirements Classification

Requirements can be classified on a number of dimensions:

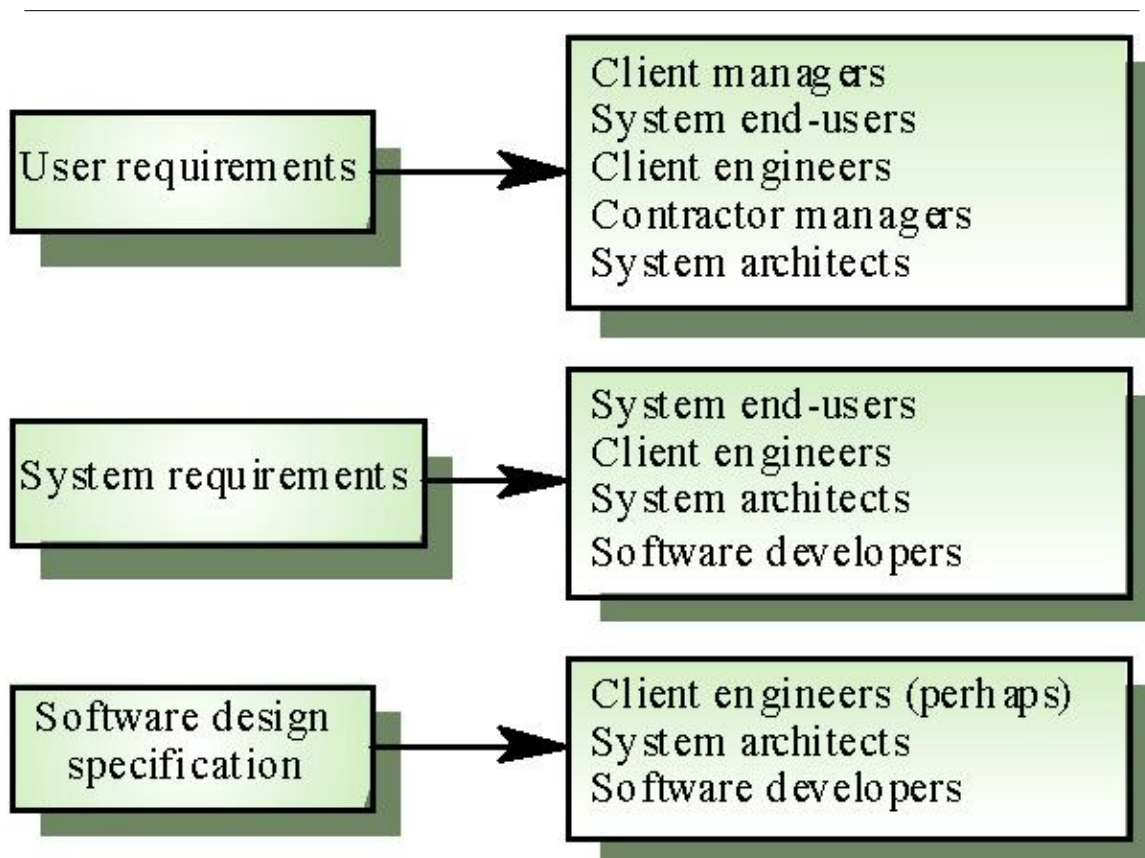


Figure 6.4: Requirement types

Other classifications may be appropriate, depending upon the organization's normal practice and the application itself.

There is a strong overlap between requirements classification and requirements attributes.

### 6.3.5.2 Conceptual Modeling

The development of models of a real-world problem is key to software requirements analysis. Their purpose is to aid in understanding the problem, rather than to initiate design of the solution. Hence, conceptual models comprise models of entities from the problem domain configured to reflect their real-world relationships and dependencies.

Several kinds of models can be developed. These include data and control flows, state models, event traces, user interactions, object models, data models, and many others. The factors that influence the choice of model include

- The nature of the problem. Some types of software demand that certain aspects be analyzed particularly rigorously. For example, control flow and state models are likely to be more important for real-time software than for management information software, while it would usually be the opposite for data models.
- The expertise of the software engineer. It is often more productive to adopt a modeling notation or method with which the software engineer has experience.
- The process requirements of the customer. Customers may impose their favored notation or method, or prohibit any with which they are unfamiliar. This factor can conflict with the previous factor.
- The availability of methods and tools. Notations or methods which are poorly supported by training and tools may not achieve widespread acceptance even if they are suited to particular types of problems.

Note that, in almost all cases, it is useful to start by building a model of the software context. The software context provides a connection between the intended software and its external environment. This is crucial to understanding the software's context in its operational environment and to identifying its interfaces with the environment.

The issue of modeling is tightly coupled with that of methods. For practical purposes, a method is a notation (or set of notations) supported by a process which guides the application of the notations. There is little empirical evidence to support claims for the superiority of one notation over another. However, the widespread acceptance of a particular method or notation can lead to beneficial industry-wide pooling of skills and knowledge. This is currently the situation with the UML (Unified Modeling Language).

Formal modeling using notations based on discrete mathematics, and which are traceable to logical reasoning, have made an impact in some specialized domains. These may be imposed by customers or standards or may offer compelling advantages to the analysis of certain critical functions or components.

Two standards provide notations which may be useful in performing conceptual modeling—IEEE Std 1320.1, IDEF0 for functional modeling; and IEEE Std 1320.2, IDEF1X97 (IDEFObject) for information modeling.

### 6.3.5.3 Architectural Design and Requirements Allocation

At some point, the architecture of the solution must be derived. Architectural design is the point at which the requirements process overlaps with software or systems design and illustrates how impossible it is to cleanly decouple the two tasks. This topic is closely related to the Software Structure and Architecture subarea in the Software Design KA. In many cases, the software engineer acts as software architect because the process of analyzing and elaborating the requirements demands that the components that will be responsible for satisfying the requirements be identified. This is requirements allocation—the assignment, to components, of the responsibility for satisfying requirements.

Allocation is important to permit detailed analysis of requirements. Hence, for example, once a set of requirements has been allocated to a component, the individual requirements can be further analyzed to discover further requirements on how the component needs to interact with other components in order to

satisfy the allocated requirements. In large projects, allocation stimulates a new round of analysis for each subsystem.

Architectural design is closely identified with conceptual modeling. The mapping from real-world domain entities to software components is not always obvious, so architectural design is identified as a separate topic. The requirements of notations and methods are broadly the same for both conceptual modeling and architectural design.

#### **6.3.5.4 Requirements Negotiation**

Another term commonly used for this sub-topic is “conflict resolution.” This concerns resolving problems with requirements where conflicts occur between two stakeholders requiring mutually incompatible features, between requirements and resources, or between functional and non-functional requirements. In most cases, it is unwise for the software engineer to make a unilateral decision, and so it becomes necessary to consult with the stakeholder(s) to reach a consensus on an appropriate trade-off. It is often important for contractual reasons that such decisions be traceable back to the customer. We have classified this as a software requirements analysis topic because problems emerge as the result of analysis. However, a strong case can also be made for considering it a requirements validation topic.

#### **6.3.5.5 Requirements Specification**

For most engineering professions, the term “specification” refers to the assignment of numerical values or limits to a product’s design goals. Typical physical systems have a relatively small number of such values. Typical software has a large number of requirements, and the emphasis is shared between performing the numerical quantification and managing the complexity of interaction among the large number of requirements. So, in software engineering jargon, “software requirements specification” typically refers to the production of a document, or its electronic equivalent, which can be systematically reviewed, evaluated, and approved.

For complex systems, particularly those involving substantial non-software components, as many as three different types of documents are produced: system definition, system requirements, and software requirements. For simple software products, only the third of these is required.

There are some approaches to requirements specification:

- Natural language
- Structured natural language
- Design description language
- Requirements specification language
- Graphical notation
- Formal specification

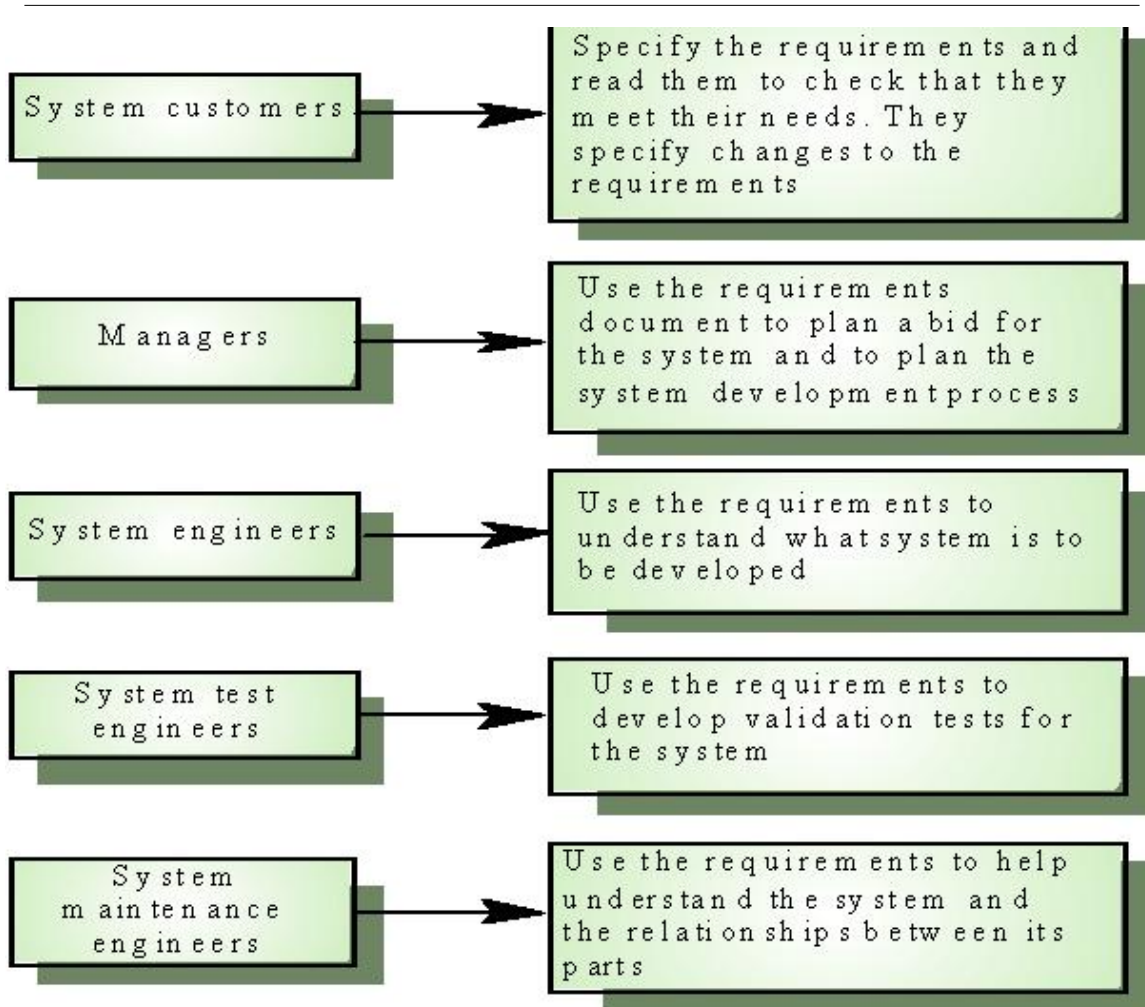


Figure 6.5: Types of requirement document

### 6.3.5.6 The System Definition Document

This document (sometimes known as the user requirements document or concept of operations) records the system requirements. It defines the high-level system requirements from the domain perspective. Its readership includes representatives of the system users/customers (marketing may play these roles for market-driven software), so its content must be couched in terms of the domain. The document lists the system requirements along with background information about the overall objectives for the system, its target environment and a statement of the constraints, assumptions, and non-functional requirements. It may include conceptual models designed to illustrate the system context, usage scenarios and the principal domain entities, as well as data, information, and workflows. IEEE Std 1362, Concept of Operations Document, provides advice on the preparation and content of such a document. (IEEE1362-98)

### 6.3.5.7 System Requirements Specification

Developers of systems with substantial software and non-software components, a modern airliner, for example, often separate the description of system requirements from the description of software requirements. In this view, system requirements are specified, the software requirements are derived from the system requirements, and then the requirements for the software components are specified. Strictly speaking, system requirements specification is a systems engineering activity and falls outside the scope of this Guide. IEEE Std 1233 is a guide for developing system requirements.

### 6.3.5.8 Software Requirements Specification

Software requirements specification establishes the basis for agreement between customers and contractors or suppliers (in market-driven projects, these roles may be played by the marketing and development divisions) on what the software product is to do, as well as what it is not expected to do. For non-technical readers, the software requirements specification document is often accompanied by a software requirements definition document.

Software requirements specification permits a rigorous assessment of requirements before design can begin and reduces later redesign. It should also provide a realistic basis for estimating product costs, risks, and schedules.

Organizations can also use a software requirements specification document to develop their own validation and verification plans more productively.

