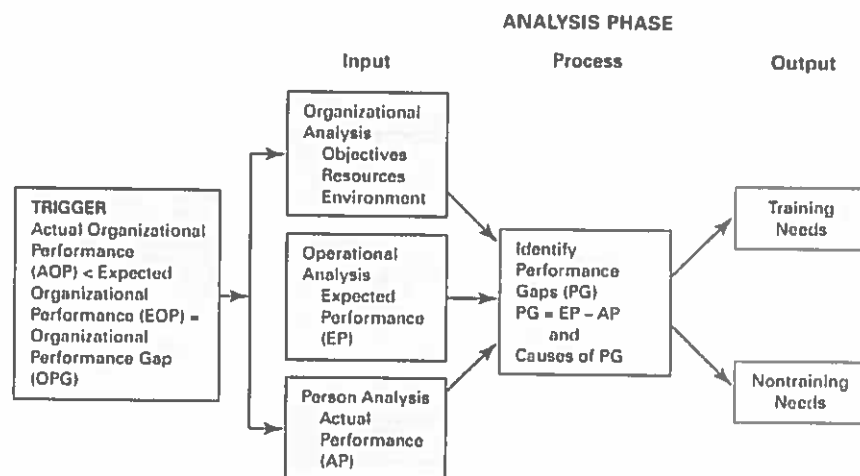


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Needs Analysis



Learning Objectives

After reading this chapter, you should be able to:

- Describe the purpose of a needs analysis.
- List and describe the steps in conducting a needs analysis.
- Explain what a competency is and why it is useful.
- Differentiate between proactive and reactive needs analysis approaches, and describe the situations favoring the use of one over the other.
- Outline the rationale for using performance appraisal information for a needs analysis, and identify what type of performance appraisal method is appropriate.
- Describe the relationship between needs analysis and the design and evaluation of training.
- List four contaminations of a criterion.

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Case Developing a Training Package at Westcan

Chris is a human resources (HR) manager at Westcan Hydraulics, and Irven, the VP of HR, is her boss. One morning Irven called Chris into his office. "I just saw an old training film called *Meetings Bloody Meetings* starring John Cleese," he said. "It deals with effective ways of running meetings." Irven, a competent and well-liked engineer, had been promoted to VP of HR three months earlier. Although he had no HR expertise, he had been an effective production manager, and the president of the company had hoped that Irven would provide a measure of credibility to the HR department. In the past, employees saw the HR department as one that forced its silly ideas on the rest of the company with little understanding of how to make those ideas work.

"Well," said Chris, "I . . ."

"Oh, yes," Irven interjected, "I talked to a few managers this morning and they were enthusiastic about it. It's the first time I have ever seen managers enthusiastic about any type of training. Do we have such a training package available?"

"No, I do not believe so," Chris replied.

"Well," said Irven, "we need a one-day training session. It must be interesting, useful, and generalizable to all managers. Okay?" With that, Irven stood up, signaling that the meeting was over.

Chris went to work designing the training. She began by going to the local university and viewing the meetings film her boss had seen. After examining some books that dealt with meetings, she decided that she had a good idea of what made meetings effective. She then called Larry, a friend at Satellite Systems, to see what he had.

He faxed over a copy of a lecture he had given on the dos and don'ts of an effective meeting. It was nicely broken down into three parts: premeeting, meeting, and postmeeting. That information and a simulated meeting (to provide hands-on practice) could make up the one-day training program. Chris had never written a simulation and needed help. She put in a call to Karen, a subordinate who was fresh out of university and had majored in HR. Karen would surely be able to help develop a simulation, Chris thought.

Why Conduct a Training Needs Analysis?

What is wrong with the situation at Westcan? It is a scene that repeats itself in some form every day. The boss wants some training, and the HR manager complies. After all, the boss must know what kind of training the employees need. Right? Maybe not. Recall from Chapter 1 that a training needs analysis (TNA) is a systematic method for determining what caused performance to be less than expected or required. Performance improvement is the focus of training. This is obvious when you turn to the beginning of the chapter and look at the analysis phase figure. Note that the "trigger" for doing a needs analysis occurs when actual organizational performance (AOP) is less than expected organizational performance (EOP). We refer to this difference as the organizational performance gap (OPG). Does an OPG exist at Westcan? Perhaps. In this situation, we might consider the VP's suggestion that there is a need for training as the "trigger" to conduct a needs analysis. Are the meetings producing less than expected results? To answer this question, Chris would need to conduct a TNA.

If AOP is less than EOP at Westcan, Chris needs to identify where these differences exist in terms of the meetings. Once these are known, other questions need answering. How many meetings are ineffective? What is causing the problem? Is it the manager's knowledge of "how to run an effective meeting," or are other issues causing the meetings to be ineffective? How much do these managers already know about meetings, and how skillful are they at applying this knowledge? Chris needs to answer these and other questions by conducting a TNA before she begins to

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design the training program for effective meetings. Instead, Chris assumes that she knows what managers require and begins to develop the training on the basis of her assumptions. She does not conduct a TNA to determine exactly what the deficiencies are. Think about this scenario as we examine the process of a TNA. Would you want to be in Chris's shoes? We refer back to this example throughout the chapter, and at the end, we give you the rest of the story.

A TNA is important because it helps determine whether training can correct the performance problem. In some cases, the TNA indicates that employees lack the necessary knowledge, skills, and attitudes (KSAs) to do the job and they require training. In other cases, employees have the KSAs to do the job, but there are roadblocks that prevent effective performance. These barriers need to be identified and removed. As a training professional, you will use the TNA to ensure that you provide the right training to the right people. Chris at Westcan is overlooking a critical part of the training process by not completing a TNA. Instead, she is relying on what Irvan says and jumping directly to the training design phase. If Chris were to conduct a TNA first, she could accomplish several important things:

- Increase the chances that the time and money spent on training is spent wisely
- Determine the benchmark for evaluation of training
- Increase the motivation of participants
- Align her training activities with the company's strategic plan

This is one of the longest chapters in the book and that reflects its importance in the training process. Unless you get this part right, the rest of what you do as a trainer won't make any difference. After all, why spend thousands of dollars, or more, on a training program no one needs or which doesn't fit with the needs of the organization? With increased concern about costs, it is important that all departments, including HR and HRD, use resources wisely. So, what will the TNA do for you?

A TNA will provide a benchmark of the performance levels and KSAs trainees possess prior to training. These benchmarks will let you compare performance before and after training. This will allow you to demonstrate the cost savings or value added as a result of training.² We will say more about these evaluation issues in Chapter 9.

A TNA provides more than just evaluation measures. A good TNA ensures that only those who need the training attend and provides the data to show trainees why the training will be useful to them. Consider the employees who do not need the training but are sent by their supervisor anyway. Are they going to take the training seriously? Probably not. In fact, their lack of interest might be distracting to those who need and want the training. Worse, they might cause other trainees not to take the training seriously. Using a TNA also ensures that your training focuses on KSAs the trainees really need. The needs analysis allows the trainer to begin by explaining how the training will be useful. If trainees see the training as relevant, they are more likely to be interested in attending and maintain interest during the training.

As noted in Chapter 1, implementing a strategic plan requires careful analysis of the organization's HR capabilities. A TNA is one process for determining the degree to which employees possess the necessary KSAs to carry out the strategies. Training can then be designed in alignment with the strategic plan. The TNA also provides the human resources department (HRD) with information as to the relevance of training to the strategic plan. This information is helpful in determining which training needs are more important.

When to Conduct a TNA

In spite of the compelling arguments in the preceding section, there are times when a TNA might not be necessary. For example, if the organization is trying to communicate a new vision or address legal concerns, it might be advisable to train all employees. Suppose the company has concerns regarding sexual harassment. Everyone should be aware of how seriously top management considers breaches of their "sexual harassment" policy. Here, company-wide training on the issue might be necessary. Sending everyone to a workshop on sexual harassment

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ensures that management's expectations regarding this issue are clear. It also demonstrates an employer's position on sexual harassment to the courts, should an employee consider a sexual harassment lawsuit.

Another situation in which a TNA might not be necessary is if a team requires team-building skills. In this instance, the goal of training is to build the dynamics of the team so that the members work together cohesively and effectively, and also to provide the relevant KSAs. In this case, everyone on the team should be part of the training, even though they already might possess many team KSAs.

For most types of training, however, a needs analysis is beneficial and will increase the relevance and effectiveness of training. For example, team building for teams that have been working together for a while would benefit from a TNA. In this case, the needs analysis focus is on the team itself, not the individuals in the team. Only teams that demonstrate problems in effectiveness or cohesion would go through a TNA to determine if training is necessary. Teams already functioning effectively would not need to attend, so the overall cost of training is reduced.

The TNA Model

Examine the model at the start of the chapter. The first part of the model is the triggering event that initiates the TNA. For example, when a key decision maker suggests that there is a performance problem now or in the future, a TNA is triggered.

The next step in the TNA model is the input, which consists of an organizational analysis, an operational analysis, and a person analysis. The **organizational analysis** is an examination of an organization's strategy, its goals and objectives, and the systems and practices in place to determine how they affect employee performance. An **operational analysis** is the examination of specific jobs to determine the requirements, in terms of the tasks required to be carried out and the KSAs required to get the job done. It is analogous to a job analysis, or a task analysis, as it is sometimes called. A **person analysis** is the examination of the employees in the jobs to determine whether they have the required KSAs to perform at the expected level.

In the process phase, the operational analysis provides information on expected performance (EP). **Expected performance** is the level of performance expected in a particular job.

The person analysis provides information on actual performance (AP). **Actual performance** is the current level of performance by an individual on a particular job. When AP is lower than EP, a more specific performance gap (PG) is identified. As noted in the model, this **specific performance gap** is the difference between EP and the employee's AP.

* Note that for the TNA trigger, the difference between actual organizational performance and expected performance is called an "organizational" performance gap. The difference between actual and expected performance obtained from the operational and person analysis of the TNA is simply termed a "performance gap."

The "output" phase is your conclusion as to whether the PG indicates either training or nontraining needs, and in some cases, both. This will be explained later.

So, as you can see from the model, a TNA is conducted when a key decision maker in the company notes an OPG (AOP is, or will be, less than EOP). A **reactive TNA** focuses on current performance problems (the OPG currently exists). A **proactive TNA** focuses on performance problems in the future (the OPG will exist at some point in the future). Let's look at an example of each.

A current OPG triggers a reactive TNA. For example, if the expected number of widgets produced per week is 5,000 and actual production is only 4,300, you need to investigate this gap.

As an example of the proactive approach, consider an organization's decision to implement statistical process control (SPC) to improve the quality of its widgets. Sometime in the near future, the employees producing widgets will begin using SPC methods. Potential for a future OPG exists (the trigger) because if the employees do not have the appropriate KSAs for SPC, they will have a PG that will lead to an OPG. This potential gap triggers a proactive TNA to determine whether employees will be able to perform as needed when the organization

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implements SPC. You conduct an assessment of employees' capabilities regarding SPC and find that they are not able to perform the arithmetic needed in the use of SPC. This PG will need to be addressed before SPC can be implemented. As this example illustrates, when you expect an OPG to occur at some point in the future, you should conduct a proactive TNA to verify that the gap will exist and identify the specific KSAs that need to be developed.

An OPG may occur for many reasons (see Figure 4-1), only one of which is a lack of KSAs. You need to conduct the TNA to discover why the gap exists and what can be done to correct it. Consider the problem at a regional telephone company a few years back. Sales revenue did not meet expected levels (AOP was less than EOP), triggering a TNA. The TNA identified that sales were indeed below expectations. The TNA narrowed the source of the less-than-expected sales to the installation and repair unit. The phone company had hoped to increase revenue by having their installation and repair employees make sales pitches to customers for additional services when on a service call. However, data on sales indicated that few such sales took place, so AP was less than EP. Note in Figure 4-1 that several possible causes of a PG are listed. If the cause is not a gap in required KSAs, then some nontraining solution is required to alleviate the PG.

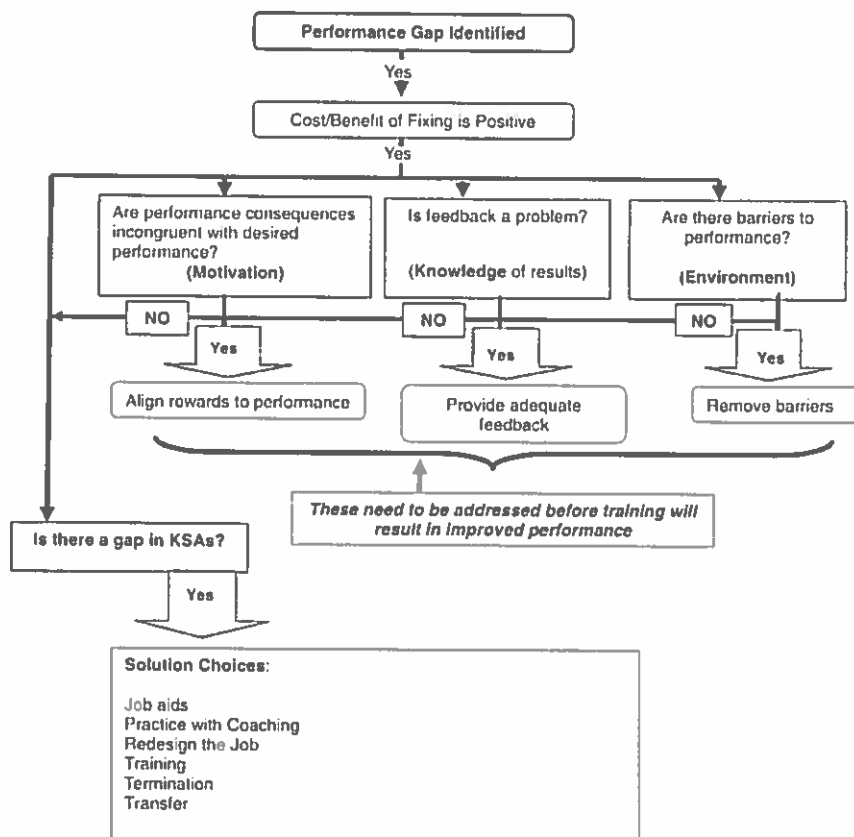


Figure 4-1 Model of Process When a Performance Gap Is Identified.