Software requirements specification provides an informed basis for transferring a software product to new users or new machines. Finally, it can provide a basis for software enhancement.

Software requirements are often written in natural language, but, in software requirements specification, this may be supplemented by formal or semi-formal descriptions. Selection of appropriate notations permits particular requirements and aspects of the software architecture to be described more precisely and concisely than natural language. The general rule is that notations should be used which allow the requirements to be described as precisely as possible. This is particularly crucial for safety-critical and certain other types of dependable software. However, the choice of notation is often constrained by the training, skills and preferences of the document's authors and readers.

A number of quality indicators have been developed which can be used to relate the quality of software requirements specification to other project variables such as cost, acceptance, performance, schedule, reproducibility, etc. Quality indicators for individual software requirements specification statements include imperatives, directives, weak phrases, options, and continuances. Indicators for the entire software requirements specification document include size, readability, specification, depth, and text structure.

## 6.3.6 Requirements validation

The requirements documents may be subject to validation and verification procedures. The requirements may be validated to ensure that the software engineer has understood the requirements, and it is also important to verify that a requirements document conforms to company standards, and that it is understandable, consistent, and complete. Formal notations offer the important advantage of permitting the last two properties to be proven (in a restricted sense, at least). Different stakeholders, including representatives of the customer and developer, should review the document(s). Requirements documents are subject to the same software configuration management practices as the other deliverables of the software life cycle processes.

It is normal to explicitly schedule one or more points in the requirements process where the requirements are validated. The aim is to pick up any problems before resources are committed to addressing the requirements. Requirements validation is concerned with the process of examining the requirements document to ensure that it defines the right software (that is, the software that the users expect).

### 6.3.6.1 Requirements Reviews

Perhaps the most common means of validation is by inspection or reviews of the requirements document(s). A group of reviewers is assigned a brief to look for errors, mistaken assumptions, lack of clarity, and deviation from standard practice. The composition of the group that conducts the review is important (at least one representative of the customer should be included for a customer-driven project, for example), and it may help to provide guidance on what to look for in the form of checklists.

Reviews may be constituted on completion of the system definition document, the system specification document, the software requirements specification document, the baseline specification for a new release, or at any other step in the process.

### 6.3.6.2 Prototyping

Prototyping is commonly a means for validating the software engineer's interpretation of the software requirements, as well as for eliciting new requirements. As with elicitation, there is a range of prototyping techniques and a number of points in the process where prototype validation may be appropriate. The advantage of prototypes is that they can make it easier to interpret the software engineer's assumptions and, where needed, give useful feedback on why they are wrong. For example, the dynamic behavior of a user interface can be better understood through an animated prototype than through textual description or graphical models. There are also disadvantages, however. These include the danger of users' attention being distracted from the core underlying functionality by cosmetic issues or quality problems with the prototype. For this reason, several people recommend prototypes which avoid software, such as flip-chart-based mock-ups. Prototypes may be costly to develop. However, if they avoid the wastage of resources caused by trying to satisfy erroneous requirements, their cost can be more easily justified.

### 6.3.6.3 Model Validation

It is typically necessary to validate the quality of the models developed during analysis. For example, in object models, it is useful to perform a static analysis to verify that communication paths exist between objects which, in the stakeholders' domain, exchange data. If formal specification notations are used, it is possible to use formal reasoning to prove specification properties.

### 6.3.6.4 Acceptance Tests

An essential property of a software requirement is that it should be possible to validate that the finished product satisfies it. Requirements which cannot be validated are really just "wishes." An important task is therefore planning how to verify each requirement. In most cases, designing acceptance tests does this.

Identifying and designing acceptance tests may be difficult for non-functional requirements. To be validated, they must first be analyzed to the point where they can be expressed quantitatively.

## 6.3.7 Practical Considerations

The first level of decomposition of subareas presented in this KA may seem to describe a linear sequence of activities. This is a simplified view of the process.

The requirements process spans the whole software life cycle. Change management and the maintenance of the requirements in a state which accurately mirrors the software to be built, or that has been built, are key to the success of the software engineering process.

Not every organization has a culture of documenting and managing requirements. It is frequent in dynamic start-up companies, driven by a strong "product vision" and limited resources, to view requirements documentation as an unnecessary overhead. Most often, however, as these companies expand, as their customer base grows, and as their product starts to evolve, they discover that they need to recover the requirements that motivated product features in order to assess the impact of proposed changes. Hence, requirements documentation and change management are key to the success of any requirements process.

### 6.3.7.1 Iterative Nature of the Requirements Process

There is general pressure in the software industry for ever shorter development cycles, and this is particularly pronounced in highly competitive market-driven sectors. Moreover, most projects are constrained in some way by their environment, and many are upgrades to, or revisions of, existing software where the architecture is a given. In practice, therefore, it is almost always impractical to implement the requirements process as a linear, deterministic process in which software requirements are elicited from the stakeholders, baselined, allocated, and handed over to the software development team. It is certainly a myth that the requirements for large software projects are ever perfectly understood or perfectly specified.

Instead, requirements typically iterate towards a level of quality and detail which is sufficient to permit design and procurement decisions to be made. In some projects, this may result in the requirements being baselined before all their properties are fully understood. This risks expensive rework if problems emerge late in the software engineering process. However, software engineers are necessarily constrained by project management plans and must therefore take steps to ensure that the “quality” of the requirements is as high as possible given the available resources. They should, for example, make explicit any assumptions which underpin the requirements, as well as any known problems.

In almost all cases, requirements understanding continues to evolve as design and development proceeds. This often leads to the revision of requirements late in the life cycle. Perhaps the most crucial point in understanding requirements engineering is that a significant proportion of the requirements will change. This is sometimes due to errors in the analysis, but it is frequently an inevitable consequence of change in the “environment”: for example, the customer’s operating or business environment, or the market into which software must sell. Whatever the cause, it is important to recognize the inevitability of change and take steps to mitigate its effects. Change has to be managed by ensuring that proposed changes go through a defined review and approval process, and, by applying careful requirements tracing, impact analysis, and software configuration management. Hence, the requirements process is not merely a front-end task in software development, but spans the whole software life cycle. In a typical project, the software requirements activities evolve over time from elicitation to change management.

### 6.3.7.2 Change Management

Change management is central to the management of requirements. This topic describes the role of change management, the procedures that need to be in place, and the analysis that should be applied to proposed changes. It has strong links to the Software Configuration Management KA.

### 6.3.7.3 Requirements Attributes

Requirements should consist not only of a specification of what is required, but also of ancillary information which helps manage and interpret the requirements. This should include the various classification dimensions of the requirement and the verification method or acceptance test plan. It may also include additional information such as a summary rationale for each requirement, the source of each requirement, and a change history. The most important requirements attribute, however, is an identifier which allows the requirements to be uniquely and unambiguously identified.

### 6.3.7.4 Requirements Tracing

Requirements tracing is concerned with recovering the source of requirements and predicting the effects of requirements. Tracing is fundamental to performing impact analysis when requirements change. A requirement should be traceable backwards to the requirements and stakeholders which motivated it (from a software requirement back to the system requirement(s) that it helps satisfy, for example). Conversely, a requirement should be traceable forwards into the requirements and design entities that satisfy it (for example, from a system requirement into the software requirements that have been elaborated from it, and on into the code modules that implement it).

### 6.3.7.5 Measuring Requirements

As a practical matter, it is typically useful to have some concept of the “volume” of the requirements for a particular software product. This number is useful in evaluating the “size” of a change in requirements, in estimating the cost of a development or maintenance task, or simply for use as the denominator in other measurements.

<b>Property</b>	<b>Measure</b>
<b>Speed</b>	Processed transactions/second User/Event response time Screen refresh time
<b>Size</b>	K Bytes Number of RAM chips
<b>Ease of use</b>	Training time Number of help frames
<b>Reliability</b>	Mean time to failure Probability of unavailability Rate of failure occurrence Availability
<b>Robustness</b>	Time to restart after failure Percentage of events causing failure Probability of data corruption on failure
<b>Portability</b>	Percentage of target dependent statements Number of target systems

Figure 6.6: Requirement measurements

## 6.4 Software quality management<sup>7</sup>

### 6.4.1 Introduction

What is software quality, and why is it so important that it is pervasive in the Software Engineering Body of Knowledge? Within an information system, software is a tool, and tools have to be selected for quality and for appropriateness. That is the role of requirements. But software is more than a tool. It dictates the performance of the system, and it is therefore important to the system quality.

The notion of “quality” is not as simple as it may seem. For any engineered product, there are many desired qualities relevant to a particular project, to be discussed and determined at the time that the product requirements are determined. Qualities may be present or absent, or may be matters of degree, with tradeoffs among them, with practicality and cost as major considerations. The software engineer has a responsibility to

<sup>7</sup>This content is available online at <<http://cnx.org/content/m28899/1.1/>>.



elicit the system's quality requirements that may not be explicit at the outset and to discuss their importance and the difficulty of attaining them. All processes associated with software quality (e.g. building, checking, improving quality) will be designed with these in mind

and carry costs based on the design. Thus, it is important to have in mind some of the possible attributes of quality.

Various researchers have produced models (usually taxonomic) of software quality characteristics or attributes that can be useful for discussing, planning, and rating the quality of software products. The models often include metrics to "measure" the degree of each quality attribute the product attains.

Usually these metrics may be applied at any of the product levels. They are not always direct measures of the quality characteristics of the finished product, but may be relevant to the achievement of overall quality. Each model may have a different set of attributes at the highest level of the taxonomy, and selection of and definitions for the attributes at all levels may differ. The important point is that the system software requirements define the quality requirements and the definitions of the attributes for them.

## 6.4.2 Software Quality Fundamentals

Agreement on quality requirements, as well as clear communication to the software engineer on what constitutes quality, require that the many aspects of quality be formally defined and discussed.

A software engineer should understand the underlying meanings of quality concepts and characteristics and their value to the software under development or to maintenance.

The important concept is that the software requirements define the required quality characteristics of the software and influence the measurement methods and acceptance criteria for assessing these characteristics.

### 6.4.2.1 Software Engineering Culture and Ethics

Software engineers are expected to share a commitment to software quality as part of their culture.

Ethics can play a significant role in software quality, the culture, and the attitudes of software engineers. The IEEE Computer Society and the ACM have developed a code of ethics and professional practice based on eight principles to help software engineers reinforce attitudes related to quality and to the independence of their work.

### 6.4.2.2 Value and Costs of Quality

The notion of "quality" is not as simple as it may seem. For any engineered product, there are many desired qualities relevant to a particular perspective of the product, to be discussed and determined at the time that the product requirements are set down. Quality characteristics may be required or not, or may be required to a greater or lesser degree, and trade-offs may be made among them.

The cost of quality can be differentiated into prevention cost, appraisal cost, internal failure cost, and external failure cost.

A motivation behind a software project is the desire to create software that has value, and this value may or may not be quantified as a cost. The customer will have some maximum cost in mind, in return for which it is expected that the basic purpose of the software will be fulfilled. The customer may also have some expectation as to the quality of the software. Sometimes customers may not have thought through the quality issues or their related costs. Is the characteristic merely decorative, or is it essential to the software? If the answer lies somewhere in between, as is almost always the case, it is a matter of making the customer a part of the decision process and fully aware of both costs and benefits. Ideally, most of these decisions will be made in the software requirements process, but these issues may arise throughout the software life cycle. There is no definite rule as to how these decisions should be made, but the software engineer should be able to present quality alternatives and their costs.

### 6.4.2.3 Models and Quality Characteristics

Terminology for software quality characteristics differs from one taxonomy (or model of software quality) to another, each model perhaps having a different number of hierarchical levels and a different total number of characteristics. Various authors have produced models of software quality characteristics or attributes which can be useful for discussing, planning, and rating the quality of software products. ISO/IEC has defined three related models of software product quality (internal quality, external quality, and quality in use) (ISO9126-01) and a set of related parts (ISO14598-98).

#### 6.4.2.3.1 Software engineering process quality

Software quality management and software engineering process quality have a direct bearing on the quality of the software product.

Models and criteria which evaluate the capabilities of software organizations are primarily project organization and management considerations, and, as such, are covered in the Software Engineering Management and Software Engineering Process.

Of course, it is not possible to completely distinguish the quality of the process from the quality of the product.

Process quality influences the quality characteristics of software products, which in turn affect quality-in-use as perceived by the customer.

Two important quality standards are TickIT and one which has an impact on software quality, the ISO9001-00 standard, along with its guidelines for application to software.

Another industry standard on software quality is CMMI. CMMI intends to provide guidance for improving processes. Specific process areas related to quality management are process and product quality assurance, process verification, and process validation. CMMI classifies reviews and audits as methods of verification, and not as specific processes like.

There was initially some debate over whether ISO9001 or CMMI should be used by software engineers to ensure quality. This debate is widely published, and, as a result, the position has been taken that the two are complementary and that having ISO9001 certification can help greatly in achieving the higher maturity levels of the CMMI.

#### 6.4.2.3.2 Software product quality

The software engineer needs, first of all, to determine the real purpose of the software. In this regard, it is of prime importance to keep in mind that the customer's requirements come first and that they include quality requirements, not just functional requirements. Thus, the software engineer has a responsibility to elicit quality requirements which may not be explicit at the outset and to discuss their importance as well as the level of difficulty in attaining them. All processes associated with software quality (for example, building, checking, and improving quality) will be designed with these requirements in mind, and they carry additional costs.

Standard ISO9126-01 defines, for two of its three models of quality, the related quality characteristics and sub-characteristics, and measures which are useful for assessing software product quality.

The meaning of the term "product" is extended to include any artifact which is the output of any process used to build the final software product. Examples of a product include, but are not limited to, an entire system requirements specification, a software requirements specification for a software component of a system, a design module, code, test documentation, or reports produced as a result of quality analysis tasks. While most treatments of quality are described in terms of the final software and system performance, sound engineering practice requires that intermediate products relevant to quality be evaluated throughout the software engineering process.

#### 6.4.2.4 Quality Improvement

The quality of software products can be improved through an iterative process of continuous improvement which requires management control, coordination, and feedback from many concurrent processes: the software life cycle processes; the process of error/defect detection, removal, and prevention; and the quality improvement process.

The theory and concepts behind quality improvement, such as building in quality through the prevention and early detection of errors, continuous improvement, and customer focus, are pertinent to software engineering. These concepts are based on the work of experts in quality who have stated that the quality of a product is directly linked to the quality of the process used to create it.

Approaches such as the Total Quality Management (TQM) process of Plan, Do, Check, and Act (PDCA) are tools by which quality objectives can be met. Management sponsorship supports process and product evaluations and the resulting findings. Then, an improvement program is developed identifying detailed actions and improvement projects to be addressed in a feasible time frame. Management support implies that each improvement project has enough resources to achieve the goal defined for it. Management sponsorship must be solicited frequently by implementing proactive communication activities. The involvement of work groups, as well as middle-management support and resources allocated at project level.

### 6.4.3 Software Quality Management Processes

Software quality management (SQM) applies to all perspectives of software processes, products, and resources. It defines processes, process owners, and requirements for those processes, measurements of the process and its outputs, and feedback channels. Software quality management processes consist of many activities. Some may find defects directly, while others indicate where further examination may be valuable. The latter are also referred to as direct-defect-finding activities. Many activities often serve as both.

Planning for software quality involves:

- Defining the required product in terms of its quality characteristics.
- Planning the processes to achieve the required product.

These aspects differ from, for instance, the planning SQM processes themselves, which assess planned quality characteristics versus actual implementation of those plans. The software quality management processes must address how well software products will, or do, satisfy customer and stakeholder requirements, provide value to the customers and other stakeholders, and provide the software quality needed to meet software requirements.

SQM can be used to evaluate the intermediate products as well as the final product.

Some of the specific SQM processes are defined in standard (IEEE12207.0-96):

- Quality assurance process
- Verification process
- Validation process
- Review process
- Audit process

These processes encourage quality and also find possible problems. But they differ somewhat in their emphasis.

SQM processes help ensure better software quality in a given project. They also provide, as a by-product, general information to management, including an indication of the quality of the entire software engineering process. The Software Engineering Process and Software Engineering Management KAs discuss quality programs for the organization developing the software. SQM can provide relevant feedback for these areas.

SQM processes consist of tasks and techniques to indicate how software plans (for example, management, development, configuration management) are being implemented and how well the intermediate and final products are meeting their specified requirements. Results from these tasks are assembled in reports for

management before corrective action is taken. The management of an SQM process is tasked with ensuring that the results of these reports are accurate.

As described in this KA, SQM processes are closely related; they can overlap and are sometimes even combined. They seem largely reactive in nature because they address the processes as practiced and the products as produced; but they have a major role at the planning stage in being proactive in terms of the processes and procedures needed to attain the quality characteristics and degree of quality needed by the stakeholders in the software.

Risk management can also play an important role in delivering quality software. Incorporating disciplined risk analysis and management techniques into the software life cycle processes can increase the potential for producing a quality product.

#### **6.4.3.1 Software Quality Assurance**

SQA processes provide assurance that the software products and processes in the project life cycle conform to their specified requirements by planning, enacting, and performing a set of activities to provide adequate confidence that quality is being built into the software. This means ensuring that the problem is clearly and adequately stated and that the solution's requirements are properly defined and expressed. SQA seeks to maintain the quality throughout the development and maintenance of the product by the execution of a variety of activities at each stage which can result in early identification of problems, an almost inevitable feature of any complex activity. The role of SQA with respect to process is to ensure that planned processes are appropriate and later implemented according to plan, and that relevant measurement processes are provided to the appropriate organization.

The SQA plan defines the means that will be used to ensure that software developed for a specific product satisfies the user's requirements and is of the highest quality possible within project constraints. In order to do so, it must first ensure that the quality target is clearly defined and understood. It must consider management, development, and maintenance plans for the software. Refer to standard (IEEE730-98) for details.

The specific quality activities and tasks are laid out, with their costs and resource requirements, their overall management objectives, and their schedule in relation to those objectives in the software engineering management, development, or maintenance plans. The SQA plan should be consistent with the software configuration management plan. The SQA plan identifies documents, standards, practices, and conventions governing the project and how they will be checked and monitored to ensure adequacy and compliance. The SQA plan also identifies measures, statistical techniques, procedures for problem reporting and corrective action, resources such as tools, techniques, and methodologies, security for physical media, training, and SQA reporting and documentation. Moreover, the SQA plan addresses the software quality assurance activities of any other type of activity described in the software plans, such as procurement of supplier software to the project or commercial off-the-shelf software (COTS) installation, and service after delivery of the software. It can also contain acceptance criteria as well as reporting and management activities which are critical to software quality.

#### **6.4.3.2 Verification & Validation**

For purposes of brevity, Verification and Validation (V&V) are treated as a single topic in this Guide rather than as two separate topics as in the standard (IEEE12207.0-96). "Software V&V is a disciplined approach to assessing software products throughout the product life cycle. A V&V effort strives to ensure that quality is built into the software and that the software satisfies user requirements" (IEEE1059-93).

V&V addresses software product quality directly and uses testing techniques which can locate defects so that they can be addressed. It also assesses the intermediate products, however, and, in this capacity, the intermediate steps of the software life cycle processes.

The V&V process determines whether or not products of a given development or maintenance activity conform to the requirement of that activity, and whether or not the final software product fulfills its intended purpose and meets user requirements. Verification is an attempt to ensure that the product is built correctly,

in the sense that the output products of an activity meet the specifications imposed on them in previous activities. Validation is an attempt to ensure that the right product is built, that is, the product fulfills its specific intended purpose. Both the verification process and the validation process begin early in the development or maintenance phase. They provide an examination of key product features in relation both to the product's immediate predecessor and to the specifications it must meet.

The purpose of planning V&V is to ensure that each resource, role, and responsibility is clearly assigned. The resulting V&V plan documents and describes the various resources and their roles and activities, as well as the techniques and tools to be used. An understanding of the different purposes of each V&V activity will help in the careful planning of the techniques and resources needed to fulfill their purposes.

The plan also addresses the management, communication, policies, and procedures of the V&V activities and their interaction, as well as defect reporting and documentation requirements.

### **6.4.3.3 Reviews and Audits**

For purposes of brevity, reviews and audits are treated as a single topic in this Guide, rather than as two separate topics as in (IEEE12207.0-96). The review and audit process is broadly defined in (IEEE12207.0-96) and in more detail in (IEEE1028-97). Five types of reviews or audits are presented in the IEEE1028-97 standard:

- Management reviews
- Technical reviews
- Inspections
- Walk-throughs
- Audits

#### **6.4.3.3.1 Management reviews**

The purpose of a management review is to monitor progress, determine the status of plans and schedules, confirm requirements and their system allocation, or evaluate the effectiveness of management approaches used to achieve fitness for purpose. They support decisions about changes and corrective actions that are required during a software project. Management reviews determine the adequacy of plans, schedules, and requirements and monitor their progress or inconsistencies. These reviews may be performed on products such as audit reports, progress reports, V&V reports, and plans of many types, including risk management, project management, software configuration management, software safety, and risk assessment, among others.

#### **6.4.3.3.2 Technical reviews**

“The purpose of a technical review is to evaluate a software product to determine its suitability for its intended use. The objective is to identify discrepancies from approved specifications and standards. The results should provide management with evidence confirming (or not) that the product meets the specifications and adheres to standards, and that changes are controlled” (IEEE1028-97).

Specific roles must be established in a technical review: a decision-maker, a review leader, a recorder, and technical staff to support the review activities. A technical review requires that mandatory inputs be in place in order to proceed:

- Statement of objectives
- A specific software product
- The specific project management plan
- The issues list associated with this product
- The technical review procedure

The team follows the review procedure. A technically qualified individual presents an overview of the product, and the examination is conducted during one or more meetings. The technical review is completed once all the activities listed in the examination have been completed.

#### 6.4.3.3.3 Inspections

The purpose of an inspection is to detect and identify software product anomalies. Two important differentiators of inspections as opposed to reviews are as follows:

- An individual holding a management position over any member of the inspection team shall not participate in the inspection.
- An inspection is to be led by an impartial facilitator who is trained in inspection techniques.

Software inspections always involve the author of an intermediate or final product, while other reviews might not. Inspections also include an inspection leader, a recorder, a reader, and a few (2 to 5) inspectors. The members of an inspection team may possess different expertise, such as domain expertise, design method expertise, or language expertise. Inspections are usually conducted on one relatively small section of the product at a time. Each team member must examine the software product and other review inputs prior to the review meeting, perhaps by applying an analytical technique to a small section of the product, or to the entire product with a focus only on one aspect, for example, interfaces. Any anomaly found is documented and sent to the inspection leader. During the inspection, the inspection leader conducts the session and verifies that everyone has prepared for the inspection. A checklist, with anomalies and questions germane to the issues of interest, is a common tool used in inspections. The resulting list often classifies the anomalies and is reviewed for completeness and accuracy by the team. The inspection exit decision must correspond to one of the following three criteria:

- Accept with no or at most minor reworking
- Accept with rework verification
- Reinspect

Inspection meetings typically last a few hours, whereas technical reviews and audits are usually broader in scope and take longer.

#### 6.4.3.3.4 Walk-throughs

The purpose of a walk-through is to evaluate a software product. A walk-through may be conducted for the purpose of educating an audience regarding a software product. The major objectives are to:

- Find anomalies
- Improve the software product
- Consider alternative implementations
- Evaluate conformance to standards and specifications

The walk-through is similar to an inspection but is typically conducted less formally. The walk-through is primarily organized by the software engineer to give his teammates the opportunity to review his work, as an assurance technique.

#### 6.4.3.3.5 Audits

The purpose of a software audit is to provide an independent evaluation of the conformance of software products and processes to applicable regulations, standards, guidelines, plans, and procedures. The audit is a formally organized activity, with participants having specific roles, such as lead auditor, another auditor, a recorder, or an initiator, and includes a representative of the audited organization. The audit will identify instances of nonconformance and produce a report requiring the team to take corrective action.

While there may be many formal names for reviews and audits such as those identified in the standard (see IEEE1028- 97), the important point is that they can occur on almost any product at any stage of the development or maintenance process.

## 6.4.4 Practical Considerations

### 6.4.4.1 Software Quality Requirements

#### 6.4.4.1.1 Influence factors

Various factors influence planning, management, and selection of SQM activities and techniques, including:

- The domain of the system in which the software will reside (safety-critical, mission-critical, business-critical)
- System and software requirements
- The commercial (external) or standard (internal) components to be used in the system
- The specific software engineering standards applicable
- The methods and software tools to be used for development and maintenance and for quality evaluation and improvement
- The budget, staff, project organization, plans, and scheduling of all the processes
- The intended users and use of the system
- The integrity level of the system

Information on these factors influences how the SQM processes are organized and documented, how specific SQM activities are selected, what resources are needed, and which will impose bounds on the efforts.

#### 6.4.4.1.2 Dependability

In cases where system failure may have extremely severe consequences, overall dependability (hardware, software, and human) is the main quality requirement over and above basic functionality. Software dependability includes such characteristics as fault tolerance, safety, security, and usability. Reliability is also a criterion which can be defined in terms of dependability (ISO9126).

The body of literature for systems must be highly dependable (“high confidence” or “high integrity systems”). Terminology for traditional mechanical and electrical systems which may not include software has been imported for discussing threats or hazards, risks, system integrity, and related concepts, and may be found in the references cited for this section.

#### 6.4.4.1.3 Integrity levels of software

The integrity level is determined based on the possible consequences of failure of the software and the probability of failure. For software in which safety or security is important, techniques such as hazard analysis for safety or threat analysis for security may be used to develop a planning activity which would identify where potential trouble spots lie. The failure history of similar software may also help in identifying which techniques will be most useful in detecting faults and assessing quality.