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What caused the PG? It was not a KSA deficiency. Installation and repair employees' performance was based on the time it took them to complete a call. They had a certain amount of time to complete each call. If they took longer than the time allotted for a number of calls, their performance was rated as below average. The time allotment was not changed, even though employees were now expected to stick around and try to sell their products and services. So, most employees simply did not spend any time selling. In this example, performance consequence incongruities leading to low motivation were what caused the PG. We return to examine Figure 4-1 in more detail later, but now let's examine where we look for PGs.

Where to Look for OPGs

There are numerous places to look for information related to OPGs. A company's archival data, such as its profitability, market share, grievance levels, productivity, and quality measures, provide indicators of how it is operating. These are included in Table 4-1, which provides a list of sources for gathering data related to potential PGs. Let's examine a few to see how the process works. The first data source, organizational goals and objectives and budgets, provides standards against which unit performance can be measured. Suppose, for example, that the triggering event was a loss in profitability because of excessive costs related to warranty work. A reactive TNA is implemented, which might lead you to examine the quality standard for rejects in the production department. The standard (EP) is less than 1 per thousand, but you see that the AP is 12 per thousand.

The process is similar when you expect future performance to be less than what it should be. Here, a proactive TNA is initiated. Suppose the company's new strategic plan indicates a substantial modernization of the plant, including new computerized machinery. There is no OPG now, but the plant manager believes there will be when the new machinery arrives. This possible OPG in the future prompts a "proactive" TNA. As part of this TNA, the HRD department will need to assess the employees' current level of KSAs for operating the new machinery. If these current KSAs are not sufficient, a gap exists for the future.

The second data source, labor inventory, is also useful to determine an OPG in the future and the types of training necessary to prevent such a gap from occurring. Knowing that a number of senior engineers are retiring over the next few years can trigger the HRD department to start training those in line for promotion to maintain the necessary skills. Not being aware of these retiring employees could lead to an OPG because the company would lack enough senior engineers to manage the expected number of projects.

Finally, let's examine the third data source, organizational climate indicators. Identification of high absenteeism in a particular area, or an increasing accident rate, provides you with early signs of problems. The quicker you are able to identify problems, the quicker you will be able to find and implement solutions. This is one secret to an effective HRD department. Cindy Baerman, the human resource development officer of Miller Brewing Company, provides an example for this. She began attending production meetings a few years back. She received funny looks, as the meetings were held to focus on production problems. Why would HRD want to be there? As Cindy pointed out, "What better place to learn of the type of performance problems the line manager is having?"⁴ For her, the focus was on performance management. Being able to react quickly to maintain and improve performance is the first step in a continuous performance improvement framework, which is so important in today's environment.⁴

The Framework for Conducting a TNA

Recall from Figure 1-3 (on page

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7 in Chapter 1) that all five phases of the training model have an input, a process, and an output component. The "input" for the analysis phase, as shown in the figure at the start of this chapter, is made up of organizational, operational, and person analysis. The "process" is where we determine the specific nature of any PGs and their causes. The "output" provides us with either training or nontraining needs—and in some cases, both. So, once

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Table 4-1

Recommended Data Sources for Investigating Gaps in Performance

Sources of Data	Implications for Training Needs	Examples
1. Organizational Goals	This source suggests where training emphasis should be placed.	Maintain a quality standard of no more than one reject per thousand.
Objectives and Budget	This source provides information on both standards and direction.	Achieve a goal to become ISO certified and allow \$90,000 for this effort.
2. Labor Inventory	This source helps HRD identify where training is needed because of retirement turnover, age, etc.	30 percent of our truck drivers will retire over the next four years.
3. Organizational Climate Indicators	These "quality of working life" indicators at the organization level provide indicators of organizational performance gaps.	
a. Labor-management data, strikes, lockouts, etc.	These indicators relate to work participation or productivity and are useful in PG analysis and in helping management set a value on the behaviors it wishes to improve through training.	
b. Grievances		70 percent of the grievances are related to the behaviors of six supervisors.
c. Turnover		
d. Absenteeism		High absenteeism for clerical staff.
e. Suggestions		
f. Productivity		
g. Accidents		Accident rate for line workers increasing.
h. Short-term sickness		Line workers' attitude toward teamwork is poor.
i. Attitude surveys	Surveys are good for locating discrepancies between organizational expectations and perceived results.	
4. Analysis of Efficiency Indexes		
a. Costs of labor		Labor costs have increased by 8 percent in the last year.
b. Quality of product		Number of rejects has increased by 30 percent since the new batch of workers began.
c. Waste		Wasted steel has increased by 14 percent since the company began using part-time workers.
5. Changes in System or Subsystem	New or changed equipment may require training	The line has shut down about once per day since the new machinery was installed.

Source: References for all of these methods can be found in M. Moore, P. Dutton (1978). *Training Needs Analysis*. *Review Critique Academy of Management Review* 3 pp 532-535.

Sources of Data	Implications for Training Needs	Examples
6. Management Requests or Management Interrogation	One of the most common techniques of identification of performance discrepancies.	Production manager indicates a drop in quality since the layoffs.
7. MBO or Work Planning and Review Systems	Provides actual baseline performance data on a continuous basis. From these measures, the company is able to determine improvement or deterioration of performance.	

Source: References for all of these methods can be found in M. Moore, P. Dutton (1978) Training Needs Analysis: Review Critique. Academy of Management Review 3, pp 532-545

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a trigger has set a TNA in motion, the three levels of analysis—organizational, operational, and person—need to be completed.⁹ In the section that follows, we provide an overview of the three TNA inputs. Following this, we provide a detailed examination of each area.

Organizational analysis looks at the internal environment of the organization—influences that could affect employee performance—to determine its fit with organizational goals and objectives. It is this analysis that provides identification of the OPG at the organizational level. Imagine that company ABC decides one of its goals is to become team oriented in its production operation. Examining the various policies of the organization reveals an incentive system that pays up to 15 percent of base pay for individual productivity above quota. This focus on individual productivity is not in line with the new goals of a team approach and could cause team members to be more concerned with their individual performance. It needs to be removed or changed to align with the goals of a team-based approach. The organizational analysis is also an examination of how the internal environment affects job performance. In the ABC example, if both Bill and Mary again do not come to the team meeting, does it mean they are not interested? Perhaps, but it is more likely that they are working on beating their quotas so they will receive the bonus pay. Finally, the organizational analysis identifies constraints on training. Consider the small-business owner who employs unskilled assembly-line workers who are unable to read well. He wishes to move to a more team-oriented approach. The owner does not have the funds or time to develop a remedial reading course. This presents an organizational constraint and leads to the development of training that does not require reading.

Operational analysis examines specific jobs to determine the requirements (KSAs) necessary to get the job done (i.e., expected job performance). This process is generally called a *job analysis*, or task analysis, and it requires an extensive analysis of a job to determine all the tasks necessary to perform the job at the expected level. After all tasks are identified, the next step is to determine the KSAs necessary to perform each of the tasks. Each task needs to be examined by asking the question "What KSAs are necessary to be able to perform this task at the expected level?" The KSAs obtained from the analysis are the ones that an incumbent must have to perform at the expected level. There are several ways to obtain this information, such as interviewing incumbents and their supervisors, observing the job, and so forth.

Finally, *person analysis* examines those who occupy the jobs to see whether they possess the required KSAs necessary to do the job. Here we measure the actual job performance of those on the job to see whether they are performing at an acceptable level. This might seem easy enough: Simply look at the supervisor's appraisal of the incumbents. As you will see later, however, many problems can arise with performance appraisals completed by supervisors, such as halo, leniency, and other effects. In addition, an employee's low performance doesn't necessarily mean he doesn't have the KSAs. So, as a result, other methods are also used to obtain this type of information. For example, asking incumbents themselves and asking coworkers are two other methods. Using job knowledge, behavioral and attitudinal tests are also ways to determine the employee's KSAs. All methods have strengths and weaknesses that will be discussed later.

These "inputs" (organizational, operational, and personal analyses) are conceptually distinct, but in practice, much of the information is gathered around the same time and is closely interrelated. For example, information related to all three types of analyses can be collected from the job incumbents. Questions would include, "Do any particular organizational policies or procedures that you must follow negatively affect your job performance?" (organizational analysis); "Describe for me the tasks you perform when you first arrive at work" (operational analysis); and "Do you believe you are lacking any skills that, if you had them, might enhance your ability to perform at a higher level?" (person analysis). Additionally, the process moves back and forth between the different types. For example, once you find out that the incumbents believe there are organizational impediments, you need to go back to examine if these are real or simply perceptual distortions. Now that you have an overview of these TNA input factors, let's examine each in more detail. Then we will look at some specific issues surrounding the two types of TNA, proactive and reactive.

4-1

Training in Action

Incongruities in the Organizational Environment

Often bank managers will send their tellers to training workshops about the products and services the bank offers. The idea is to give the tellers an understanding of the products and services so they can provide that information to customers who come into the bank. The belief is that this will increase the number of products and services sold. There are numerous accounts of banks providing this type of training, but not seeing any increase in sales. Why is this? Is it just bad training?

Analysis shows that when tellers return from training, they also return to the same performance system (appraisals, salary increases and so on) that had been in place before the training. If the performance system focuses mainly on the number of customers the teller is able to process through the day, what do you think the tellers will focus on? Why would a teller risk receiving a low performance rating to spend time telling customers about the products and services being offered by the bank?

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Organizational Analysis

An organizational analysis focuses on the strategies of the organization, the resources in the organization, the allocation of these resources, and the total internal environment.⁷ The internal environment includes an examination of structures, policies and procedures, job design, workflow processes, and other factors that facilitate or inhibit an employee's ability to meet job performance expectations.

An organizational analysis is necessary to help identify the cause of OPGs and, specifically, to determine whether OPGs are, in fact, correctable through training. According to Nancy Gordon, a TNA analyst at Ameritech, about 85 percent of all requests for training turned out to be related to issues that could not be addressed by training. They were, instead, motivational problems (situations where performance consequences were incongruent with desired performance), which of course, inhibited or prevented the appropriate work behaviors. Training in Action 4-1 provides an example of where this is the case. As you can see in this example, the bank manager neglected to consider the need to align the tellers' performance appraisal with the goals of the new training. So, even if the KSAs were learned, there was no incentive to use them. In fact, tellers would be penalized under the existing performance appraisal system.

An organizational analysis, then, should be able to provide information about the following:

- The mission and strategies of an organization.
- The resources and allocation of the resources, given the objectives.
- Any factors in the internal environment that might be causing the problem.
- The effect of any of the above on developing, providing, and transferring the KSAs to the job if training is the chosen solution to the OPG. These would be considered to be organizational constraints. Should training become one of the solutions for the OPG, you will need to revisit these to determine how the training will be designed to deal with them. We will discuss this in more depth in Chapter 5 .

Mission and Strategies

The organizational analysis helps the analyst align the training with the organization's mission and strategies. Consider the Windsor Ford Engine Plant mission statement: "Our mission is to continually improve our products and services to meet our customers' needs, allowing us to prosper as a business and provide a reasonable return to our stockholders." A strategy arising from that mission statement was to focus on the team approach for continuous improvement. Two types of training traditionally used to support this strategy are training in problem solving and negotiations. But what if the workers in the plant are offered training in traditional negotiation skills? Is this in line with the team approach? Perhaps not. Problem-solving training requires openness and trust to be effective. Traditional negotiations training often teaches that it is useful not to reveal all your information but instead to hold back and attempt to get the best deal

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that you can for yourself or your department. To offer such training would, at best, not reinforce an environment of openness and trust, and at worst, would impede it.

A company's mission and strategies also indicate priorities for training. Training resources are always finite, so decisions must be made as to where to spend the training budget. If, for example, "Quality is job one" at Ford, the analyst knows that development of KSAs relating to quality should receive priority. Thinking back to the Westcan case, can you identify how that company's priorities would be related to the need for effective meetings?

Capital Resources

A company's finances, equipment, and facilities are considered to be capital resources. During strategic planning, decisions are made as to where money should be spent. If a large expenditure is made on new equipment for the machinists, or toward becoming ISO 9000 certified, these strategic decisions will help determine the priorities for the HRD department. In the case of purchasing new equipment for machinists, HRD's priority would be the machinists' positions. You would need to assess the machinists' level of KSAs to determine whether they need training to operate the new machinery. This decision to focus on the machinist is based on the financial decisions made at the strategic level. Likewise, the strategic choice of becoming ISO 9000 certified should indicate to you that support in that area is needed. After all, significant company resources will be directed toward these strategic initiatives. If the employees cannot operate the new equipment or engage in the tasks required for ISO certification, the money put toward those initiatives will be wasted.