### 6.4.4.2 Defect Characterization

SQM processes find defects. Characterizing those defects leads to an understanding of the product, facilitates corrections to the process or the product, and informs project management or the customer of the status of the process or product. Many defect (fault) taxonomies exist, and, while attempts have been made to gain consensus on a fault and failure taxonomy, the literature indicates. Defect (anomaly) characterization is also used in audits and reviews, with the review leader often presenting a list of anomalies provided by team members for consideration at a review meeting.

As new design methods and languages evolve, along with advances in overall software technologies, new classes of defects appear, and a great deal of effort is required to interpret previously defined classes. When tracking defects, the software engineer is interested in not only the number of defects but also the types. Information alone, without some classification, is not really of any use in identifying the underlying causes of the defects, since specific types of problems need to be grouped together in order for determinations to be

made about them. The point is to establish a defect taxonomy that is meaningful to the organization and to the software engineers.

SQM discovers information at all stages of software development and maintenance. Typically, where the word “defect” is used, it refers to a “fault” as defined below. However, different cultures and standards may use somewhat different meanings for these terms, which have led to attempts to define them. Partial definitions taken from standard (IEEE610.12-90) are:

- Error: “A difference...between a computed result and the correct result”
- Fault: “An incorrect step, process, or data definition in a computer program”
- Failure: “The [incorrect] result of a fault”
- Mistake: “A human action that produces an incorrect result”
- Failures found in testing as a result of software faults are included as defects in the discussion in this section. Reliability models are built from failure data collected during software testing or from software in service, and thus can be used to predict future failures and to assist in decisions on when to stop testing.

One probable action resulting from SQM findings is to remove the defects from the product under examination. Other actions enable the achievement of full value from the findings of SQM activities. These actions include analyzing and summarizing the findings, and using measurement techniques to improve the product and the process as well as to track the defects and their removal.

Data on the inadequacies and defects found during the implementation of SQM techniques may be lost unless they are recorded. For some techniques (for example, technical reviews, audits, inspections), recorders are present to set down such information, along with issues and decisions. When automated tools are used, the tool output may provide the defect information. Data about defects may be collected and recorded on an SCR (software change request) form and may subsequently be entered into some type of database, either manually or automatically, from an analysis tool. Reports about defects are provided to the management of the organization.

#### **6.4.4.3 Software Quality Management Techniques**

SQM techniques can be categorized in many ways: static, people-intensive, analytical, dynamic.

##### **6.4.4.3.1 Static techniques**

Static techniques involve examination of the project documentation and software, and other information about the software products, without executing them. These techniques may include people-intensive activities or analytical activities conducted by individuals, with or without the assistance of automated tools.

##### **6.4.4.3.2 People-intensive techniques**

The setting for people-intensive techniques, including reviews and audits, may vary from a formal meeting to an informal gathering or a desk-check situation, but (usually, at least) two or more people are involved. Preparation ahead of time may be necessary. Resources other than the items under examination may include checklists and results from analytical techniques and testing. These activities are discussed in (IEEE1028-97) on reviews and audits.

##### **6.4.4.3.3 Analytical techniques**

A software engineer generally applies analytical techniques. Sometimes several software engineers use the same technique, but each applies it to different parts of the product. Some techniques are tool-driven; others are manual. Some may find defects directly, but they are typically used to support other techniques. Some also include various assessments as part of overall quality analysis. Examples of such techniques include complexity analysis, control flow analysis, and algorithmic analysis.



Each type of analysis has a specific purpose, and not all types are applied to every project. An example of a support technique is complexity analysis, which is useful for determining whether or not the design or implementation is too complex to develop correctly, to test, or to maintain. The results of a complexity analysis may also be used in developing test cases. Defect-finding techniques, such as control flow analysis, may also be used to support another activity. For software with many algorithms, algorithmic analysis is important, especially when an incorrect algorithm could cause a catastrophic result. There are too many analytical techniques to list them all here. The list and references provided may offer insights into the selection of a technique, as well as suggestions for further reading.

Other, more formal, types of analytical techniques are known as formal methods. They are used to verify software requirements and designs. Proof of correctness applies to critical parts of software. They have mostly been used in the verification of crucial parts of critical systems, such as specific security and safety requirements.

#### 6.4.4.3.4 Dynamic techniques

Different kinds of dynamic techniques are performed throughout the development and maintenance of software. Generally, these are testing techniques, but techniques such as simulation, model checking, and symbolic execution may be considered dynamic. Code reading is considered a static technique, but experienced software engineers may execute the code as they read through it. In this sense, code reading may also qualify as a dynamic technique. This discrepancy in categorizing indicates that people with different roles in the organization may consider and apply these techniques differently.

Some testing may thus be performed in the development process, SQA process, or V&V process, again depending on project organization. Because SQM plans address testing, this section includes some comments on testing.

#### 6.4.4.3.5 Testing

The assurance processes described in SQA and V&V examine every output relative to the software requirement specification to ensure the output's traceability, consistency, completeness, correctness, and performance. This confirmation also includes the outputs of the development and maintenance processes, collecting, analyzing, and measuring the results. SQA ensures that appropriate types of tests are planned, developed, and implemented, and V&V develops test plans, strategies, cases, and procedures.

Two types of testing may fall under the headings SQA and V&V, because of their responsibility for the quality of the materials used in the project:

- Evaluation and test of tools to be used on the project (IEEE1462-98)
- Conformance test (or review of conformance test) of components and COTS products to be used in the product; there now exists a standard for software packages (IEEE1465-98)

Sometimes an independent V&V organization may be asked to monitor the test process and sometimes to witness the actual execution to ensure that it is conducted in accordance with specified procedures. Again, V&V may be called upon to evaluate the testing itself: adequacy of plans and procedures, and adequacy and accuracy of results.

Another type of testing that may fall under the heading of V&V organization is third-party testing. The third party is not the developer, nor is in any way associated with the development of the product. Instead, the third party is an independent facility, usually accredited by some body of authority. Their purpose is to test a product for conformance to a specific set of requirements.

#### 6.4.4.4 Software Quality Measurement

The models of software product quality often include measures to determine the degree of each quality characteristic attained by the product.

If they are selected properly, measures can support software quality (among other aspects of the software life cycle processes) in multiple ways. They can help in the management decision-making process. They can find problematic areas and bottlenecks in the software process; and they can help the software engineers assess the quality of their work for SQA purposes and for longer-term process quality improvement.

With the increasing sophistication of software, questions of quality go beyond whether or not the software works to how well it achieves measurable quality goals.

There are a few more topics where measurement supports SQM directly. These include assistance in deciding when to stop testing. For this, reliability models and benchmarks, both using fault and failure data, are useful.

The cost of SQM processes is an issue which is almost always raised in deciding how a project should be organized. Often, generic models of cost are used, which are based on when a defect is found and how much effort it takes to fix the defect relative to finding the defect earlier in the development process. Project data may give a better picture of cost.

Finally, the SQM reports themselves provide valuable information not only on these processes, but also on how all the software life cycle processes can be improved.

While the measures for quality characteristics and product features may be useful in themselves (for example, the number of defective requirements or the proportion of defective requirements), mathematical and graphical techniques can be applied to aid in the interpretation of the measures. These fit into the following categories:

- Statistically based (for example, Pareto analysis, runcharts, scatter plots, normal distribution)
- Statistical tests (for example, the binomial test, chi-squared test)
- Trend analysis
- Prediction (for example, reliability models)

The statistically based techniques and tests often provide a snapshot of the more troublesome areas of the software product under examination. The resulting charts and graphs are visualization aids which the decision-makers can use to focus resources where they appear most needed. Results from trend analysis may indicate that a schedule has not been respected, such as in testing, or that certain classes of faults will become more intense unless some corrective action is taken in development. The predictive techniques assist in planning test time and in predicting failure.

References:

[http://en.wikipedia.org/wiki/Software\\_quality\\_assurance](http://en.wikipedia.org/wiki/Software_quality_assurance), <http://ocw.mit.edu/OcwWeb/Electrical-Engineering-and-Computer-Science/6-171Fall2003/CourseHome/>, <http://www.cs.cornell.edu/courses/cs501/2008sp/>, <http://www.comp.lancs.ac.uk/computing/resources/IanS/SE7/>, <http://www.ee.umb.ca/kengleha/courses/CMPE3213/Intro5>, [http://www.softwarecertifications.org/qai\\_cmsq.htm](http://www.softwarecertifications.org/qai_cmsq.htm), <http://satc.gsfc.nasa.gov/assure/agbsec3.txt>, etc...

## 6.5 Software configuration management<sup>8</sup>

### 6.5.1 Introduction

A system can be defined as a collection of components organized to accomplish a specific function or set of functions. The configuration of a system is the functional and/or physical characteristics of hardware, firmware, or software, or a combination of these, as set forth in technical documentation and achieved in a product. It can also be thought of as a collection of specific versions of hardware, firmware, or software items combined according to specific build procedures to serve a particular purpose. Configuration management (CM), then, is the discipline of identifying the configuration of a system at distinct points in time for the purpose of systematically controlling changes to the configuration, and maintaining the integrity and traceability of the configuration throughout the system life cycle. It is formally defined as “A discipline applying technical and administrative direction and surveillance to: identify and document the functional

<sup>8</sup>This content is available online at <<http://cnx.org/content/m14730/1.1/>>.

and physical characteristics of a configuration item, control changes to those characteristics, record and report change processing and implementation status, and verify compliance with specified requirements.”

Software configuration management (SCM) is a critical element of software engineering.

Unfortunately, in practice it is often ignored until absolutely necessary. It may be introduced at first customer release, possibly through customer pressure. Tool support for SCM is limited in that only certain aspects of software development and maintenance are accommodated. SCM methods and tools are often viewed as intrusive by developers, a management tool that imposes additional work with little perceived benefit to the tasks of the developer.

Software configuration management (SCM) is a supporting software life cycle process which benefits project management, development and maintenance activities, assurance activities, and the customers and users of the end product.

The concepts of configuration management apply to all items to be controlled, although there are some differences in implementation between hardware CM and software CM.

SCM is closely related to the software quality assurance (SQA) activity. SQA processes provide assurance that the software products and processes in the project life cycle conform to their specified requirements by planning, enacting, and performing a set of activities to provide adequate confidence that quality is being built into the software. SCM activities help in accomplishing these SQA goals.

The SCM activities are: management and planning of the SCM process, software configuration identification, software configuration control, software configuration status accounting, software configuration auditing, and software release management and delivery.

The figure following shows a stylized representation of these activities:

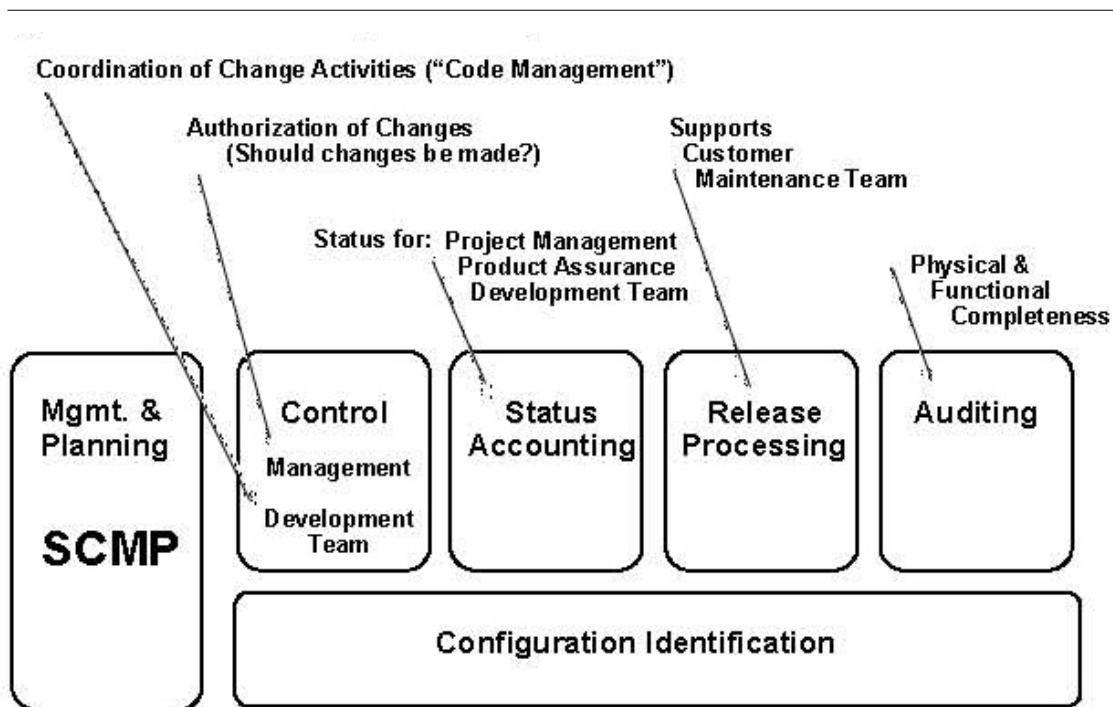


Figure 6.7

## 6.5.2 Management of the SCM Process

SCM controls the evolution and integrity of a product by identifying its elements, managing and controlling change, and verifying, recording, and reporting on configuration information. From the software engineer's perspective, SCM facilitates development and change implementation activities. A successful SCM implementation requires careful planning and management. This, in turn, requires an understanding of the organizational context for, and the constraints placed on, the design and implementation of the SCM process.

### 6.5.2.1 Organizational Context for SCM

To plan an SCM process for a project, it is necessary to understand the organizational context and the relationships among the organizational elements. SCM interacts with several other activities or organizational elements.

The organizational elements responsible for the software engineering supporting processes may be structured in various ways. Although the responsibility for performing certain SCM tasks might be assigned to other parts of the organization such as the development organization, the overall responsibility for SCM often rests with a distinct organizational element or designated individual.

Software is frequently developed as part of a larger system containing hardware and firmware elements. In this case, SCM activities take place in parallel with hardware and firmware CM activities, and must be consistent with system-level CM. Buckley describes SCM within this context. Note that firmware contains hardware and software, therefore both hardware and software CM concepts are applicable.

SCM might interface with an organization's quality assurance activity on issues such as records management and non-conforming items. Regarding the former, some items under SCM control might also be project records subject to provisions of the organization's quality assurance program. Managing nonconforming items is usually the responsibility of the quality assurance activity; however, SCM might assist with tracking and reporting on software configuration items falling into this category.

Perhaps the closest relationship is with the software development and maintenance organizations.

It is within this context that many of the software configuration control tasks are conducted. Frequently, the same tools support development, maintenance, and SCM purposes.

### 6.5.2.2 Constraints and Guidance for the SCM Process

Constraints affecting, and guidance for, the SCM process come from a number of sources. Policies and procedures set forth at corporate or other organizational levels might influence or prescribe the design and implementation of the SCM process for a given project. In addition, the contract between the acquirer and the supplier might contain provisions affecting the SCM process. For example, certain configuration audits might be required, or it might be specified that certain items be placed under CM. When software products to be developed have the potential to affect public safety, external regulatory bodies may impose constraints. Finally, the particular software life cycle process chosen for a software project and the tools selected to implement the software affect the design and implementation of the SCM process.

Guidance for designing and implementing an SCM process can also be obtained from "best practice," as reflected in the standards on software engineering issued by the various standards organizations. Moore provides a roadmap to these organizations and their standards. Best practice is also reflected in process improvement and process assessment models such as the Software Engineering Institute's Capability Maturity Model Integration (SEI/CMMI) and ISO/IEC15504 Software Engineering-Process Assessment (ISO/IEC 15504-98).

### 6.5.2.3 Planning for SCM

The planning of an SCM process for a given project should be consistent with the organizational context, applicable constraints, commonly accepted guidance, and the nature of the project (for example, size and criticality). The major activities covered are: Software Configuration Identification, Software Configuration Control, Software Configuration Status Accounting, Software Configuration Auditing, and Software Release

Management and Delivery. In addition, issues such as organization and responsibilities, resources and schedules, tool selection and implementation, vendor and subcontractor control, and interface control are typically considered. The results of the planning activity are recorded in an SCM Plan (SCMP), which is typically subject to SQA review and audit.

#### **6.5.2.3.1 SCM organization and responsibilities**

To prevent confusion about who will perform given SCM activities or tasks, organizations to be involved in the SCM process need to be clearly identified. Specific responsibilities for given SCM activities or tasks also need to be assigned to organizational entities, either by title or by organizational element. The overall authority and reporting channels for SCM should also be identified, although this might be accomplished at the project management or quality assurance planning stage.

#### **6.5.2.3.2 SCM resources and schedules**

Planning for SCM identifies the staff and tools involved in carrying out SCM activities and tasks. It addresses scheduling questions by establishing necessary sequences of SCM tasks and identifying their relationships to the project schedules and milestones established at the project management planning stage. Any training requirements necessary for implementing the plans and training new staff members are also specified.

#### **6.5.2.3.3 Tool selection and implementation**

Different types of tool capabilities, and procedures for their use, support SCM activities. Depending on the situation, these tool capabilities can be made available with some combination of manual tools, automated tools providing a single SCM capability, automated tools integrating a range of SCM (and perhaps other) capabilities, or integrated tool environments which serve the needs of multiple participants in the software engineering process (for example, SCM, development, V&V). Automated tool support becomes increasingly important, and increasingly difficult to establish, as projects grow in size and as project environments become more complex. These tool capabilities provide support for:

- the SCM Library
- the software change request (SCR) and approval procedures
- code (and related work products) and change management tasks
- reporting software configuration status and collecting SCM measurements
- software configuration auditing
- managing and tracking software documentation
- performing software builds
- managing and tracking software releases and their delivery

The tools used in these areas can also provide measurements for process improvement. Royce describes seven core measures of value in managing software engineering processes. Information available from the various SCM tools relates to Royce's Work and Progress management indicator and to his quality indicators of Change Traffic and Stability, Breakage and Modularity, Rework and Adaptability, and MTBF (mean time between failures) and Maturity. Reporting on these indicators can be organized in various ways, such as by software configuration item or by type of change requested.

We can represent a mapping of tool capabilities and procedures to SCM Activities:

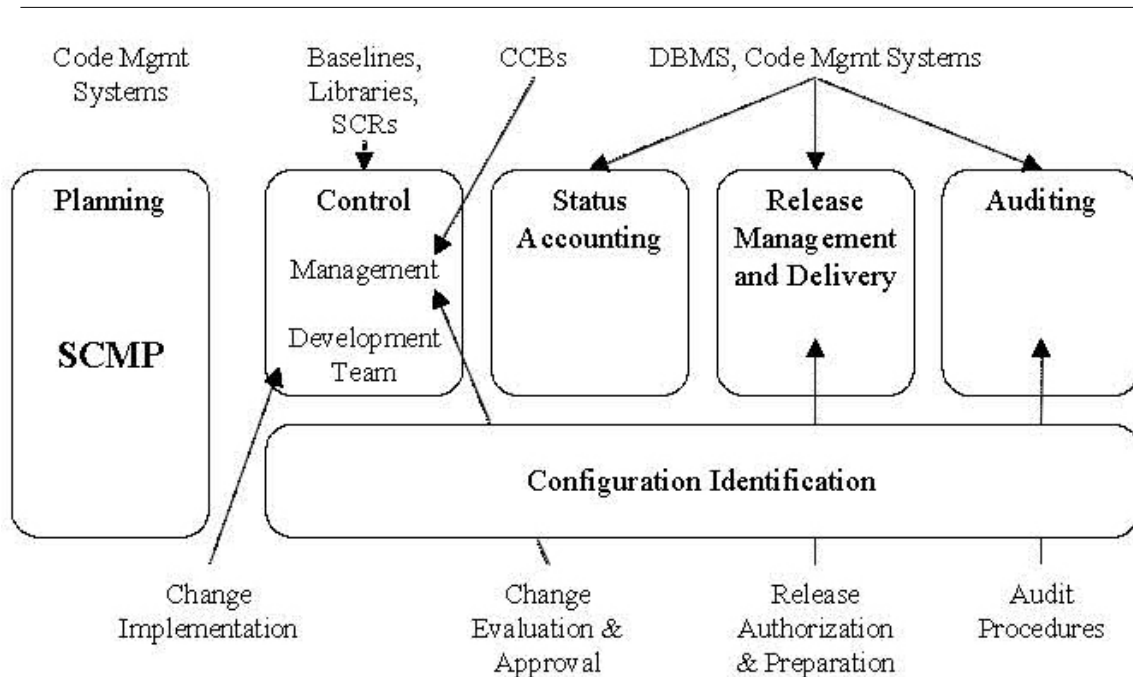


Figure 6.8

In this example, code management systems support the operation of software libraries by controlling access to library elements, coordinating the activities of multiple users, and helping to enforce operating procedures. Other tools support the process of building software and release documentation from the software elements contained in the libraries. Tools for managing software change requests support the change control procedures applied to controlled software items. Other tools can provide database management and reporting capabilities for management, development, and quality assurance activities. As mentioned above, the capabilities of several tool types might be integrated into SCM systems, which in turn are closely coupled to various other software activities.

In planning, the software engineer picks SCM tools fit for the job. Planning considers issues that might arise in the implementation of these tools, particularly if some form of culture change is necessary.

#### 6.5.2.3.4 Vendor/Subcontractor Control

A software project might acquire or make use of purchased software products, such as compilers or other tools. SCM planning considers if and how these items will be taken under configuration control (for example, integrated into the project libraries) and how changes or updates will be evaluated and managed.

Similar considerations apply to subcontracted software. In this case, the SCM requirements to be imposed on the subcontractor's SCM process as part of the subcontract and the means for monitoring compliance also need to be established. The latter includes consideration of what SCM information must be available for effective compliance monitoring.

#### 6.5.2.3.5 Interface control

When a software item will interface with another software or hardware item, a change to either item can affect the other. The planning for the SCM process considers how the interfacing items will be identified

and how changes to the items will be managed and communicated. The SCM role may be part of a larger, system-level process for interface specification and control, and may involve interface specifications, interface control plans, and interface control documents. In this case, SCM planning for interface control takes place within the context of the system-level process.

#### **6.5.2.4 SCM Plan**

The results of SCM planning for a given project are recorded in a Software Configuration Management Plan (SCMP), a “living document” which serves as a reference for the SCM process. It is maintained (that is, updated and approved) as necessary during the software life cycle. In implementing the SCMP, it is typically necessary to develop a number of more detailed, subordinate procedures defining how specific requirements will be carried out during day-to-day activities.

Guidance on the creation and maintenance of an SCMP, based on the information produced by the planning activity, is available from a number of sources, such as IEEE828-98. This reference provides requirements for the information to be contained in an SCMP. It also defines and describes six categories of SCM information to be included in an SCMP:

- Introduction (purpose, scope, terms used)
- SCM Management (organization, responsibilities, authorities, applicable policies, directives, and procedures)
- SCM Activities (configuration identification, configuration control, and so on)
- SCM Schedules (coordination with other project activities)
- SCM Resources (tools, physical resources, and humanresources)
- SCMP Maintenance

#### **6.5.2.5 Surveillance of Software Configuration Management**

After the SCM process has been implemented, some degree of surveillance may be necessary to ensure that the provisions of the SCMP are properly carried out. There are likely to be specific SQA requirements for ensuring compliance with specified SCM processes and procedures. This could involve an SCM authority ensuring that those with the assigned responsibility perform the defined SCM tasks correctly. The software quality assurance authority, as part of a compliance auditing activity, might also perform this surveillance.

The use of integrated SCM tools with process control capability can make the surveillance task easier. Some tools facilitate process compliance while providing flexibility for the software engineer to adapt procedures. Other tools enforce process, leaving the software engineer with less flexibility. Surveillance requirements and the level of flexibility to be provided to the software engineer are important considerations in tool selection.

##### **6.5.2.5.1 SCM measures and measurement**

SCM measures can be designed to provide specific information on the evolving product or to provide insight into the functioning of the SCM process. A related goal of monitoring the SCM process is to discover opportunities for process improvement. Measurements of SCM processes provide a good means for monitoring the effectiveness of SCM activities on an ongoing basis. These measurements are useful in characterizing the current state of the process, as well as in providing a basis for making comparisons over time. Analysis of the measurements may produce insights leading to process changes and corresponding updates to the SCMP.

Software libraries and the various SCM tool capabilities provide sources for extracting information about the characteristics of the SCM process (as well as providing project and management information). For example, information about the time required to accomplish various types of changes would be useful in an evaluation of the criteria for determining what levels of authority are optimal for authorizing certain types of changes.

Care must be taken to keep the focus of the surveillance on the insights that can be gained from the measurements, not on the measurements themselves.

#### **6.5.2.5.2 In-process audits of SCM**

Audits can be carried out during the software engineering process to investigate the current status of specific elements of the configuration or to assess the implementation of the SCM process. In-process auditing of SCM provides a more formal mechanism for monitoring selected aspects of the process and may be coordinated with the SQA function.

### **6.5.3 Software Configuration Identification**

The software configuration identification activity identifies items to be controlled, establishes identification schemes for the items and their versions, and establishes the tools and techniques to be used in acquiring and managing controlled items. These activities provide the basis for the other SCM activities.

#### **6.5.3.1 Identifying Items to Be Controlled**

A first step in controlling change is to identify the software items to be controlled. This involves understanding the software configuration within the context of the system configuration, selecting software configuration items, developing a strategy for labeling software items and describing their relationships, and identifying the baselines to be used, along with the procedure for a baseline's acquisition of the items.

##### **6.5.3.1.1 Software configuration**

A software configuration is the set of functional and physical characteristics of software as set forth in the technical documentation or achieved in a product. It can be viewed as a part of an overall system configuration.