Another concern for HRD is its own budget. Decisions about how to provide the required training are a function of the money that HRD has available for training. The decision whether to use external consultants or internal staff depends on a number of issues, not the least of which is cost. In the Westcan case, Chris decided to develop the training herself. Hiring a consultant to provide the training might get better results, but Chris would have to weigh that decision against other training needs at Westcan, given her limited budget.

Human Resources

The other area of resources that needs to be addressed is human resources. Examination of the KSAs in HR occurs at two levels. It includes a general strategic needs assessment and a more specific training needs assessment. First, at the strategic level, HRD provides top management with an assessment of the current employees' ability and potential to support various strategies. With this information, top management knows its employees' capabilities and can factor those capabilities into its strategic decision making. Heinz Canada's Leamington plant decided several years ago that its strategic plan was to improve efficiency in producing ketchup. Heinz wanted to purchase a state-of-the-art automated ketchup maker. The HRD department provided top management with information on the KSAs of the current workforce. This information indicated that no one had the skills necessary, and, in fact, many had reading difficulties such that operating computer-controlled machinery might be a concern. Because the strategic planning group knew this information early in the strategic planning phase, they were able to make an informed decision about how to proceed. They considered the following choices:

- Abandon the idea of purchasing such equipment, and consider alternative strategic plans.
- Hire employees who have the skills to operate such machinery.
- Train current employees to operate the machinery.

Heinz chose to move forward with the plan and train the current employees. Since they addressed the issue early, Heinz had plenty of time to do this.

HRD's strategic needs assessment is more proactive and provides a great deal of information about the capabilities of the workforce to carry out various strategic alternatives. This information helps decision makers decide which strategic alternatives will be followed. Once managers approve a strategic plan, HRD can focus on areas where priorities are identified from the strategic plan.

At the second level, HRD focuses on those employees who are identified to be working in areas contributing to OPGs. This is really part of the person analysis, but an example will help clarify the difference. In our earlier example, it would be the machinist who had to learn to use the new computerized machinery. What about in the Heinz example? Recall that none of the

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Heinz employees has the required KSAs to operate the new ketchup equipment. As a result, although they are effective employees now, an OPG will develop when the new equipment arrives. The HRD department's priority is to provide the employees with the requisite KSAs so that when the ketchup machine arrives, they will be able to operate it effectively.

Organizational Environment

Another key objective of the organizational analysis is to examine the organizational environment. The organizational environment is made up of various structures (e.g., mechanistic or organic) and designs (e.g., workflow, division of labor, pay system, and reward policies). The environmental analysis tells you whether these structures are aligned with the performance objectives of the unit in which OPGs have been identified. A misalignment of the structure or design of the unit will mean that even if the employees have the KSAs to eliminate the performance gap, they will not use them. Identifying this lack of alignment early and aligning the environmental factors with the objectives of training will help ensure that when training is complete, the new skills will transfer to the job.

Consider two organizations:

Organization A decides to adopt a more team-oriented approach. The company's mission and objectives reflect this recent change in company policy. Present procedures include the use of a suggestion box and provide rewards for individual suggestions that improve the company's performance.

In this scenario, do you believe that the individual incentive system would reinforce or hinder the team approach? If, after training and implementing the team approach, teams were not producing innovative ideas, would that mean that the training was not effective? You cannot really tell. The skills might be learned but not transferred to the job. Consider the motivation problems (see Figure 4-1) that occur when rewarding for individual ideas (suggestion box) while expecting a team approach (which means sharing ideas with the team). If you can get a reward for your idea by putting it in the suggestion box, why would you want to freely share it with the team? Identifying this incongruence between rewards and desired behavior and removing it before instituting the team approach would facilitate transfer of the training. If you did this and also implemented a team-incentive system, you would have aligned the unit's reward system with the team approach.

Organization B's mission and objectives can be summed up as "quality is most important." A misalignment occurs in this organization because one of its policies is that performance appraisals for first-line management provide a measure of how well these managers meet productivity quotas, but measure nothing related to quality of the product.

In this scenario, would you expect training these managers in quality improvement to result in improved quality? It might be possible that they already have the quality KSAs and simply redesigning the appraisal system to emphasize quality will close the performance gap. As in the first example, providing the KSAs will not translate into changes in job behavior unless the organizational systems are aligned to support that behavior.

These examples illustrate the value of conducting an organizational analysis into the structures, systems and policies as they relate to performance gaps. Obviously, the analysis at the environmental level can't be conducted until you have an idea of what organizational units and jobs are targeted either for their performance problems or because of future changes. This targeting allows for a certain degree of focus when you are conducting the analysis; you gather data that are relevant only to those jobs. Otherwise, you end up gathering an enormous amount of information on jobs that do not have any current or future problems. This is not only a waste of your time, but also the company's valuable resources.

To summarize, before looking at the individuals whose work is causing performance gaps, you need to examine the organization. Data gathered from the organizational analysis must be examined to determine if organizational systems, structures, and policies are aligned with the behavior that is desired. In almost all cases where training is needed, there are some environmental factors that need to be realigned to support the new behavior that training will be focused on. If they are not, transfer of the training to the job is highly unlikely.*

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Where to Collect Data

Table 4-2 identifies potential individuals to be interviewed and points to raise with them. Once a gap in performance is identified in a specific department or location, the cause of the gap needs to be determined. You should not assume that training is required to alleviate the gap. Do not forget Nancy Gordon's words: "About 85 percent of training requests turn out to be solvable without training."

Operational Analysis

When an OPG is identified, an operational analysis is conducted in conjunction with the organizational analysis to fully understand the nature of the OPG. The operational analysis determines exactly what is required of employees for them to be effective. The typical technique for obtaining the task and KSA data that are required to meet expected job performance standards is the job analysis. Table 4-3 shows sources for operational analysis data. The most frequently

Table 4-2 What Do You Ask and of Whom?

What to Ask About	Who to Ask
<i>Mission Goals and Objectives</i>	
What are the goals and objectives of the organization?	Top management
How much money has been allocated to new initiatives?	Relevant department managers, supervisors, and incumbents
Is there general understanding of these objectives?	
<i>Social Influences</i>	
What is the general feeling in the organization regarding meeting goals and objectives?	Top management
What is the social pressure in the department regarding these goals and objectives, and regarding productivity?	Relevant department managers, supervisors, and incumbents
<i>Reward Systems</i>	
What are the rewards, and how are they distributed?	Top management
Are there incentives tied to the goals and objectives?	Relevant department managers, supervisors, and incumbents
What specifically do high performers get as rewards?	
<i>Job Design</i>	
How are the jobs organized?	Relevant supervisors and incumbents, and perhaps relevant department managers
Where does their work/material/information come from and where do they send it when done?	
Does the design of the job in any way inhibit incumbents from being high performers?	
<i>Job Performance</i>	
How do employees know what level of performance is acceptable?	Relevant supervisors and incumbents
How do they find out if their level of performance is acceptable?	
Is there a formal feedback process (performance appraisal for example)?	
Are there opportunities for help if required?	
<i>Methods and Practices</i>	
What are the policies/procedures/rules in the organization? Do any inhibit performance?	Relevant department managers, supervisors, and incumbents

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Table 4-3 Recommended Data Sources for Operational Analysis

Sources for Obtaining Job Data	Training Need Implications	Practical Concerns
1. Job Descriptions	This source outlines the job's typical duties and responsibilities but is not meant to be all inclusive.	Need to determine how developed. Often written up quickly by supervisor or incumbent with little understanding of what is required.
2. Job Specifications	These are specified tasks required for each job. More specific than job descriptions and may include judgments of required KSAs.	May be product of the job description and suffer from the same problems.
3. Performance Standards	This source provides objectives related to the tasks required and their standards in terms of performance.	Very useful if available, and accurate, but often organizations do not have formal performance standards.
4. Ask Questions About the Job		
<ul style="list-style-type: none"> a. Of the job holders b. Of the supervisor 	Asking both job holder and relevant supervisors provides accurate data.	Must be done correctly to be of value.

used process includes questioning employees doing the job and their supervisors. Let's now examine this process of analyzing a job and the issues to consider.

Analyzing the Job

HR employees need to know how to conduct an effective job analysis. The following steps are useful in doing this.

What Is the Job?

The first step is to determine exactly what job is going to be analyzed. In today's environment, a common job title can mask real differences in the tasks that are carried out. An extreme example is at Honda Canada Manufacturing, where everyone from line workers to top management has the job title of "Associate." Other organizations use the same job title for employees who do different tasks because they work in different departments and geographical locations.

Where to Collect Data?

As **Table 4-3** indicates, data can be gathered from a number of sources. Job descriptions and specifications are one source of data for understanding the job and its basic requirements. If this information was gathered through a job analysis, you can be confident of its value. Even if it was not, it provides a basic understanding of the job and is useful to have before starting to ask questions of these employees.

Who to Ask?

When analyzing a job, the incumbent needs to provide relevant information about the job; after all, she is the expert regarding how the job is done. Data should also be gathered from the incumbent's supervisor because of the following reasons:

- This information provides a different perspective and helps yield a well-rounded concept of exactly what is required.
- When discrepancies are noted between what the supervisor and the incumbents say, an investigation into the reason for the discrepancy can provide useful information.

we have suggested that trainers need organizational development (OD) skills. In this instance, those skills provide an effective way of resolving differences between incumbents and supervisors regarding how the job should be performed. A more proactive approach is to avoid conflicting beliefs between subordinates and supervisors in the first place by implementing

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the **job expectation technique**. This technique includes facilitating a meeting between subordinates and supervisors to discuss the job responsibilities of the subordinates. The goal here is to clarify job expectations. This process may sound simplistic, but it requires trust and respect between supervisors and their subordinates. In reality, many job incumbents learn about their job through working with other incumbents and through trial and error.

Who Should Select Incumbents?

The selection process should be carried out by the job analyst, not the supervisor or manager. If you let supervisors make the decision, they might choose on the basis of who is available at the time or to whom they prefer to give the opportunity, or any other reasons that quite likely would result in a biased sample. Perhaps more important, however, is that the incumbents might question the real purpose of the assessment and provide inaccurate data.

How Many to Ask?

Different jobs in any organization are filled with different numbers of incumbents. Exactly how many to ask is determined by your method of data gathering and the amount of time available. Let's say that a job has five classification levels with 20 incumbents in each level, for a total of 100 incumbents. You have chosen to interview in small groups. You might have four interview sessions, each with five incumbents—one from each level. If time and resources allowed, you might want to double the sessions to eight for increased participation and a more representative sample.

How to Select?

The best way to select the participants is through representative sampling of all those incumbents who are performing "adequately or better" on the job. The incumbents need to be placed into subgroups on the basis of relevant characteristics, such as their level in the job (e.g., mechanic 1, mechanic 2). Once the categories are developed within the job, the job analyst should choose within these categories on the basis of other factors, such as years in the category, performance level, gender, and so on, to ensure that different views of the job are obtained. Note that we do not advocate random sampling. Random sampling is effective only when you have large numbers of incumbents who are similar, which is seldom the case in a particular job. One other issue needs to be considered. What if the number of incumbents is large and they are scattered across the country? **Table 4-4** provides the process used to identify the tasks and KSAs for salespeople at a large computer firm in the United States with offices across the country. Because of the breadth of the job—many different types of equipment (hardware) were sold—and the many different locations, the needs analysis was a major undertaking. The effort was worthwhile, however, because important information was obtained. For example, it was determined that irrespective of the type of hardware sold (cash register or computer), similar tasks and identical KSAs were required. It was also determined that the job was the same in Los Angeles as it was in Detroit. Finally, from the importance scale, it was determined that a number of tasks and KSAs, although performed, were not critical to effective job performance. For example, knowledge of computer operations, and program language, as well as the ability to write simple computer programs were beneficial but not necessary because it was possible to obtain such support in the field.

From these data, the company was able to refocus its selection procedures to include the KSAs necessary at the time of hire and to provide its training department with a clear picture of the training necessary after the salespeople were hired.

What to Ask About?

Several job analysis techniques are available for gathering information about a job. The two main categories are worker-oriented and task-oriented approaches. A **worker-oriented job analysis** focuses on the KSAs that are required on the job rather than on the tasks or behaviors. Incumbents are asked to rate how important a list of KSAs (e.g., far visual differentiation—the ability to differentiate details at distances beyond arm's length—use of precision tools, use of measuring devices) is to the job (see **Figure 4-2**). A drawback of this approach is that task statements are not available to show how the KSAs are linked to the tasks. Such a link not only provides justification for the KSA requirements but also can be used to develop scenarios for use in the actual training.