##### **6.5.3.1.2 Software configuration item**

A software configuration item (SCI) is an aggregation of software designated for configuration management and is treated as a single entity in the SCM process. A variety of items, in addition to the code itself, is typically controlled by SCM. Software items with potential to become SCIs include plans, specifications and design documentation, testing materials, software tools, source and executable code, code libraries, data and data dictionaries, and documentation for installation, maintenance, operations, and software use.

Selecting SCIs is an important process in which a balance must be achieved between providing adequate visibility for project control purposes and providing a manageable number of controlled items.

##### **6.5.3.1.3 Software configuration item relationships**

The structural relationships among the selected SCIs, and their constituent parts, affect other SCM activities or tasks, such as software building or analyzing the impact of proposed changes. Proper tracking of these relationships is also important for supporting traceability. The design of the identification scheme for SCIs should consider the need to map the identified items to the software structure, as well as the need to support the evolution of the software items and their relationships.

##### **6.5.3.1.4 Software version**

Software items evolve as a software project proceeds. A version of a software item is a particular identified and specified item. It can be thought of as a state of an evolving item. A revision is a new version of an item that is intended to replace the old version of the item. A variant is a new version of an item that will be added to the configuration without replacing the old version.



#### **6.5.3.1.5 Baseline**

A software baseline is a set of software configuration items formally designated and fixed at a specific time during the software life cycle. The term is also used to refer to a particular version of a software configuration item that has been agreed on. In either case, the baseline can only be changed through formal change control procedures. A baseline, together with all approved changes to the baseline, represents the current approved configuration.

Commonly used baselines are the functional, allocated, developmental, and product baselines. The functional baseline corresponds to the reviewed system requirements. The allocated baseline corresponds to the reviewed software requirements specification and software interface requirements specification. The developmental baseline represents the evolving software configuration at selected times during the software life cycle. Change authority for this baseline typically rests primarily with the development organization, but may be shared with other organizations (for example, SCM or Test). The product baseline corresponds to the completed software product delivered for system integration. The baselines to be used for a given project, along with their associated levels of authority needed for change approval, are typically identified in the SCMP.

#### **6.5.3.1.6 Acquiring software configuration items**

Software configuration items are placed under SCM control at different times; that is, they are incorporated into a particular baseline at a particular point in the software life cycle. The triggering event is the completion of some form of formal acceptance task, such as a formal review.

This is an acquisition of items:

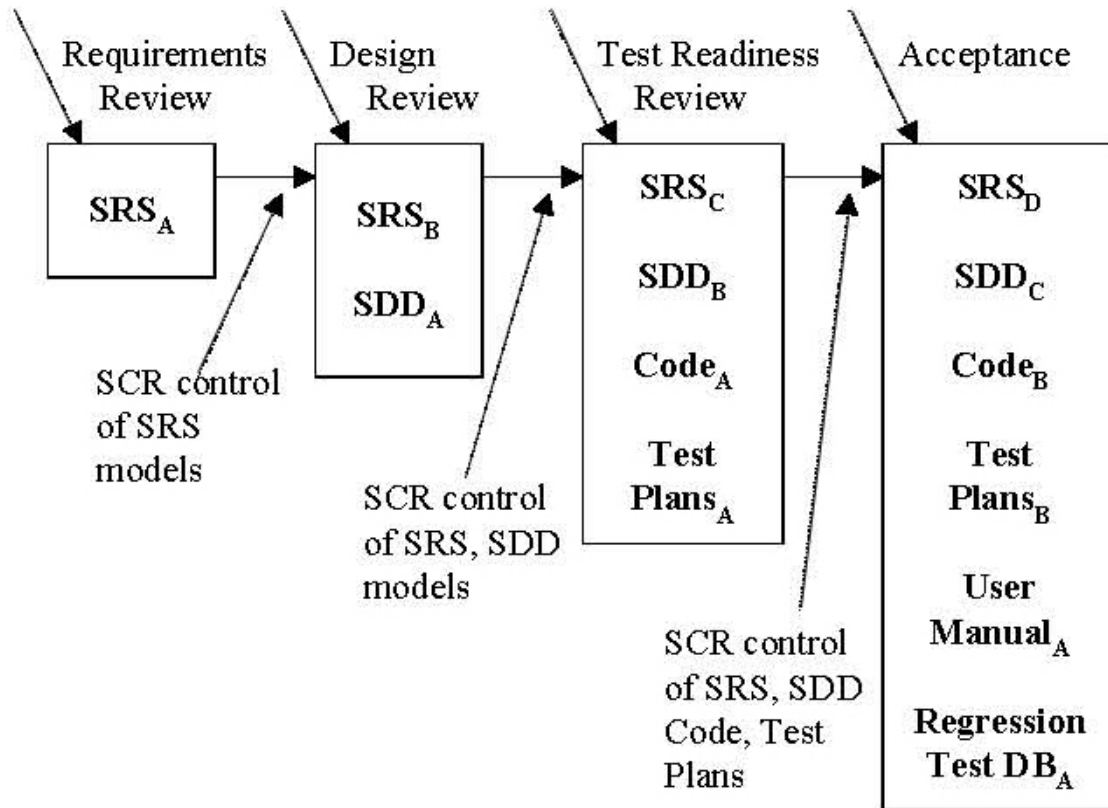


Figure 6.9

Following the acquisition of an SCI, changes to the item must be formally approved as appropriate for the SCI and the baseline involved, as defined in the SCMP. Following approval, the item is incorporated into the software baseline according to the appropriate procedure.

### 6.5.3.2 Software Library

A software library is a controlled collection of software and related documentation designed to aid in software development, use, and maintenance. It is also instrumental in software release management and delivery activities. Several types of libraries might be used, each corresponding to a particular level of maturity of the software item. For example, a working library could support coding and a project support library could support testing, while a master library could be used for finished products. An appropriate level of SCM control (associated baseline and level of authority for change) is associated with each library. Security, in terms of access control and the backup facilities, is a key aspect of library management.

The tool(s) used for each library must support the SCM control needs for that library, both in terms of controlling SCIs and controlling access to the library. At the working library level, this is a code management capability serving developers, maintainers, and SCM. It is focused on managing the versions of software items while supporting the activities of multiple developers. At higher levels of control, access is more restricted and SCM is the primary user.

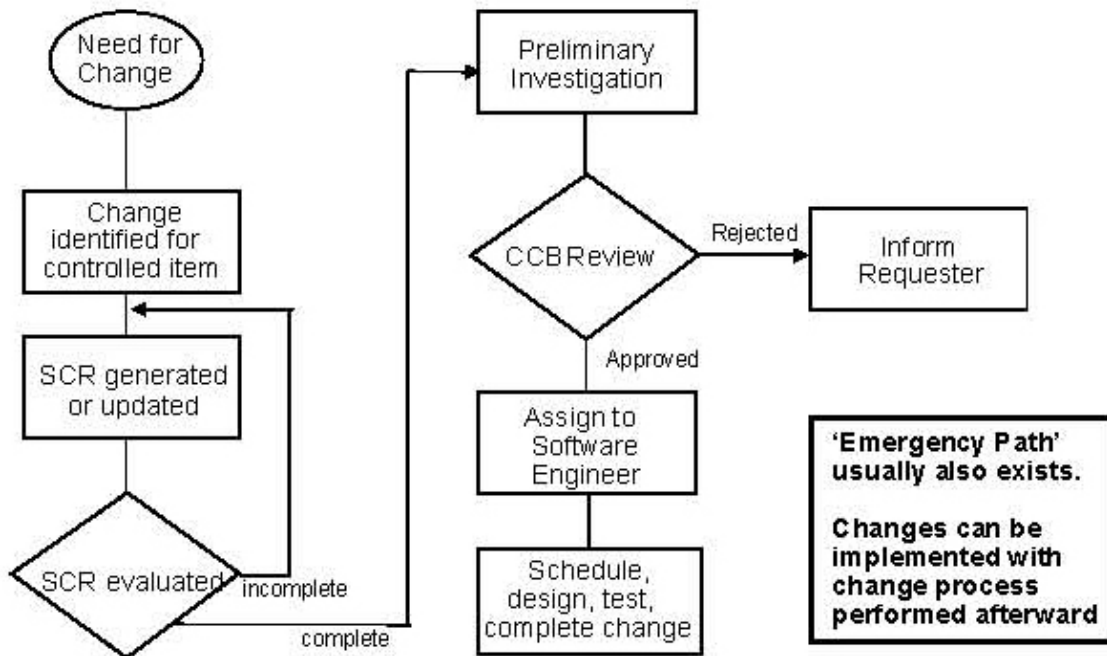
These libraries are also an important source of information for measurements of work and progress.

## 6.5.4 Software Configuration Control

Software configuration control is concerned with managing changes during the software life cycle. It covers the process for determining what changes to make, the authority for approving certain changes, support for the implementation of those changes, and the concept of formal deviations from project requirements, as well as waivers of them. Information derived from these activities is useful in measuring change traffic and breakage, and aspects of rework.

### 6.5.4.1 Requesting, Evaluating, and Approving Software Changes

The first step in managing changes to controlled items is determining what changes to make. The software change request process provides formal procedures for submitting and recording change requests, evaluating the potential cost and impact of a proposed change, and accepting, modifying, or rejecting the proposed change. Requests for changes to software configuration items may be originated by anyone at any point in the software life cycle and may include a suggested solution and requested priority. One source of change requests is the initiation of corrective action in response to problem reports. Regardless of the source, the type of change (for example, defect or enhancement) is usually recorded on the SCR.



This flow of a Change Control Process provides an opportunity for tracking defects and collecting change activity measurements by change type. Once an SCR is received, a technical evaluation (also known as an impact analysis) is performed to determine the extent of the modifications that would be necessary should the change request be accepted. A good understanding of the relationships among software (and possibly, hardware) items is important for this task. Finally, an established authority, commensurate with the affected baseline, the SCI involved, and the nature of the change, will evaluate the technical and managerial aspects of the change request and either accept, modify, reject, or defer the proposed change.

#### 6.5.4.1.1 Software Configuration Control Board

The authority for accepting or rejecting proposed changes rests with an entity typically known as a Configuration Control Board (CCB). In smaller projects, this authority may actually reside with the leader or an assigned individual rather than a multi-person board. There can be multiple levels of change authority depending on a variety of criteria, such as the criticality of the item involved, the nature of the change (for

example, impact on budget and schedule), or the current point in the life cycle. The composition of the CCBs used for a given system varies depending on these criteria (an SCM representative would always be present). All stakeholders, appropriate to the level of the CCB, are represented. When the scope of authority of a CCB is strictly software, it is known as a Software Configuration Control Board (SCCB). The activities of the CCB are typically subject to software quality audit or review.

#### **6.5.4.1.2 Software change request process**

An effective software change request (SCR) process requires the use of supporting tools and procedures ranging from paper forms and a documented procedure to an electronic tool for originating change requests, enforcing the flow of the change process, capturing CCB decisions, and reporting change process information. A link between this tool capability and the problem-reporting system can facilitate the tracking of solutions for reported problems. Change process descriptions and supporting forms (information) are given in a variety of references.

#### **6.5.4.2 Implementing Software Changes**

Approved SCRs are implemented using the defined software procedures in accordance with the applicable schedule requirements. Since a number of approved SCRs might be implemented simultaneously, it is necessary to provide a means for tracking which SCRs are incorporated into particular software versions and baselines. As part of the closure of the change process, completed changes may undergo configuration audits and software quality verification. This includes ensuring that only approved changes have been made. The change request process described above will typically document the SCM (and other) approval information for the change.

The actual implementation of a change is supported by the library tool capabilities, which provide version management and code repository support. At a minimum, these tools provide check-in/out and associated version control capabilities. More powerful tools can support parallel development and geographically distributed environments. These tools may be manifested as separate specialized applications under the control of an independent SCM group. They may also appear as an integrated part of the software engineering environment. Finally, they may be as elementary as a rudimentary change control system provided with an operating system.

#### **6.5.4.3 Deviations and Waivers**

The constraints imposed on a software engineering effort or the specifications produced during the development activities might contain provisions which cannot be satisfied at the designated point in the life cycle. A deviation is an authorization to depart from a provision prior to the development of the item. A waiver is an authorization to use an item, following its development, that departs from the provision in some way. In these cases, a formal process is used for gaining approval for deviations from, or waivers of, the provisions.

### **6.5.5 Software Configuration Status Accounting**

Software configuration status accounting (SCSA) is the recording and reporting of information needed for effective management of the software configuration.

#### **6.5.5.1 Software Configuration Status Information**

The SCSA activity designs and operates a system for the capture and reporting of necessary information as the life cycle proceeds. As in any information system, the configuration status information to be managed for the evolving configurations must be identified, collected, and maintained. Various information and measurements are needed to support the SCM process and to meet the configuration status reporting needs of management, software engineering, and other related activities. The types of information available include

the approved configuration identification, as well as the identification and current implementation status of changes, deviations, and waivers.

Some form of automated tool support is necessary to accomplish the SCSA data collection and reporting tasks. This could be a database capability, or it could be a standalone tool or a capability of a larger, integrated tool environment.

#### **6.5.5.2 Software Configuration Status Reporting**

Reported information can be used by various organizational and project elements, including the development team, the maintenance team, project management, and software quality activities. Reporting can take the form of ad hoc queries to answer specific questions or the periodic production of predesigned reports. Some information produced by the status accounting activity during the course of the life cycle might become quality assurance records.

In addition to reporting the current status of the configuration, the information obtained by the SCSA can serve as a basis for various measurements of interest to management, development, and SCM. Examples include the number of change requests per SCI and the average time needed to implement a change request.

### **6.5.6 Software Configuration Auditing**

A software audit is an activity performed to independently evaluate the conformance of software products and processes to applicable regulations, standards, guidelines, plans, and procedures. Audits are conducted according to a well-defined process consisting of various auditor roles and responsibilities. Consequently, each audit must be carefully planned. An audit can require a number of individuals to perform a variety of tasks over a fairly short period of time. Tools to support the planning and conduct of an audit can greatly facilitate the process.

The software configuration auditing activity determines the extent to which an item satisfies the required functional and physical characteristics. Informal audits of this type can be conducted at key points in the life cycle. Two types of formal audits might be required by the governing contract (for example, in contracts covering critical software): the Functional Configuration Audit (FCA) and the Physical Configuration Audit (PCA). Successful completion of these audits can be a prerequisite for the establishment of the product baseline. Buckley contrasts the purposes of the FCA and PCA in hardware versus software contexts, and recommends careful evaluation of the need for a software FCA and PCA before performing them.

#### **6.5.6.1 Software Functional Configuration Audit**

The purpose of the software FCA is to ensure that the audited software item is consistent with its governing specifications. The output of the software verification and validation activities is a key input to this audit.

#### **6.5.6.2 Software Physical Configuration Audit**

The purpose of the software physical configuration audit (PCA) is to ensure that the design and reference documentation is consistent with the as-built software product.

#### **6.5.6.3 In-process Audits of a Software Baseline**

As mentioned above, audits can be carried out during the development process to investigate the current status of specific elements of the configuration. In this case, an audit could be applied to sampled baseline items to ensure that performance is consistent with specifications or to ensure that evolving documentation continues to be consistent with the developing baseline item.

### 6.5.7 Software Release Management and Delivery

The term “release” is used in this context to refer to the distribution of a software configuration item outside the development activity. This includes internal releases as well as distribution to customers. When different versions of a software item are available for delivery, such as versions for different platforms or versions with varying capabilities, it is frequently necessary to recreate specific versions and package the correct materials for delivery of the version. The software library is a key element in accomplishing release and delivery tasks.

#### 6.5.7.1 Software Building

Software building is the activity of combining the correct versions of software configuration items, using the appropriate configuration data, into an executable program for delivery to a customer or other recipient, such as the testing activity. For systems with hardware or firmware, the executable program is delivered to the system-building activity. Build instructions ensure that the proper build steps are taken and in the correct sequence. In addition to building software for new releases, it is usually also necessary for SCM to have the capability to reproduce previous releases for recovery, testing, maintenance, or additional release purposes.

Software is built using particular versions of supporting tools, such as compilers. It might be necessary to rebuild an exact copy of a previously built software configuration item. In this case, the supporting tools and associated build instructions need to be under SCM control to ensure availability of the correct versions of the tools.

A tool capability is useful for selecting the correct versions of software items for a given target environment and for automating the process of building the software from the selected versions and appropriate configuration data. For large projects with parallel development or distributed development environments, this tool capability is necessary. Most software engineering environments provide this capability. These tools vary in complexity from requiring the software engineer to learn a specialized scripting language to graphics-oriented approaches that hide much of the complexity of an “intelligent” build facility.

The build process and products are often subject to software quality verification. Outputs of the build process might be needed for future reference and may become quality assurance records.

#### 6.5.7.2 Software Release Management

Software release management encompasses the identification, packaging, and delivery of the elements of a product, for example, executable program, documentation, release notes, and configuration data. Given that product changes can occur on a continuing basis, one concern for release management is determining when to issue a release. The severity of the problems addressed by the release and measurements of the fault densities of prior releases affect this decision. The packaging task must identify which product items are to be delivered, and then select the correct variants of those items, given the intended application of the product. The information documenting the physical contents of a release is known as a version description document. The release notes typically describe new capabilities, known problems, and platform requirements necessary for proper product operation. The package to be released also contains installation or upgrading instructions. The latter can be complicated by the fact that some current users might have versions that are several releases old. Finally, in some cases, the release management activity might be required to track the distribution of the product to various customers or target systems. An example would be a case where the supplier was required to notify a customer of newly reported problems.

A tool capability is needed for supporting these release management functions. It is useful to have a connection with the tool capability supporting the change request process in order to map release contents to the SCRs that have been received. This tool capability might also maintain information on various target platforms and on various customer environments.

## 6.6 Starting a new Web project<sup>9</sup>

### Before Beginning Website Construction

Before beginning development on a site it is important to be able to answer a few questions in order to understand what you need to be developing and why. Below I will offer my suggestions. My suggestions are based in part on the concepts of John December, who wrote *The World Wide Web Unleashed*; *HTML 3.2 and Cgi Unleashed*; and *Presenting Java*.

John December's methodology involves six sets of information called elements:

1. Audience information - a store of knowledge about the target audience for the web as well as the actual audience who uses the web.
2. Purpose statement - defines the reason for and scope of the web's existence.
3. Objectives list defines the specific goals the web should accomplish.
4. Domain information - a collection of knowledge and information about the subject domain the web covers.
5. Web specification - a detailed description of the constraints and elements that will go into the web.
6. Web presentation - the full description of the technical structures (hypertext and other media) by which the web is delivered to the users.

You can view more about John December at <http://www.december.com><sup>10</sup>.

### Steps to Take Before Beginning Construction

1. Determine who your audience is. Who are you building it to service? What are assumptions you make about this audience? When might members of the audience have conflicting needs? How many people do you hope to have hitting your site? Example: Our intended audience is students interested in distance education. They may be any age range although generally over 20 years old. They may be any gender and may come from anywhere in the United States. Some may come from overseas but we will focus on United States. They may or may not have disabilities such as sight impairment. They likely will have completed high school and are looking for options for continuing their education. We assume the user: 1) has familiarity with the Web; 2) is interested in pursuing additional education; 3) are looking to find out more about us and have found us either due to a search on distance education or by knowing our direct URL.
2. Determine the stakeholders. Determine who internally will be impacted by a new site. Discuss ways in which they could be impacted. Try to include members from each main stakeholder group in all discussions. Support from all stakeholder groups can make or break your project.
3. Determine your overall purpose for the site. This may or may not match the companies overall purpose, but should definitely complement the companies overall purpose. This should be a few sentences. Example: The purpose of our site is to disseminate information on courses and degrees offered at our institution
4. Determine your goals and objectives. Goals are basically from the viewpoint of the company and what you want to see happen, whereas objectives are commonly what you want the end user to end up doing. Example: Goal1: Inspire students to view our online list of courses and entice them to then register for a course Objective1: Have the end user go to our online list of courses and either register for a course or inquire for additional information
5. Evaluate your resources. Determine what type of manpower, machinery and budget you have to work with. Are there system limitations? Will you have maintainability issues (such as if contracting out)? What programmers do you have in house? What are their skills? What is their current workload?
6. Create a wish list of what you would like. Often creating this manner of a list is done in a brainstorming session. This should be done with members from various parts of the organization. Don't worry about limiting the list at this point. You may even end up with requests that directly conflict with one another based on the needs of different audiences or stakeholder groups.

<sup>9</sup>This content is available online at <<http://cnx.org/content/m15998/1.1/>>.

<sup>10</sup><http://www.december.com/>

7. Set priorities. Determine what on the wish list is a requirement and what is nice to have. Determine what your bare minimum would be, and then determine what you would incorporate in phases after that (level 2 requests, level 3 requests). Iron out problems with conflicting requests (such as whether or not to list prices)
8. Determine feasibility based on currently available resources.
9. Develop a "straw man". This is basically a mapped out diagram or text document showing what you envision and how you envision it being organized. Bear in mind that there are two types of structures: 1) what is visible to the end user and 2) what the structure is on the underlying system (where things are located physically for example), so you may want more than one document/chart. Also determine at this point what type of depth you are envisioning. How much detail will there be? How much will users be able to drill down? What parts would use multimedia or interactivity? Does this answer to your goals and objectives?
10. Create a detailed specification of what you want. The more precise and detailed you can be the better. This will be an offshoot of your "straw man" but will be written with the developers in mind so they know what you are looking for. It will also be to ensure that all stakeholders have the same view of what is being requested.
11. Determine who is responsible for what. Who will be responsible for the content development now and in the future? Who will be responsible for the actual coding? Who will maintain it? Who will address security concerns? Who will maintain the server? Who has final say where there is disagreement about content? Who does one go to if they experience problems or have questions? You may want to include this in your detailed specification.
12. Ensure all parties are in agreement to the detailed specification. Do developers agree it is feasible? If so, do they know how they will proceed? Does management agree with the structure and what will be presented? Do they agree with the anticipated sticker price?

Once you have completed the above steps you will be in a good position to begin building your first drafts of the framework. Remember before you start though and throughout the process to ensure you are keeping your primary goals and objectives in sight.

## 6.7 Flowcharting<sup>11</sup>

### 6.7.1 Flowcharting Symbols

#### 6.7.1.1 Terminal

The rounded rectangles, or terminal points, indicate the flowchart's starting and ending points.

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<sup>11</sup>This content is available online at <http://cnx.org/content/m19623/1.7/>.





**Figure 6.10**

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### **6.7.1.2 Process**

The rectangle depicts a process such as a mathematical computation, or a variable assignment.

Note: the C++ language equivalent is the statement.

---



**Figure 6.11**

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### **6.7.1.3 Input/Output**

The parallelograms designate input or output operations.

Note: the C++ language equivalent is cin or cout.

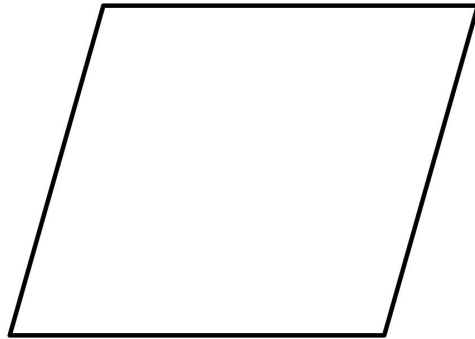


Figure 6.12

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#### 6.7.1.4 Connectors

Sometimes a flowchart is broken into two or more smaller flowcharts. This is usually done when a flowchart does not fit on a single page, or must be divided into sections. A connector symbol, which is a small circle with a letter or number inside it, allows you to connect two flowcharts on the same page. A connector symbol that looks like a pocket on a shirt, allows you to connect to a flowchart on a different page.

On-Page Connector

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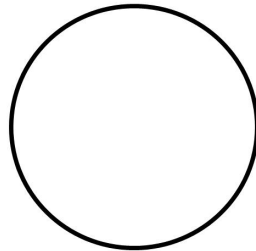


Figure 6.13

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Off-Page Connector

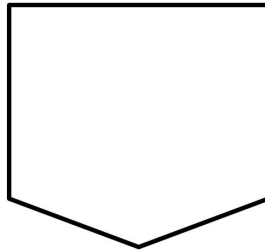


Figure 6.14

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#### 6.7.1.5 Decision

The diamond is used to represent the true/false statement being tested in a decision symbol.

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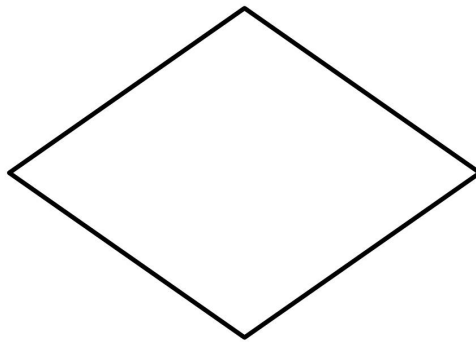


Figure 6.15

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#### 6.7.1.6 Module Call

A program module is represented in a flowchart by rectangle with some lines to distinguish it from process symbol. Often programmers will make a distinction between program control and specific task modules as shown below.

Note: C++ equivalent is the function.

Local module: usually a program control function.

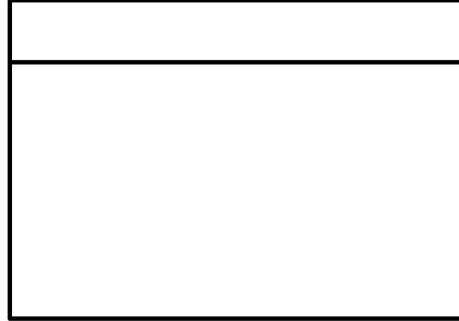


Figure 6.16

Library module: usually a specific task function.