Table 4-4

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Assessment Procedure Followed by a Large U.S. Computer Firm

1. *Define the job in question.* The analyst met with management to discuss the scope of the assessment. It was determined that the assessment would include all salespeople in the company.
2. *Who to ask.* Because of possible differences between what was being done in offices in different states, incumbents who work in each state would need to provide input. Furthermore, because of the different types of equipment being sold by different salespeople, it would be necessary to have a representative number of incumbents from these subgroups.
3. *What method to use.* Because of the need to include a large number of incumbents who were located in different geographical regions and sold different equipment, the questionnaire method was chosen. This allowed a large number of incumbents to provide input that could be easily analyzed.
4. *Develop a questionnaire.* To develop a questionnaire relevant to the job, the analyst obtained job descriptions from the various locations and for the different types of hardware being sold. He then met with incumbents (in small groups) and with supervisors (in separate small groups) to obtain input on what tasks were done. After the tasks were identified, he asked them to indicate the KSAs that they believed were necessary to do the tasks. The small-group interviews were scheduled so that out-of-state incumbents who were to be at the head office for other reasons could attend, thus providing input from the various states.
5. *Rate importance of tasks and KSAs.* The questionnaire included all the tasks and KSAs that had been identified. Two ratings were requested for each task and KSA. The first related to how important the task (KSA) was to successful job performance (see "How Important Is the Task?").
How Important Is the Task?
 - A. *Not Very Important* Poor performance on this task will not affect the overall performance of the job.
 - B. *Somewhat Important* Poor performance on this task will have a moderate effect on the overall performance of the job.
 - C. *Important* Poor performance on this task will have an effect on the overall performance of the job.
 - D. *Very Important* Poor performance on this task will have a serious effect on the overall performance of the job.
6. *Rate task importance for new hires.* The other rating was related to how important it was to be able to do the task successfully at the time of hire. The following scale is used for that rating.
Importance at the Time of Hire
 - A. *Not Important* A person requires no specific capability in this area when hired. Training will be provided for an individual to become proficient in this area.
 - B. *Somewhat Important* A person must have only a basic capability in this area when hired. Experience on the job or training is the primary method for becoming proficient in this area.
 - C. *Important* A person must show considerable proficiency in this area when hired. There is time or training available only to provide "fine tuning" once the person is on the job.
 - D. *Very Important* A person must be completely proficient in this area when hired. There is no time or training procedure available to help an individual become proficient in this area after being placed on the job.
7. *Send out questionnaire.* The questionnaire was sent to all incumbents and their immediate supervisors.
8. *Analyze data.* Returned data were analyzed to determine if there were any differences between states and between salespeople who sold different hardware.
9. *Display analysis data.* Those tasks that came up with a mean rating of 2.5 and above were placed in the relevant quadrants (see the following chart).

		Importance at Time of Hire	
		Below 2.5	At or above 2.5
Task Importance	At or above 2.5	Training	Selection
	Below 2.5	Not Important	

Information Input	
<p>Note on Rating "Importance to This Job":</p> <p>Rate each of the items in the questionnaire using the "Importance to This Job" scale. Each item is to be rated on how important the activity described is to the completion of the job. Consider such factors as amount of time spent, the possible influence on overall job performance if the worker does not properly perform this activity, etc.</p>	<p>Importance to This Job scale</p> <p>N Does not apply 1 Very minor 2 Low 3 Average 4 High 5 Extreme</p>
<p>1. ___ Far visual differentiation (seeing differences in the details of the objects, events, or features <i>beyond arm's reach</i>, for example, operating a vehicle, landscaping, sports officiating, etc.)</p> <p>2. ___ Depth perception (judging the distance from the observer to objects, or the distances between objects as they are positioned in space, as in operating a crane, operating a dentist's drill, handling and positioning objects, etc.)</p> <p>3. ___ Color perception (differentiating or identifying objects, materials, or details thereof on the basis of color)</p> <p>4. ___ Sound pattern recognition (recognizing different patterns or sequences of sounds; for example, those involved in Morse code, heartbeats, engines not functioning correctly, etc.)</p> <p>5. ___ Sound differentiation (recognizing differences or changes in sounds in their loudness, pitch, and/or tone quality; for example, piano tuner, sound system repairman)</p>	

Figure 4-2 Worker Oriented Approach

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The **task-oriented job analysis**, as the name implies, identifies the various work activities (tasks) required to perform the job. After the tasks are identified, systematically examine these tasks to determine the KSAs necessary to perform them. Now you have justification for the KSAs and potential ideas for developing training. That is why this approach is preferred for a TNA.

One example of the task-oriented approach is the **job-duty-task method**, depicted in Figure 4-3. Note that the job is identified first, and then each of the duties is written out. The writing out of the duties provides a stimulus to generate tasks and subtasks for each of these duties. From the duties, identify the relevant tasks and any subtasks each of these tasks might have. Once all the tasks are identified, identify the relevant KSAs required to perform each of these tasks. This provides the justification for requiring these KSAs. It is possible to list all duties first, followed by tasks and subtasks for each duty, and then go back and identify the KSAs for each of the tasks and subtasks. It is equally appropriate to go through each duty, determine the subtasks, and then identify the required KSAs before moving to the next duty.

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Determining what the incumbents do in the job identifies the duties, tasks, and subtasks. This information is generally obtained by interviewing several incumbents and their supervisors. The list of tasks necessary to do the job is developed by systematically examining each duty and inquiring about the tasks. Identifying the required KSAs is carried out through the examination of each task and asking the question, "What KSAs are necessary to perform a particular task?"

Figure 4-4 depicts an example of a completed job-duty-task method for the job of a HR professional.

Job (Title & Classification code if available):		
Duty 1:		
Task 1:	Subtasks	KSAs Needed
Task 2:	Subtasks	KSAs Needed
And so on until all tasks for the duty have been identified		
Duty 2:		
Task 1:	Subtasks	KSAs Needed
Task 2:	Subtasks	KSAs Needed
And so on until all duties have been analyzed for tasks and KSAs		

Figure 4-3 Example of Form for Recording Job-Duty-Task Data

Job Title: Trainer (Delivery Specialist)		
Duty 1: Provide face-to-face training to groups of 10 or more.		
Task 1: Deliver material in a manner that facilitates learning.	Subtasks: 1. Provide accurate information. 2. Apply approved training methods effectively. 3. And so on. . . .	KSAs Needed <ul style="list-style-type: none"> • Knowledge of topic area and how it is used on the job. • Knowledge of all instructional methods and when to use them • Skill at providing verbal information with minimal or no dysfluencies. • Skill at using all methods of instruction (lecture, case studies, business games, role plays, etc.).
Task 2: Engage/Motivate trainees	Subtasks: 1. Demonstrate value of training. 2. Question trainees to reinforce key learning points 3. And so on. . . .	KSAs Needed <ul style="list-style-type: none"> • Knowledge of training purpose and how the successful completion of training will be of value to the trainee and the organization. • Knowledge of the adult learning process. • Effective interpersonal communication skills: <ul style="list-style-type: none"> • Active listening skills. • Knowledge of when and how to question effectively and skill at doing so. • Skill at providing effective feedback.
And so on until all tasks, subtasks and KSAs for the duty have been identified		
Duty 2: Develop training program content		
Go through the process shown for Duty-1/Task-1 until all duties have been analyzed for their required tasks and KSAs		

Figure 4-4 Example of Applying the Job-Duty-Task Analysis to an HRD Job

Table 4-5 A Comparison of the Outcomes for Worker- and Task-Oriented Approaches to Job Analysis

Job	Task-Oriented Approach	Worker-Oriented Approach
<i>Garage Attendant</i>	Checks tire pressure	Obtains information from visual displays
<i>Machinist</i>	Checks thickness of crankshaft	Use of a measuring device
<i>Dentist</i>	Drills out decay from teeth	Use of precision instruments
<i>Forklift Driver</i>	Loads pallets of washers onto trucks	High level of eye-hand coordination

Another step in the process is to determine how critical each of the tasks is and how important it is to be able to perform the task at the time of hire. By determining this aspect, you can identify those tasks that new employees will be expected to be able to perform at the time of hire and those that new employees will not need at the time of hire (those that will require training). To obtain this information, ask those providing information to rate each of the tasks on a scale such as the one depicted in Table 4-4. This step not only documents the importance of the tasks but also provides valuable evidence for which KSAs will be used in selecting employees and which will not (and therefore require training). Finally, the KSAs necessary to perform each of

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the important tasks and subtasks are identified. These aspects should also be rated for importance to the job and importance at the time of hire.

To understand the difference between the worker-oriented and task-oriented approaches, note the different results obtained using each of these methods, as depicted in Table 4-5.

If There Are No Incumbents Available

Incumbents are a critical group for obtaining information about the job in a job analysis. But what if no incumbents are available? In today's environment of fast-changing technology, jobs are constantly changing. In some cases, new technology creates a job that requires skills distinctly different from the job it is replacing. In the example cited earlier in this chapter, management at the Heinz plant in Leamington ordered a state-of-the-art ketchup machine. Previously, ketchup was made with low-technology equipment. This new machine required new skills, so the issue was to figure out how to perform a job analysis for a job that did not exist. Dr. Mitchell Fields was approached by Heinz Canada to assist in determining the selection and training requirements for the new job. Table 4-6 describes how Dr. Fields did this.

What You Should Get from the Job Analysis (EP)

Using the task-oriented approach yields both the tasks and KSAs required to perform the job. KSAs are important, as it is the KSAs that need to be trained. But the tasks are also important for the following reasons:

- Identifying the expected behavior that needs to be performed on the job and performance gaps
- Developing actual training programs
- Making subsequent evaluations of the training.¹⁰

Knowing all the tasks that are necessary to be effective in a particular job provides justification for the KSAs that employees are expected to have. In the ketchup machine example, the machine operator was required to watch a video display (which is two-dimensional) and make decisions about the assembly line (which is three-dimensional). This justifies the need for spatial relations skills as a job requirement.

A list of job-related tasks would also help develop training. Once the tasks to be performed are known, training that closely resembles the real job can be developed. Consider the job of a customer service representative. We determined that one of the important tasks is to "deal with irate customers." We used this task to help develop role-plays that closely emulate the real job. The use of real-task behaviors in training makes the training more relevant and interesting to trainees and assists in the transfer of training.

Finally, we can use task information to develop tests that are reflective not only of the training but also of the job. These tests can be used in the person analysis phase to identify those with training needs and can also serve to evaluate the effectiveness of training.¹¹ Task identification leads to identification of the KSAs necessary to do the job.

¹⁰ More will be said about how to develop tests in the person analysis section later.

Knowledge

All jobs require some type of knowledge. The job analysis should provide a list of tasks that, when examined, will point to the knowledge requirements necessary to be successful. For example, if one of the tasks identified is to edit manuscripts using Microsoft Word,

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Table 4-6 Job Analysis When There Are No Incumbents

The H. J. Heinz Company in Leamington, Ontario, Canada, is unionized. The union contract stipulates that new jobs go to existing employees. The company was purchasing a new machine for making ketchup and wanted to be sure that those selected for this new job would have the KSAs to do the job. A person analysis indicated that most employees did not have much formal education and had very low reading levels. An operational analysis (job analysis) is necessary to determine future KSAs needed. But how do you do a job analysis when there are no incumbents, as the job does not exist? Dr. Fields outlines how he did the job analysis.

1. I contacted the manufacturer of the new equipment and asked if that or similar equipment was being used elsewhere, so that job analysis data could be obtained from another company. In this case, no other application existed.
2. I obtained specifications and operating manuals for the new machinery. The manuals were incomplete and difficult to understand. In fact, they were more complex than they needed to be. As a result, initially I thought that a high level of reading comprehension would be necessary.
3. I interviewed engineers who were responsible for designing the new machinery. This is where I received important information as to its operation. However, the engineers tended to overestimate the level of aptitude required. They believed that operators would be making modifications to the programming software. Further discussions revealed that for the operator's job, reading requirements were minimal. Operating manuals were needed only for maintenance and repair.
4. I obtained blueprints and layouts of the physical equipment and flowcharts of the operating software. This material indicated that the operators would be required to interface with a user-friendly, icon-driven software package (far less than the complex programming tasks envisioned by the engineers).
5. I identified two main tasks. First, the operators would be required to keep track of the mechanical operations of a number of different (but integrated) assembly operations. I determined, therefore, that mechanical aptitude was necessary. Second, the operators had to look at a two-dimensional video display terminal (VDT) and make decisions about the three-dimensional assembly-line operation. Having skill in spatial relations, therefore, would also be important.
6. On the basis of the skills identified, I suggested two subtests of the Differential Aptitude Test for use in selection of employees: mechanical comprehension and spatial relations tests. All operators were selected from current employees. The major advantage to these two tests is that reading level (which was determined not to be important) is not a factor.

then an inferred declarative knowledge requirement would be knowledge of Microsoft Word edit functions. Going back to our customer service job, we find that knowledge of "steps in a conflict resolution model" would be important.

Assessing the need for declarative knowledge is possible using traditional methods of job analysis, as just discussed. However, some jobs will have knowledge requirements at the procedural or strategic levels.¹¹ The concern is that if the job is reduced to individual tasks, the interrelatedness and complexity of the job is lost.

The operational analysis for higher levels of knowledge would be accomplished by examining the mental models of experts. Here an "expert" could be a high-performing incumbent or someone who performs the same job in another context (e.g., computer programmer). These types of analysis would be useful when more advanced training is required. Techniques such as multidimensional scaling and link-weighted methods can be used to identify such structures.¹² Space does not permit us to explore this area in detail, but those interested in this approach should consult more advanced texts and research papers.¹³

Skill

The job analysis should also provide a list of all skills required to successfully perform the job. Consider again our customer service representative's task of "dealing with an irate customer." This task requires conflict resolution skills. The skills should be identified as

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to the level of mastery required (e.g., compilation vs. automaticity). A completed job analysis will identify a complete list of required KSAs for the job.

Attitude

What are the attitudinal outcomes from the job analysis? Many job analysts do not incorporate attitudes into their model of job analysis. "The job analysis gives an understanding of the tasks that must be carried out. For each task required, knowledge and skills are inferred. However, many analysts stop here, and that is not a good idea. We believe that attitudes are important. They surface in our behavior, so an employee with a poor attitude toward customers is inattentive to customer needs." To determine attitudes of importance to the job, simply ask the question, "Can you think of any attitudes or feelings a person could have that might facilitate or inhibit an employee from doing any part of this job well?"

What attitudes should a customer service representative have to be successful? Would a positive attitude toward helping people be useful? What about a job that requires working in teams? Here, a person should have a positive attitude toward the team approach or perhaps have a positive attitude toward working with others. Such data provide the analyst with information on what should be addressed in training. Just such an issue was of concern in the new Ford assembly plant (see *Training in Action 4-2*). In this instance, the incumbents were unavailable because the plant was not yet open. So the needs analysis was conducted using their supervisors, who were brought on board early to prepare the plant for opening.

Competency Modeling

Another approach to conducting an operational analysis is to identify key competencies of the job. Businesses are increasingly adopting competency models, as they have proven their value as an HR management tool. ⁴⁴

A **competency** is a cluster of related KSAs that differentiates high performers from average performers.⁴⁵ This definition is specific to North America. Other countries, such as the United Kingdom and Australia, define competencies as simply “what someone needs to be doing to be competent at their job.”⁴⁶

4-2

Training in Action

Changing Attitudes Toward the Team Approach

The Ford production plants have moved toward a team approach. The team approach is part of the “Ford Production System.” The Windsor Engine Plant was new, and there was an agreement with the Canadian Auto Workers (CAW) stipulating that employees from other plants had first choice of the new jobs.

Employees transferred from other plants for many reasons: cleaner plant, closer to home, old job being phased out, and so forth. Few transferred to work in a team environment. In fact, it is well known that the CAW traditionally opposes such efforts. They made an exception in the case of the Windsor Engine Plant.

In the determination of the skills needed, it became evident that many of the employees would be older, and the concern was that they would be set in their ways and generally against the team approach. The training consisted of team skills such as communication, effective meeting, and problem-solving skills. Also, a component was added to influence attitudes toward the team approach.

This “component” consisted of an orientation to the team process. Modules were designed to show the advantages of teams for the company and workers. An exercise called “Best Job/Worst Job” allowed trainees to describe what they considered to be a “best job.” Then trainees were asked to consider what teamwork provided in terms of what they would do. Trainees discovered that their own description of a “best job” looked quite similar to what their job would look like in a team environment. The training also provided a six-hour session on individual growth and self-fulfillment. It was assumed that helping employees to focus on these issues would improve their attitudes toward the team approach.

Did the training have a significant impact on attitudes? No one knows for sure. After all the time and money spent on the training, there was no formal evaluation of the process. This omission should not be a surprise, as you will see in **Chapter 9** on evaluation.

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Some disagreement arises as to whether deriving competencies is a process different from job analysis. Some experts in the HR field indicate that the process is the same, but the many have suggested that it is different.¹⁹ The major difference is that traditional job analysis identifies the "tasks" (or the "what") that are done on the job, leading to the determination of knowledge and skills but not attitudes. A competency-based approach focuses on all the characteristics that underlie successful performance,²⁰ not just on the knowledge and skills required for the tasks. Competencies place equal weight on attitudes, and motivation, in addition to knowledge and skills. Because we incorporate attitudes into our job analysis model, we are more in line with this approach. The process for determining competencies is similar to the typical job analysis. Before discussing the "how-to" regarding competencies, let's look at the makeup of one.

Consider the competency "time management" for a manager. Skills for this competency include delegating work, prioritizing assignments, and making to-do lists. The knowledge required is "knowledge of the value of a manager's time." For example, if the manager knew that she was valued at \$120 per hour, it would help her see the value of determining what she does and what she should delegate. Attitudes reflecting "I have no one I can trust to do this," "I cannot say no," or "It is quicker if I do it myself" all get in the way of effective delegation, which in turn affects time management. So, in order for a manager to be effective in this competency (time management) she will need to develop new attitudes, such as "It may take more time now delegate this task and show the person what needs to be done, but in the long run it will save me time," and "I know my boss will be disappointed if I say no to this request, but she will be more disappointed if I say yes and don't get higher priority work completed." These attitudes will support the manager's motivation to delegate tasks which will lead to more effective time management.

Why Competencies?

When compared with KSAs, competencies

- are more general in nature.
- create a common vocabulary to discuss successful performance.
- help employees better understand how to target their efforts.
- promote dialogue between managers and employees that focuses on performance.
- have a longer-term fit.
- include knowledge, skills, attitudes, and motivation.
- tie into corporate goals.²¹

Development of competency models helps companies understand the key factors required for high performance. Competencies identify capabilities and, therefore, are applicable to more than one job. In some cases, competencies are applicable to everyone at a particular level no matter what department, such as all first-line supervisors, or even multiple levels of a job, such as all managers. Table 4-7 provides an example of a competency that is used for all levels of management. Note that while the competency remains the same for different levels of management, the behaviors expected are different. In this way, the focus is always on the same set of key competencies but with different behaviors required, depending on the management level.

In today's environment, jobs are always changing. Even shop-floor jobs are under constant change, in many cases requiring more decision-making and other new responsibilities. This constant evolving means that the specifics obtained in job analysis can become dated. A more general focus of competencies is advantageous to such ever-changing jobs.²²

Using competencies makes it easier to identify the emotional aspects of work performance. For example, organizations increasingly focus on issues such as "meeting customer expectations." This area of the job, which requires dealing with people rather than producing goods, requires a broad view of good performance. Many argue that this broad view is easier to obtain using competency models.

Finally, in the process of developing the job competencies, a great deal of effort is made to understand the business context and competitive strategy. Competencies are then developed with a focus on these broader goals of the organization in conjunction with the specific job in question.²³

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Table 4-7

Competency	Demonstration of the Competency		
	First Level	Mid Level	Senior Level
Customer Orientation	Develops customer consciousness in others	Understands customer needs and translates to the goals of the organization	Establishes a relationship at the strategic level
	Communicates and resolves conflict Ensures work (own and team) exceeds customer expectations	Fosters process improvement and change with linkages to customer groups Instills and maintains customer focus of work unit	Gains trust of customers Formulates strategies to meet identified and anticipated requirements Is considered by customers to be an extension of the organization

How You Develop Competencies

Several methods have been used to develop competency models.²⁴ According to Maxine Dalton of the Center for Creative Leadership, some are not very effective. She indicated that about 70 percent of competency models are just a list of positive attributes obtained in a half-day meeting with senior management.²⁵

Generally, more methodologically sound procedures entail the following process:

- Meet with upper management to
 - determine strategies, goals, specific challenges, or specific focus, and
 - generate some tentative competencies.
- Identify specific jobs.
- Meet with high performers of those jobs and their supervisors to
 - determine critical incidents that make "high performers" different from average performers,
 - focus on the aspects that tie into the strategic direction of the company, and
 - formulate some tentative competencies.
- Determine the competencies that overlap with upper-management competencies.
- Verify the preceding information with another group of high performers and their supervisors.
- Link this information to job analysis information obtained from the job to articulate specific KSAs that make up the competency.

Regarding the last point, competency models are more general and fit several jobs. Linking these competencies to the KSAs of the job will ensure that the competencies are not only valid but also able to stand up in court. This linkage also provides the information needed to develop training. Having the KSAs that make up the competency helps determine what the training should look like.

Issues Related to Competencies

When carried out correctly, a job analysis is scientific and defensible in court. It reflects what is required to do the job, thus making selection, training, and performance appraisal relevant and valid. However, sometimes organizations develop competency models with little understanding of the process outlined above (see **Training in Action 4-3**). This can lead to the identification of inappropriate competencies and possible problems should they be challenged in legal proceedings. Competency models continue to be developed, particularly for training and development, for the following reasons:

- Training based only on task analysis can become dated quickly as the nature of work undergoes constant dynamic change.
- Hourly paid employees are expected to participate much more in decision making and ensure customer satisfaction, rather than simply produce a product.

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4-3

Training in Action

Development of Competencies

The consultant was discussing a training need with a client. As they finished, the client said "I'd like to ask you a question about competencies? The consultant said OK and the client indicated that she had just completed a survey of her company's managers, asking them to identify the competencies that would be required for the various manager positions. She indicated that so far she had gathered over 50 and wondered if the consultant would mind looking at them. "Perhaps," she said, "you might be able to think of some important ones that they had not thought of." The consultant, whose training firm deals with these issues all the time, thought it might be useful to provide her with a mini lecture on what competencies are and are not. He suggested that rather than go through the list they go for coffee and discuss it. Once they sat down with their coffee, the consultant began, "The problem is that most managers and many trainers do not understand what a competency is." When managers are asked to think of all the competencies necessary to be effective in their job, often what is obtained is a list of what managers believe is important to effective performance. The managers usually identify things like initiative, decisiveness, leadership, analytical ability and so forth. In fact, the list really ends up being what you would like a person to be like and not what is required to be effective on the job, which of course is the problem. Too often determining competencies is not done in a methodologically sound way to obtain the information you really want; and so you get wish lists of traits, characteristics, skills, and attitudes with little organization to them. "Well," said the client, "I guess we better talk a bit more about this."

- Corporate downsizing forces a move away from tight job design to more flexible job design.
- Competencies help the HRD department focus its training.

This latter point is particularly important. Competencies not only are related to each managerial level in the organization but also are tied to the strategic direction of the organization. Furthermore, by definition, competencies are what separate high performers from others. With limited resources, decisions related to what needs to be provided in the way of management training are clear.

In very well run organizations, the HR department has a human resource information system (HRIS). This system provides information on individual managers in terms of what positions they have held, what training they have received, their performance levels related to the competencies, and, of specific interest to the HRD department, required competency training for managers. This system makes the task of identifying what training needs to be offered much easier. Examination of the HRIS tells the HRD manager how many need training in each of the competencies. Use of competencies also makes it easier for managers to identify employee strengths and weaknesses, thereby facilitating employees' developmental goals. The easier and clearer the process is, the more likely managers will take the time to do it.¹⁸

Some concern might be raised that competencies are not developed with the rigor of job analysis, and the lack of specificity might not be able to withstand possible court challenges. We argue that as with any tool, proper methodology will result in relevant and definable competencies. Organizations that decide to use competencies should not abandon job analysis, but use its methodology to demonstrate the link between the relevant KSAs and key competencies of the job.

Now let's go back and consider the total operational analysis process, whether KSAs or competencies are used. Data related to the job are gathered to determine standards for acceptable performance. From these standards, criteria are developed. Developing criteria is an important but complex process, so an examination of the issues involved in criterion development is presented in Appendix 4.1 . Understanding this information will also help you understand the criterion issues related to evaluation presented in Chapter 9 .

Person Analysis

There is a long-standing rule in carpentry that says "measure twice, cut once." The point of this is that if you don't have your measurements right, then you just waste your time and material.

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The same applies to the person analysis. If you don't measure your KSAs well, you will waste time and resources. The operational analysis determines the tasks (or competencies) and KSAs necessary to reach or exceed EP. It is also where the measures for these things are created. A person analysis will identify those incumbents who are not meeting the performance requirements and will determine why. Those not meeting performance requirements are relatively easy to identify. What is more difficult is determining whether they have KSAs needed to meet EP. Here, each employee is examined to determine if they have the necessary KSAs to meet performance expectations. Imagine that the EOP for a department that assembles widgets is five rejects per month. This department's AOP is 20 rejects per month. This triggers a TNA. The operational analysis identifies the KSAs necessary to build the widgets properly. A person analysis is conducted to identify those not meeting the EP and to determine which, if any, of the employees do not have the required KSAs. Those employees will be sent to training. Recall from the needs analysis model at the beginning of the chapter that the formula for a PG is:

$$\text{Expected performance} - \text{Actual performance} = \text{Performance gap}$$

* Recall that this "performance gap" is different from the "organizational performance gap" in that it is obtained through comparing the operational analysis (what is required) with the person analysis (how the person actually performs). It is the combination of PGs that create the OPG.

A PG is most often thought of in the reactive sense, as the difference between EP and AP. For example, assume that the standard number of snowmobile trailers that a "Builder Class 2" is expected to produce is 1.5 per day. For the last three weeks, three employees in this class are averaging 0.6 trailers per day. The PG is 0.9 trailers per day (1.5 - 0.6 = 0.9).

In the proactive analysis, the EOP is what is needed in the future and AOP is the likely performance level with current KSAs. Suppose that the trailer manufacturer in the preceding example decides to purchase equipment that will bend the trailer frame to the correct shape, eliminating several welds. The engineering studies indicate that this change in production process will increase the "Builder Class 2" output to three trailers per day. At the present KSA level, "Builder Class 2" employees are expected to produce 1.5 trailers per day. Here, the PG is the "future" required performance level (three trailers per day) minus their predicted performance level in the future, given their current level of KSAs. This PG will be 1.5 trailers per day. In addition to collecting information regarding the PG, you should also examine individual differences that might be present in the trainee population, which might affect the type of training you offer. Self-efficacy of trainees, for example, has been shown to be an important variable related to successful completion of training. Refer back to Figure 3-6 (page

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77) for a number of areas to consider related to individual differences.

Where to Collect Data (AP)

Table 4-8 shows sources for person analysis information. The decision of what to measure and how to measure it is made in the Operational Analysis. Once these decisions are made the measures themselves need to be developed. The development of the measures also occurs in the Operational Analysis. We discuss them here in the Person Analysis because of the close connection between what evaluative measures are used and what is learned about the people who are evaluated.

We will discuss two of the more commonly used sources, performance appraisal and proficiency tests, in some detail. We will also address the less commonly used attitude survey.