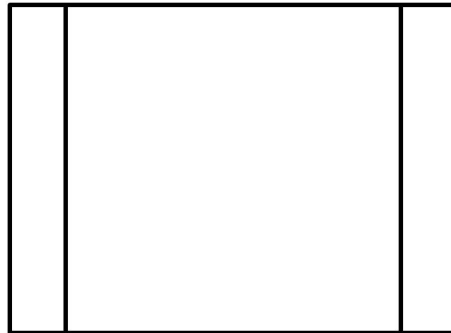


Figure 6.17

### 6.7.1.7 Flow Lines

Note: The default flow is left to right and top to bottom (the same way you read English). To save time arrowheads are often only drawn when the flow lines go contrary the normal.

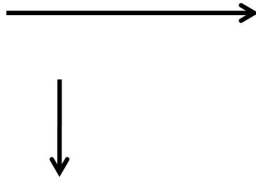


Figure 6.18

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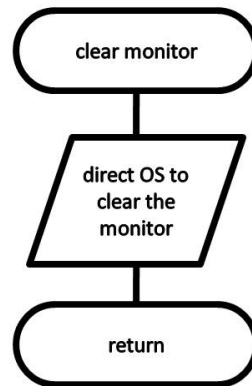
## 6.7.2 Examples

We will demonstrate various flowcharting items by showing the flowchart for some pseudocode.

### 6.7.2.1 Functions

#### Example 6.1: pseudocode: Function with no parameter passing

```
Function clear monitor
  Pass In: nothing
  Direct the operating system to clear the monitor
  Pass Out: nothing
Endfunction
```



**Figure 6.19:** Function clear monitor

**Example 6.2: pseudocode: Function main calling the clear monitor function**

```
Function main
  Pass In: nothing
  Doing some lines of code
  Call: clear monitor
  Doing some lines of code
  Pass Out: value zero to the operating system
Endfunction
```

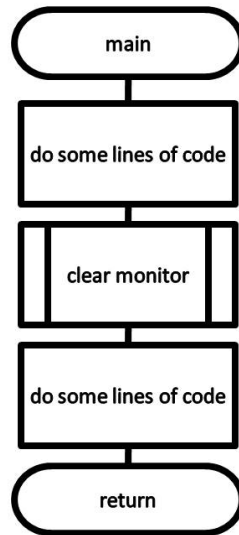


Figure 6.20: Function main

### 6.7.2.2 Sequence Control Structures

The next item is pseudocode for a simple temperature conversion program. This demonstrates the use of both the on-page and off-page connectors. It also illustrates the sequence control structure where nothing unusually happens. Just do one instruction after another in the sequence listed.

#### Example 6.3: pseudocode: Sequence control structure

```

Filename: Solution_Lab_04_Pseudocode.txt
Purpose:  Convert Temperature from Fahrenheit to Celsius
Author:   Ken Busbee; © 2008 Kenneth Leroy Busbee
Date:    Dec 24, 2008
  
```

Pseudocode = IPO Outline

input

```

  display a message asking user for the temperature in Fahrenheit
  get the temperature from the keyboard
  
```

processing

```

  calculate the Celsius by subtracting 32 from the Fahrenheit
  temperature then multiply the result by 5 then
  divide the result by 9. Round up or down to the whole number.
  HINT: Use 32.0 when subtracting to ensure floating-point accuracy.
  
```

output

```

  display the celsius with an appropriate message
  
```

pause so the user can see the answer

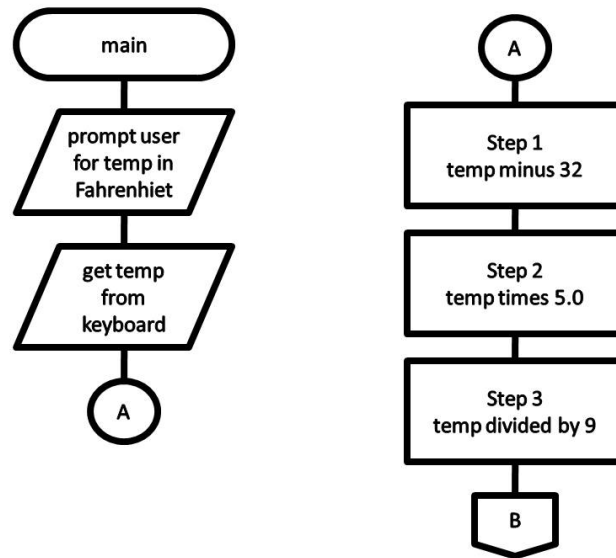


Figure 6.21: Sequence control structure



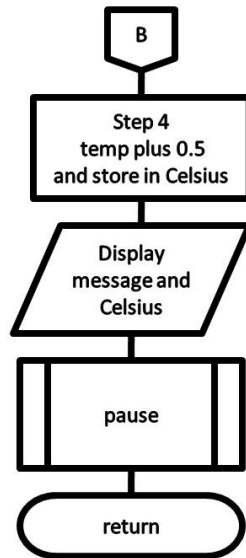
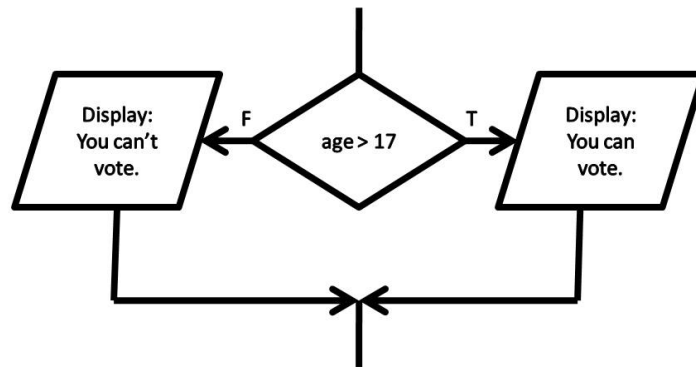


Figure 6.22: Sequence control structured continued

### 6.7.2.3 Selection Control Structures

Example 6.4: pseudocode: If then Else

```
If age > 17
  Display a message indicating you can vote.
Else
  Display a message indicating you can't vote.
Endif
```



**Figure 6.23:** If then Else control structure

**Example 6.5:** pseudocode: Case

```
Case of age
  0 to 17  Display "You can't vote."
  18 to 64 Display "Your in your working years."
  65 +    Display "You should be retired."
Endcase
```

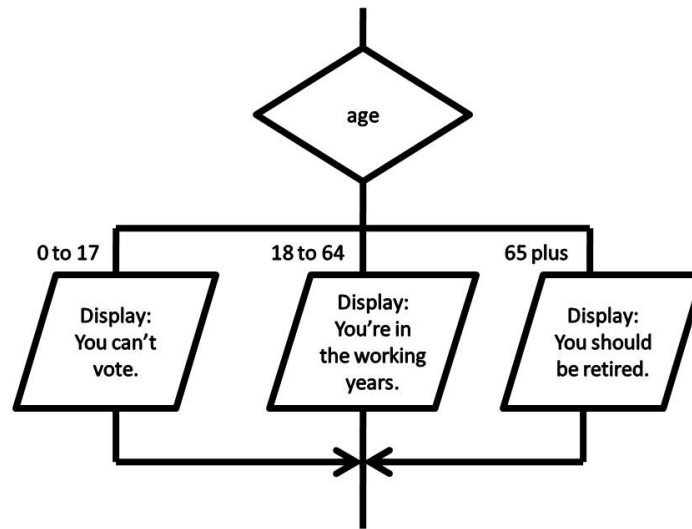
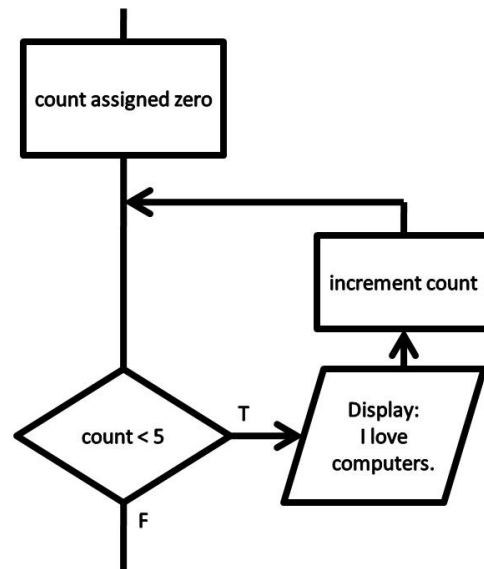


Figure 6.24: Case control structure

#### 6.7.2.4 Iteration (Repetition) Control Structures

##### Example 6.6: pseudocode: While

```
count assigned zero
While count < 5
  Display "I love computers!"
  Increment count
Endwhile
```

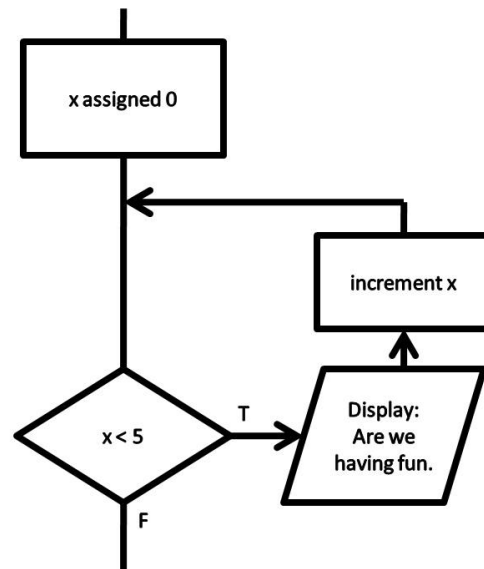


**Figure 6.25:** While control structure

**Example 6.7:** pseudocode: For

```
For x starts at 0, x < 5, increment x  
  Display "Are we having fun?"  
Endfor
```

The for loop does not have a standard flowcharting method and you will find it done in different ways. The for loop as a counting loop can be flowcharted similar to the while loop as a counting loop.



**Figure 6.26:** For control structure

**Example 6.8:** pseudocode: Do While

```
count assigned five
Do
  Display "Blast off is soon!"
  Decrement count
While count > zero
```

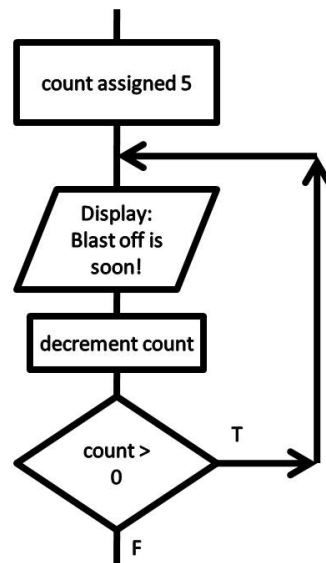


Figure 6.27: Do While control structure

**Example 6.9: pseudocode: Repeat Until**

```
count assigned five
Repeat
  Display "Blast off is soon!"
  Decrement count
Until count < one
```

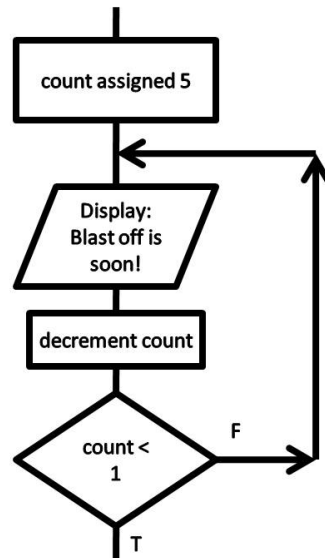


Figure 6.28: Repeat Until control structure

### 6.7.3 Definitions

**Definition 6.1: flowcharting**

A programming design tool that uses graphical elements to visually depict the flow of logic within a function.

**Definition 6.2: process symbol**

A rectangle used in flowcharting for normal processes such as assignment.

**Definition 6.3: input/output symbol**

A parallelogram used in flowcharting for input/output interactions.

**Definition 6.4: decision symbol**

A diamond used in flowcharting for asking a question and making a decision.

**Definition 6.5: flow lines**

Lines (sometimes with arrows) that connect the various flowcharting symbols.

## Glossary

**D decision symbol**

A diamond used in flowcharting for asking a question and making a decision.

**F flow lines**

Lines (sometimes with arrows) that connect the various flowcharting symbols.

**flowcharting**

A programming design tool that uses

graphical elements to visually depict the flow of logic within a function.

**I input/output symbol**

A parallelogram used in flowcharting for input/output interactions.

**P process symbol**

A rectangle used in flowcharting for normal processes such as assignment.



## Index of Keywords and Terms

**Keywords** are listed by the section with that keyword (page numbers are in parentheses). Keywords do not necessarily appear in the text of the page. They are merely associated with that section. *Ex.* apples, § 1.1 (1) **Terms** are referenced by the page they appear on. *Ex.* apples, 1

- A** acceptable, § (53)  
 assumption, § (49), § (93)
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Project Management content

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