Performance Appraisal

Supervisors are the ones who most often complete performance appraisals.” If supervisory ratings actually provided an accurate assessment of an employee’s performance gaps, other assessment tools would hardly be necessary. But these ratings often suffer from a lack of reliability and validity for a number of reasons:

- Lack of supervisor training on how to use appraisals
- Lack of opportunity for the supervisor to see substantial amounts of a subordinate’s performance

Table 4-8 Data Sources for Person Analysis

Sources for Obtaining Data	Training Need Implications	Remarks
1. Supervisor Performance Appraisals	Useful if done specifically for TNA.	Supervisor ratings often not just for TNA, and often not done well.
2. Performance Data <ul style="list-style-type: none"> a. Productivity b. Absenteeism and tardiness c. Accidents d. Grievances e. Waste f. Product quality g. Downtime h. Customer complaints 	Shows who is not meeting performance standards, but not why.	Useful, easy to analyze and quantify for the purposes of determining actual performance.
3. Observation—Work Sampling	More subjective technique but provides both employee behavior and results of the behavior.	This is done effectively in some situations such as customer service where employees know that the telephone calls employees answer from customers can be monitored.
4. Interviews/Questionnaires	Used here to focus on employee’s perception of her training needs and attitudes. Also involvement in TNA motivates employees to learn.	Need to be sure employee believes it is in her best interest to be honest; otherwise, she may not be forth-coming as you would like. Also she may not know what her needs are.
5. Job Knowledge Tests	Shows specific KSA levels.	Care in the development of tests and scoring keys is important and difficult to do if not trained in the process. Can be tailor-made or standardized.
6. Skills Tests Simulations <ul style="list-style-type: none"> • Role-play • Case study • Business games • In basket 	Certain knowledge, skills, and or attitudes are demonstrated in these techniques.	Care must be taken so that they measure job-related qualities. Useful, but again, care in development of scoring criteria is important.
7. Assessment Centers	Combination of several of the above techniques into an intensive assessment program.	Although expensive, these are very good as they use multiple raters and exercises to assess employees. Also, criteria for performance are well developed.
8. Coaches	Have extensive interactions with trainee and can get a good feel for gaps in competencies.	Coaches must be competent to assess training needs.
9. Individual’s objectives	Shows the relationship between performance data and the individuals’ goals.	Good process when implemented properly.

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Rater errors such as bias and halo and leniency effects, among others

- Poorly developed appraisals and appraisal processes

If appraisal instruments are developed properly and the process of completing them is followed conscientiously, performance appraisals can be a valuable source of employee training needs. The literature, however, suggests that this is not often the case.

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Supervisor ratings provide less-than-accurate assessments of the incumbent's KSAs for both political and interpersonal reasons.³⁸ This inaccuracy is less likely to occur if performance appraisal information is gathered specifically for employee development, where the climate in the organization fosters such development.³⁹

Several things can be done to minimize problems with supervisor ratings, such as:

- Have the appraisal system be relevant to the job. Sometimes appraisals are too generic to meet specific needs. Also, they need to be acceptable to both supervisor and employee.⁴⁰
- Be sure that the supervisor has access to relevant information to make accurate appraisals. As noted earlier, in some cases, supervisors are not in contact with subordinates often enough on the job to be aware of their performance.⁴¹
- Provide incentives for supervisors to complete accurate ratings. One way to do this is to use the performance appraisal for the TNA only. As Murphy and Cleveland note, "It is likely that a supervisor experiences little conflict when information from a performance appraisal is being used for providing feedback to employees on their strengths and weaknesses and to recommend employees to training programs."⁴²

One way to obtain better supervisor assessments is to provide training on how to complete such appraisals. Training should address how to avoid various types of rater bias, such as halo⁴³ and leniency⁴⁴ effects.

Another concern is that for some jobs, such as teaching and sales, supervisors do not often get to see the employee in action. Sometimes the supervisor is unfamiliar with the job details. Perhaps the best way to deal with these concerns is similar to the method suggested for dealing with gathering job analysis data: The more the perspectives, the better the picture. For this reason, it is useful to consider additional potential raters of employee performance.

Self-Ratings

A possible way to determine employee needs is through self-ratings. Much of the research on self-ratings suggests that the individual tends to overrate her capabilities. However, evidence also indicates that the inflated ratings are a function of the rating instruments rather than the individual attempting to sound better.⁴⁵ Also, when self-raters understand the performance system, they are more likely to agree with supervisor ratings.⁴⁶ These findings suggest that self-ratings are accurate if subordinates are more involved in the development of the appraisal process.

McEnergy and McEnergy examined self-ratings and supervisory ratings gathered for a needs analysis related to training.⁴⁷ They noted that self-ratings were inflated but were also more discriminating in identifying different needs than were supervisory ratings. Furthermore, the results suggested that supervisory assessment of "subordinate needs" more closely resembled the needs of the raters themselves. More recent research noted that self-ratings actually have lower measurement errors than supervisor ratings on some performance dimensions.⁴⁸ In short, self-ratings are an important part of any needs assessment.

Generally, the more sources used to gather information, the higher the reliability and validity of the results. This tendency supports use of the 360-degree performance review⁴⁹, by which an employee rates himself on a number of dimensions and receives ratings on these dimensions from his supervisor, peers, subordinates, and sometimes even customers.⁵⁰ This information is fed back to the individual. This broader view takes pressure off the supervisor, especially when others in the loop agree more with the supervisor than with the individual. Such data provide a springboard for dialogue between the supervisor and the subordinate regarding the subordinate's needs. Also, there is evidence that those being appraised view this process more positively than they do the traditional methods of appraisal.⁵¹

The advantages of this process are that the various groups see the person under different conditions, maintain different relationships with the individual, and also have different expectations regarding performance. Evidence indicates that ratees find feedback from peers and subordinates particularly useful in planning their developmental goals.⁵² As noted before, the more the sources of such information, the better. The disadvantages of the 360-degree performance

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4-4

Training in Action

Most managers at United Parcel Service (UPS) participate in a 360-degree feedback process. They are measured on a number of critical skills such as "customer focus," "people skills," "business values," and so forth. To be effective, however, managers need to understand why this 360-degree feedback is useful, and how it will work. To assure this happens, HR trainers hold short training sessions to explain the purpose and process of 360-degree feedback to all involved, as well as to provide them with training in feedback skills.

Each manager that has received the training will then begin to rate peers, supervisors and subordinates as well as be rated by their peers supervisors and subordinates on a semiannual basis. After receiving their ratings, the managers and their supervisors will have a discussion about the feedback. Objectives for improvement over the next six months are set, and the manager has the option of attending programs that provide skills training and practice in areas identified as requiring improvement. This process is repeated every six months to determine where improvement has occurred and setting new objectives based on the new 360-degree feedback data. What has been the reaction by those being rated? According to one of the trainers at UPS most employees have responded very positively. But the trainer goes on to say that an important part of the implementation was making sure all those affected understood the purpose of the process and were given appropriate training in how to give and receive feedback.

review are the amount of time it takes and the cost of implementation. If not properly integrated into the company's HR system, it can also lead to negative results. So, for it to be effective, a supportive climate is necessary for development in general, and, as always, support from top management is helpful.

To summarize, performance assessments designed to focus on development are more likely to provide accurate data than are more generic or all-purpose appraisals. Also, to determine developmental needs, both supervisory ratings and self-ratings should be gathered. Both parties need to be involved in the assessment process. As McEney and McEney suggest, the supervisor provides a valuable perspective on the subordinate's needs. The subordinate gains insight into his needs through discussion with the supervisor. This process will also improve communication between the supervisor and the subordinate and will serve to improve the accuracy of the assessment. The 360-degree feedback data are also very useful in determining an employee's needs. These data will allow for an examination of the performance from a broader perspective. It is important, however, that if 360-degree feedback is being used, it must be incorporated properly into the organization. United Parcel Service, in Training in Action 4-4, seems to be doing it properly. Rather than rely on ratings of job performance an alternative is to test individuals under controlled conditions. Testing can measure either knowledge (cognitive) or skills ((behavior).

Job Knowledge (Cognitive) Tests

A cognitive test measures a person's knowledge. Every job has a knowledge component. Plumbers need to understand government regulations for installing water and drainage systems in a house, supervisors need to understand the procedures for assigning overtime, and salespeople need to understand the procedures for accepting returned merchandise. A cognitive test to measure that job knowledge can be developed or found in the marketplace. For example, there are paper and pencil tests that are available in the public domain. The *Mental Measurements Yearbook*,™ a publication produced by the Bureau Institute of Mental Measurements at the University of Nebraska, provides users with a comprehensive guide to over 2,700 contemporary testing instruments. Typically, the type of knowledge examined in the TNA is declarative knowledge. But remember that there are also two higher-level knowledge outcomes: procedural and strategic. One final note about cognitive (and other) tests: A common belief holds that a specific time limit needs to be given for a test. Understand that speed tests provide different information than power tests. Speed tests should be given only if speed in retrieving and using information is an important job characteristic. If, however, the critical component is accuracy of retrieval and use of the knowledge, time limits should not be used. In general, however, power tests do need some sort of time limit, as without one, some trainees will remain for twice the time

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of others to check and recheck their answers. A good approach is to indicate a general time limit (e.g., about one hour). When the time is up, ask, "How much time do you need to finish?" This question is usually enough incentive for those who are simply reluctant to hand the test in.

Declarative Knowledge Tests

If the job requires some sort of factual knowledge, such as "rules covering search and seizure" or "understanding the type of question that cannot be asked in an interview," a test can be developed to determine whether trainees have this declarative knowledge. Paper-and-pencil tests such as the multiple-choice test are often used. One concern in using such tests is that they might reflect the reading level of the participant when reading is not an important skill for the job. If you are concerned about the knowledge level of incumbents and reading is not a required KSA, paper-and-pencil tests would not be appropriate. In such cases, these tests could be given orally.

Multiple-choice tests offer many advantages. They can assess the knowledge of a large number of employees at a lower cost than most other forms of measurement. They are easy to administer and score and, when skillfully developed, can accurately measure knowledge. A big advantage of multiple-choice tests is that their reliability is typically higher than other types of tests. This is especially true when they are well constructed. Also, because of the number of questions that can be asked, it is possible to cover a broader range of the content than with other methods. Some trainees indicate that they are not good at taking multiple-choice tests. However, evidence suggests that such tests consistently correlate highly with other forms of testing. The major difficulty with this type of test is in the construction of the items. A complete discussion on how to write good multiple-choice questions is beyond the scope of this text, but some general rules to consider in constructing questions are found in Table 4-9. Table 4-10 provides some examples of common errors in the development of multiple-choice tests and how to fix them. More comprehensive information can be found in *Evaluating Training Programs*, a book published by the American Society for Training and Development. It might be wise to contact a local university and discuss the project with someone who has the appropriate background. Even small companies with limited budgets should be able to obtain such help from a supervised graduate student eager to get some real-world experience.

Procedural Knowledge

The second type of knowledge is procedural knowledge. Here, the learner begins to develop meaningful ways of organizing information into mental models. Mental models are also known as cognitive maps, knowledge structures, and task schemata. As mentioned earlier in the chapter, experts develop more complex mental models for the way they organize their knowledge than do new learners. As a result, the expert can access a solution strategy more quickly.

There are several techniques for assessing how someone has organized procedural knowledge. One method uses paired comparisons to determine how the person sees the relationship between topics. For example, trainers could be asked to indicate the relationships among several training concepts, such as instructional design, criterion development, needs assessment, organizational analysis, and so on. Then, these relationships would be compared with the relationships identified by an expert. Another method (see Figure 4-5) uses a configuration of concepts that are linked. Some of the links are blank, and the trainee must place the appropriate concepts in the blanks next to the one that makes a best fit. Strategies for measuring these structures are too comprehensive to be discussed here, but several publications deal with this topic.

Strategic Knowledge

The category of strategic knowledge deals with the ability to develop and apply cognitive strategies used in problem solving. It assesses the trainee's level of understanding about the decisions or choices a trainee must make. Determining a person's strategic knowledge is more difficult than the other two types of knowledge. One process that is useful is called Probed Protocol Analysis. First, subject matter experts define a problem and the strategies necessary to solve it. Trainees are then asked to explain step-by-step what they would do to solve the problem. Questions such as "Why would you do that?" "What would it mean if it did not help?" and "What other test could you do?" help determine the trainees' strategies. Once again, for more detailed information, several excellent publications are available.

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Table 4-9 Guidelines for Developing a Multiple-Choice Test

1. Examine objectives to gain a clear understanding of the content area to be tested.
2. Write the questions in a clear manner. Shorter is better.
3. Choose alternatives to the correct response that are plausible, take from typical errors made during training. Make alternatives realistic.
4. Do not consistently make the correct response longer than incorrect responses.
5. Limit the number of alternatives to the amount necessary to measure the knowledge or opinion. For measures of knowledge, it is difficult enough to write three reasonable alternatives along with the correct answer. For other types of measures (such as the one below), too many alternatives ask the respondent to make unnecessarily fine discriminations.
Bad: What percentage of the time are you sure of what your compensation will be?

1	2	3	4	5	6	7	8	9	10
0% – 10%	11% – 20%	21% – 30%	31% – 40%	41% – 50%	51% – 60%	61% – 70%	71% – 80%	81% – 90%	91% – 100%

Good: What percentage of the time are you sure of what your compensation will be?

1	2	3	4	5
0% – 10%	21% – 40%	41% – 60%	61% – 80%	81% – 100%
6. Place the correct answer randomly among other options.
7. Avoid double negatives. Also avoid as much as possible negatively worded questions and alternatives. If it is necessary to use negatives, put the negative words in capital letters and underline them. For example, such a question might look something like this: Which of the following alternatives is NOT correct?
8. Try to avoid the use of alternatives such as "None of the above" and "All of the above." As much as possible, the alternatives should contain only the correct response.
9. Pretest items by giving the test to those expected to know the material. Ask them for feedback on clarity. Note any questions that many of them get wrong.
10. Give revised items to a group of fully trained (experienced) employees and a group of not trained (inexperienced) employees. The former should score well, and the latter should do poorly.
11. Write simply and clearly, and make the meaning obvious.
Bad: To what extent do supervisors provide information regarding the quality of performance of people at your level?
Good: How often does the person you report to give you feedback on your job?
12. Ask one question at a time.
Bad: Both the organization's goals and my role within the organization are clear.
Good: The organization's goals are clear.
My role within the organization is clear.
13. Provide discrete response options.
Bad: During the past three months, how often did you receive feedback on your work?

1	2	3	4	5
Rarely	Occasionally	Frequently		

Good: During the past three months, how often did you receive feedback on your work?

1	2	3	4	5
Not once	1 – 3 times	About once a week	More than once a week	Once a day or more
14. Match the response mode to the question.
Bad: To what extent are you satisfied with your job?

1	2	3	4	5
Strongly disagree	Disagree	Agree	Strongly agree	

Good: To what extent are you satisfied with your job?

1	2	3	4	5
Not at all	A little bit	Quite a lot	Very much	

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Table 4-10 Examples of Mistakes in Developing Multiple-Choice Questions

<i>Example 1</i>	
The stem of the original item below fails to present the problem adequately or to set a frame of reference for responding.	
Original	Revised
Who do you go to when you have a conflict?	Who should you go to when you have a conflict at work?
<ul style="list-style-type: none"> a. Superior/Supervisor b. Subordinate c. Colleague d. Customers/Stakeholders 	<ul style="list-style-type: none"> a. Superior/Supervisor b. Subordinate c. Colleague d. Customers/Stakeholders
<i>Example 2</i>	
There should be no grammatical clues to the correct answer (a 5 a)	
Original	Revised
Barack Obama was a. <ul style="list-style-type: none"> a. senator from Illinois b. eastern European c. Arabic prophet d. Imam 	Barack Obama was <ul style="list-style-type: none"> a. a senator from Illinois b. an Eastern European c. an Arabic prophet d. an Imam
<i>Example 3</i>	
Alternatives should not overlap (e.g., in the original form of this item, if either of the first two alternatives is correct, "C" is also correct.)	
Original	Revised
How old were you when you first started smoking? <ul style="list-style-type: none"> a. While in grade school. b. While in middle school. c. Before I graduated from high school d. After I graduated from high school 	How old were you when you first started smoking? <ul style="list-style-type: none"> a. Less than 10 years old. b. Between 10 and 15 years old c. Between 16 and 19 years old. d. Over 19 years old.
<i>Example 4</i>	
Example of how the greater similarity among alternatives increases the difficulty of the item.	
<i>Easier</i>	<i>Harder</i>
Which of the following statements about training in different cultures is true? <ul style="list-style-type: none"> a. Europeans will resist training that requires trainee involvement. b. Russians require training to be attention Grabbing. c. Asians look forward to the "flash" of North American-style training. d. Greeks require lots of technical components to be successful. 	Which of the following statements about training in different cultures is true? <ul style="list-style-type: none"> a. Europeans require training to be attention grabbing. b. Russians require training to be attention grabbing. c. Asians require training to be attention grabbing d. Greeks require training to be attention grabbing.

Skills (Behavioral Tests)

Behavioral tests measure skills and are an important means of determining an employee's training needs. Such tests can incorporate **work samples**, which are simply work situations designed to reflect what actually happens in the workplace. Standardized rating methods are developed so that everyone is presented with the same situation and measured according to preset criteria. For example, a welder might be required to measure and cut three pieces of channel iron and then weld them at right angles to make a U; a salesclerk might be required to respond to an irate customer who provides standardized antagonistic responses to the salesclerk's handling of a situation, or a manager might be required to make a

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The following list of concepts is related to road construction. Use them to fill in the appropriate blank boxes in the map. Try to fill in the boxes so that related terms or concepts are clustered together. Concepts can be related because they occur at the same time, one is necessary for the other, or one leads to the other. Each of the listed concepts is used only once. Note that some of the concepts are already mapped for you.

- Concepts:**
- | | | |
|--------------------|-----------------|----------|
| Asphalt placement | Prime/tack coat | Striper |
| Compaction/rolling | Rollers | Striping |
| Cut/fill | Signage | Survey |
| Dump truck | Site access | Traffic |
| Hot materials | | |

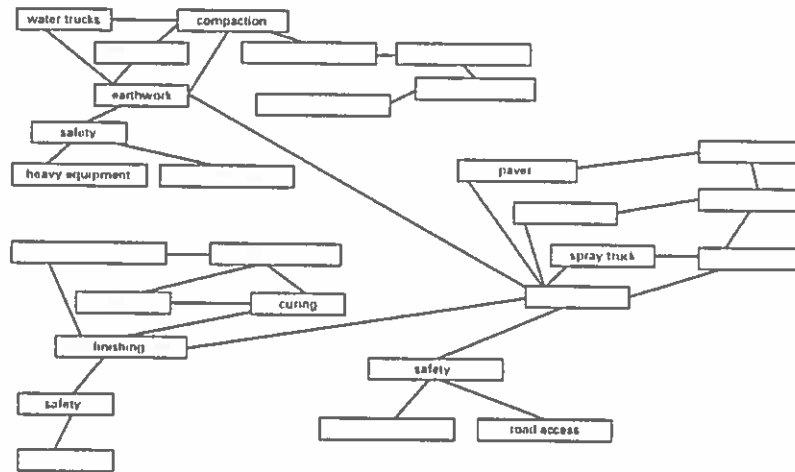


Figure 4-5 Test of Knowledge Organization for Civil Engineers²²

presentation to a boss on the advantages of going global. An important part of the development of these types of tests is determining the criteria for successful performance. In the case of the welders test noted above, what amount of error in measurement is still considered acceptable; 1/8 inch, 3/16, 3/8? Also, what error in terms of the 90 degree angles is acceptable? And finally how strong does the weld have to be? These data would all be used in grading the welders test, and where she was not up to standards would be the PG for that welder. **Assessment centers** are an expansion of the work sample approach. They often involve several work samples and other tests along with assessors who evaluate individuals in different situations. Although assessment centers are costly to develop and administer (they often require two to three days off-site), they provide a comprehensive analysis of needs, especially for managerial positions.

In addition, there are many **simulations** that can be used to assess an employee's skills. Equipment simulators, role plays, business games and so on can be used to determine a person's skills in particular situations. As indicated in the first chapter, skills can be broken down into two levels, compilation and automaticity. The focus of the person analysis will depend on the level of skill required that was determined in the operational analysis.

Compilation

Developing behavioral tests and standards for scoring such tests can be difficult. A number of situations need to be created in which the trainee is required to demonstrate the target skill(s). The difficulty lies in developing scoring standards. Consider a study that examined the training of machinists.²³ It was noted that passing the training was more a function of the trainer

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who was running the course than of the trainees. Different trainers used different standards for passing. This problem should have been addressed in the TNA where the performance standards for the job were identified and the employee's skills were measured to see if they met expectations. Criteria based on tolerance requirements and finished specifications should have been used to determine who needs training. These criteria, once developed, are incorporated into the training objectives that will be developed to guide the training. They also become clear standards from which to evaluate the effectiveness of the training. For skills that have a specific output, such as a part for an automobile, assessment simply compares what was produced with what was required. For other skills, such as those required for conflict resolution, assessment could occur through the use of a structured role-play scenario in which a person acts in an angry and aggressive manner and the employee responds. These types of tests can be scored using multiple raters or standardized forms. Achieving inter-rater agreement is important in developing such tests. This consistency is accomplished through standardized methods of rating that are clear to the trainer or whoever is required to conduct the testing.

Automaticity

In some cases, the skill must be so well learned that it can be done quickly and without much thought. For this level of skill, the assessment would need to use more stringent criteria for what constitutes successful performance. One method for determining whether the trainee reached automaticity would be the speed that required performance was completed and the quality of the response. Emergency procedures for commercial pilots would be an example of skills that are actually periodically tested using aircraft simulators.

Attitude Measures

Attitudes are an important part of organizational effectiveness. If, for example, the team approach is an organizational objective, then attitudes toward this approach are important. Some organizations routinely conduct various attitude surveys. In such a situation, a scale related to the attitude toward teamwork could simply be included. If this practice does not exist, it might be useful to consider instituting one. At the very least, organizations could survey trainees before training to determine how they feel about teams and teamwork (if teamwork was a PG).

Developing attitude scales requires a great deal of skill; therefore, it is much better to use well-developed scales found in the literature. Numerous attitude scales are available through journals (*Personnel Psychology*, *Journal of Applied Psychology*, *Academy of Management Journal*, *Academy of Management Review*, *Academy of Management Executive*) and books (*Assessing Organizational Change*, *The Experience of Work*, *Buros Book of Mental Measurements*). Another source that publishes such scales is the Institute for Social Research at the University of Michigan.⁴ Contacting a local university's psychology department or business school for help in this area would likely yield good results. Graduate students are always anxious to apply their knowledge in real-world situations.

Developing attitude scales requires care, and you should use existing scales whenever possible rather than attempting to develop one yourself. However, items in the survey might need to be reworded to reflect the specific training being done. An example of an attitude scale (attitude toward empowerment) can be found in Table 4-11.

Gathering Data for the TNA: Final Thoughts

For a conceptual understanding of the types of data required to conduct a TNA, it is useful to divide the TNA input phase into three distinct stages: organization, operation, and person. Practically, however, they are highly interrelated, can be conducted the same time and usually require some amount of moving back and forth among the levels of analysis. The sources for each of these analyses, as found in Tables 4-1, 4-3, and 4-8, have a great deal of overlap. For example, if you were interviewing incumbents regarding operational analysis, you would at the same time obtain information regarding roadblocks to getting the job done, which is part of the organizational analysis. When you examine the performance data for the person analysis, it is useful to determine any structural reasons for the poor performance, which is part of the organizational analysis. This gathering of multiple levels of information at one time is again illustrated in the Fabrics, Inc. example at the end of this chapter.

Once the operational analysis data determine the KSAs for the job, the person analysis will determine whether each of the relevant employees possesses these KSAs. For those who do not,

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Table 4-11 Examples of Attitude Questions

Attitudes toward Empowerment	
Please indicate the degree to which you agree or disagree with the following statements	
1 = Strongly disagree	
2 = Disagree	
3 = Neither agree nor disagree	
4 = Agree	
5 = Strongly agree	
1. Empowering employees is just another way to get more work done with fewer people. [Reverse scored]	1 2 3 4 5
2. Empowering employees allows everyone to contribute their ideas for the betterment of the company.	1 2 3 4 5
3. The empowerment program improved my relationship with my supervisor.	1 2 3 4 5
4. Empowerment brought more meaning to my life at this company.	1 2 3 4 5
5. Empowerment interventions should be introduced in other plants in this company.	1 2 3 4 5
6. The empowerment process provided a positive influence in labor-management relations.	1 2 3 4 5

the PG between what is required and what the employee has serves as the impetus for designing and developing necessary training.

For the TNA to be effective, it is important that employee development be of high concern to both the individual and the organization. This is more likely to occur when an organization does the following:

- Puts procedures in place that allow for developmental appraisals to take place regularly and separately from appraisals used for other personnel decisions
- Allows the individual to provide input into the process through self-appraisal
- Places a high value on developing subordinates by rewarding supervisors who spend time doing so
- Provides systematic opportunities for employees to receive the training and mentoring necessary for development

Although having these procedures in place will serve the organization well, it is still not enough! Numerous stories recount supervisors who simply go through the motions of a performance appraisal and employee development and then get on with the "real work." Such attitudes on the part of supervisors are likely to undermine any employee development system. Subordinates' perceptions of the process must also be positive, and they must believe that training will be useful in their development, particularly when self-assessment is being used in the TNA.¹⁸

Recall from the analysis phase of the training model that the organizational, operational, and person analyses are the inputs. The process is the identification of the gap, which is done by comparing the AP with the EP. The resulting PGs become the output of the TNA.

Output of TNA

As noted in the training model at the start of the chapter, outputs include both training and nontraining needs. Training needs are dealt with by designing appropriate training programs, which are discussed in **Chapter 5** . Here, we examine nontraining needs.

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Nontraining Needs

Nontraining needs include those that show no gap in required KSAs and those characterized by a KSA gap but for which training is not the best solution. First, let's examine those that show no KSA deficiency, as depicted in Figure 4-1.

Nontraining Needs That Have No KSA Gap

These PGs are not a result of a lack of KSAs, but a result of the following:

- Performance consequence incongruence
- Inadequate or inappropriate feedback
- Barriers to performance in the system

No amount of KSA development will improve performance in situations where these PGs exist. The causes of these PGs will be uncovered in the organizational and operational analysis.

Performance Consequence Incongruence

Can working at the expected level of performance be punishing? The answer is yes, it can. Consider Nancy, the employee who always has her work done on time and done well. The other three employees in the department often complete assignments late, and their work tends to be done sloppily. Now the supervisor has a very difficult assignment that must be done in record time. Whoever gets the job will need to work late for the next few weeks. Who is assigned to the job? Nancy, of course. Nancy's reward for being a good performer is to get the difficult assignments that require staying late to complete. Soon Nancy catches on and begins acting more like the rest of the employees in her department. When Nancy is not working at the expected level, providing her with training will not help. Her lower performance is not a KSA problem. So, although training for Nancy will not help, training her supervisor how to motivate all department employees might be useful. It would also be useful to have systems in place to motivate the supervisor to reward employees appropriately.

Inadequate or Inappropriate Feedback

Another nontraining need comes from employees not receiving appropriate feedback. Numerous examples tell of employees who believe they are good performers, but their supervisors believe otherwise. Supervisors generally dislike providing negative feedback.¹⁴ In fact, some suggest that it is the most disliked of all managerial activities.¹⁵ So they simply do not say anything to the employees. Once again, the problem is not a training issue for the subordinate, but it could be for the supervisor.

Barriers to Performance

Conditions in the workplace that obstruct the desired performance level are a third reason for deficiencies in performance. Receiving material too late, using worn-out machinery, and being constantly interrupted are but a few of the possibilities that could hinder performance. Once identified, these roadblocks need to be removed, a complex task that, in some cases, might require high-level support. Suppose a supervisor has too many reports to file each week and this responsibility takes away from the time needed to help subordinates; however, middle management needs these reports. The only way to reduce the amount of paperwork is to request that middle management reduce the number of reports they receive or find another way to generate them. This problem is not an easy one to solve, but as you can see, providing the supervisor with training related to helping subordinates will not solve the problem.

Non Training Solution Choices for a KSA Gap

Nontraining needs can exist where a gap in required KSAs is also present as shown in Figure 4-1. As noted in the figure, the nontraining causes of the performance gap need to be corrected before any solutions to the KSA deficiency can be effective. After all nontraining causes of the PG have been corrected, then using Figure 4-1, the answer to each of the first three questions is "no," and you can move on to the question of whether there is a gap in KSAs. Note that training is not always the appropriate solution to a KSA gap. Other solutions are discussed next.

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4-5

Training in Action

Training Is Not Always the Answer: So Do a TNA First

A few years back, a *Fortune* 500 durable goods manufacturer decided to increase its design engineer complement by about 40 employees. They wanted to get these new hires up to speed as quickly as possible, so they called Bill Stetar, president of Performance Technology Group, to assist in the development of an appropriate training package.

On arrival at the company, Bill learned that the company had already decided that the training should consist of a series of lectures and seminars and other formal learning processes. However, Bill suggested that before deciding to use a particular type of training, it would be useful to do a TNA. The company was initially reluctant to do a TNA because they wanted to get the training set up as quickly as possible. However, Bill was able to convince them that it would be a useful step.

The TNA indicated that much of the required learning could be completed without any formal classroom training. Instead, job aids (task-specific job instructions) and supplementary self-help information was put online for access by the new hires at their convenience. Much of it was related to

- what the person needed to do,
- how to do it (self-help instructions were provided), and
- where to go for help if you needed it.

The results were that new hires got up to speed faster, made fewer mistakes than in prior years, and did not have to spend any time in the classroom.

How much did the company save? Well first of all, they saved approximately 50 percent of what they had originally budgeted for the training. But there was more. Learning of the material was faster. Management expected it to take about 90 days for a new engineer to be up to speed; it only took on average about 45 days. Without the TNA, traditional training clearly would have been less efficient. So, as Bill would say: "Training is not always the answer, do a TNA first."

Source: By permission of Bill Stetar.

Job Aids

A job aid is a set of instructions, diagrams, or other form of providing information that is available at the job site. Its purpose is to provide guidance to the worker. A job aid is useful if the worker's task is complex, if it requires a number of steps, or if it is dangerous to forget a step. Airline pilots use job aids—a list of things they must do prior to takeoff—so that they do not forget any of the steps required. Another example of a job aid would be a diagram. Rather than teaching someone a number of steps in wiring an automobile, a picture depicting where the wires should go should suffice. It is often cheaper and more efficient to use job aids when practical, rather than developing elaborate training packages, as Bill Stetar notes in *Training in Action* 4-5.

Practice with Coaching

Regarding tasks that are important but are performed infrequently, employees can easily forget or become less proficient at them. For this reason, police officers are required to practice on the firing range each month. Schools conduct fire drills as practice for an important incident that might never occur. In these cases, providing the practice is meant to prevent a PG. If a PG in an infrequently performed task is discovered, periodic practice sessions with coaching should be considered to ensure that the gap does not continue to occur, particularly if its occurrence can have serious consequences. If the skill has been lost, a coach is needed to provide the guidance to regain the skill. In addition, having a coach work with the person, helps speed the acquisition of the desired performance level. This is discussed at greater length in *Chapter 6*.

Redesign the Job

This approach might seem extreme, but it is sometimes worth considering. Several years ago, salespeople in automobile dealerships were completely responsible for the job of selling a car, from meeting the customer through to closing the deal. The most difficult part of selling is closing the deal, which requires certain KSAs that are difficult to impart through training. As a result, many car salespeople did not last long in the business. This deficiency led the dealers to change the job. They provided the salesperson with the skills to show the car, discuss various options, and negotiate to a certain extent. Then, when it came to closing the deal, the salesperson could send the customer to the sales manager. Thus, the job was changed so that the salesperson no longer needed to know how to close the deal.

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Termination or Transfer

Sometimes neither training or any of the other options we've discussed are the best answer to eliminating the PG. Sometimes it is necessary to remove the employees from the job. If lack of motivation is the reason for the PG, and the employee has been given ample opportunity to improve, then termination needs to be considered. If it is that the employee is unable to grasp the KSAs necessary to do the job, then transfer to a more suitable job may be the answer.

Training Needs

For those PGs that result from the employees' lack of KSAs, and for which training is a solution, the KSAs need to be listed and described clearly and unambiguously. These KSAs will be used to develop training objectives (discussed in detail in Chapter 5).

It is important to understand that in most cases, even if a training need is identified, nontraining needs are usually also present. We cannot emphasize enough the importance of these nontraining factors. Even if training results in the employee gaining the required competencies, these will not be used on the job, unless any nontraining causes of the performance gap have been removed. For training to be successful and transferred to the job, these "nontraining" factors must be aligned with the training and the desired employee performance. As Robert Brinkerhoff, an internationally recognized expert in training effectiveness said,

The reality is that these non-training factors are the principle determinants [for transfer of training], if they are not aligned and integrated they will easily overwhelm the very best training [inhibit transfer] Best estimates are that 80 percent or more of the eventual impact of training is determined by performance systems factors [nontraining needs] * (p

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304)

Approaches to TNA

Now that we have examined the general approach of conducting a TNA, we examine more closely the distinction between proactive and reactive approaches.

Proactive TNA

The proactive TNA focuses on future HR requirements. From the unit objectives resulting from the organization's strategic planning process, HR must develop unit strategies and tactics (see **Figure 2-1** on page

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28) to ensure that the organization has employees with the required KSAs in all of its critical jobs. Two approaches can be taken to develop the needed KSAs:

1. Prepare employees for promotions or transfers to different jobs.
2. Prepare employees for changes in their current jobs.

An effective, proactive procedure used for planning key promotions and transfers is succession planning. Succession planning is the identification and development of employees perceived to be of high potential so they can fill key positions in the company as they become vacant. The first step in the development of a succession plan is to identify key positions in the organization. These positions, if left vacant for any length of time, would affect organizational functioning negatively. In practice, these positions are often high-level management positions such as vice president of finance or plant manager, but they could be at any level (e.g., mold maker, if the position is key to the operation and difficult to fill). Once the key positions are identified, employees with the potential to fill these key positions are identified. Then information is provided on employees' readiness to fill the position if it becomes vacant. Employee readiness, of course, is the difference between what is expected in the new job versus what the employee is currently capable of doing. Organizations with this type of system in place have a ready-made TNA.

When preparing employees for changes in their current jobs, it is important that the TNA identify the expected changes in performance. Once the performance expectations are determined, the new KSAs required for that job can then be identified. These future KSAs are compared with the incumbent's current KSAs, and any resulting PGs are addressed through training. Consider Heinz in Leamington, Ontario (see Table 4-6) When they determined that they would be moving to a high-tech ketchup machine, it was necessary to determine what KSAs would be necessary to operate it. Training in these KSAs occurred *before* the new equipment was in place.

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Organizational Analysis

The proactive approach starts with expected changes and any new objectives. As an analyst, try to determine the best fit between the organization's current internal environment (structures, policies, procedures, etc.) and future expectations and objectives. As an example, questions regarding the formal structure might include the following:

- Are pay practices congruent with the new direction taken by the company? Example: Would a strict hourly pay structure fit if the plan were to treat each department as entrepreneurial?
- Is the emphasis of the new priorities congruent with the performance appraisal system? Example: If the priority is quality, does the performance appraisal have a dimension to measure this?
- Is the strategy congruent with the current practices? Example: The new strategy is to move to a more positive union-management relationship. Currently, a policy does not allow any union business to be conducted on company time. Should this policy be revisited?
- Are enough employees available to accomplish the objective? Example: The plan is to improve quality to meet ISO 9000 standards, but employees are constantly rushed because of a lack of personnel. Does the company need to consider massive hiring or training of current employees?

Informal procedures might be evaluated with the following questions:

- Do norms that would restrict output exist?
- Will workers believe that changes in performance are required?
- What formal procedures are short-circuited by informal procedures, and what are the implications (perhaps the formal procedure is inappropriate)?

These questions need to be asked at all levels in the organization, but specifically at the departmental level, where more meaningful data will be found. Often, those in higher levels of management take a different view of the effect of various policies on behavior.

Operational Analysis

Job analysts gather information not only on what tasks are carried out currently, but also on what tasks will be required in the future. **Strategic job analysis** is defined as the identification of the KSAs required for effective performance in a job as it is expected to exist in the future.⁴⁹ Data gathering is identical to that in traditional job analysis, with the addition of a section called "gather information on the future." For this section, it is necessary to look at changes in areas such as societal values, political and legal issues, economics, market, labor, and technology, and also how those changes would affect the job in question. In this case, input from more than just incumbents and supervisors is necessary. Information from the following people is necessary:⁴⁹

- At least one person involved in corporate strategy and closely tied to the job in question
- Someone who is aware of how the competition structures the job (technologically and from an HR standpoint)
- An efficiency expert (internal technology/communication expert)
- Someone who worked his way up through the job in question
- A forward-thinking incumbent (one willing to suggest new ideas)

This list is not exhaustive and serves only as a guide. Once these data are gathered, a revision of the tasks and KSAs based on these changes can be determined. The training function then uses this information, coupled with person analysis, to determine future training needs. The previous discussion about what to do if no job incumbents are available is helpful here. In reality, no job incumbents exist if the job will change in substantial ways.

At first this task might seem rather daunting; however, it does not need to be. The first step is to identify the critical jobs. For example, if the primary function of the organization is writing software, the computer programmer's job will be more critical to the effectiveness of the organization than the file clerk's and should be examined first. Likewise, if the organization is making parts for the automotive industry, mold making might be a critical job.

Person Analysis

Assessment of the person (for the required KSAs) is identical for both the proactive or reactive TNA, so the information presented earlier on person analysis is applicable.

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Let's do it

In the Multistate Health Corporation (MHC) at the end of **Chapter 2**, a strategic plan was outlined, and from it a number of potential objectives were developed for HR related to developing a human resource planning system (HRPS). The main focus of the HRIS objectives was that MHC was having financial problems, and it seemed as if the trouble could be traced to the competency of the chief executive officers (CEOs) at their hospitals. Unfortunately, no clear documentation exists describing the required KSAs for the 30 CEOs; as a result, no one knows the KSAs needed to be successful or to be promoted to CEO. To deal with this lack of KSA documentation for CEOs and other key positions in the organization, the MHC executive committee developed six objectives. The first step in addressing these objectives (as they affect the position of CEO) is to conduct an operational analysis of the CEO position. Recall how the job analysis was conducted for the large computer firm (Table 4-4). You could use a similar process here and conduct interviews, given the small number of incumbents. You can interview all incumbents (four or five small group meetings), or hold one meeting with six CEOs: two from each region, one from the largest and one from the smallest hospital in that region.

At the meeting, ask the CEOs to list all the tasks and subtasks they perform, or prepare a partial list from previous conversations to use the time available most efficiently. Then, using a scale similar to the one in Table 4-4, ask each of them to rate each task on its importance for the job. On the basis of the ratings provided, determine which are important. You need to examine these tasks to determine whether any differences distinguish between geographical locations or large versus small hospitals. If any differences are noted, they need to be resolved. If a large number of critical tasks are different, the jobs themselves could be different and may need different titles. It might also be that the task was not identified as important by some because it never was required. The task of "effective cost cutting" might not have been identified in some smaller hospitals because it was not used. It is still an important task for CEOs (assuming that CEOs in larger hospitals indicated it as important), and would be included, although some CEOs might not have the KSAs to do it effectively, as noted in the case. Once you identify all the tasks, it is useful to classify them into broader duties, as outlined in **Figure 4-3**.

Next, you need to identify the KSAs necessary to perform each task. These KSAs will be used to make either selection or training decisions, depending on where they were classified concerning "need at the time of hire." Publishing the ones required at the time of hire for the recruitment process makes the selection criteria clearer to all.

A team of subject matter experts on the position of CEO (see the discussion of strategic job analysis in "Operational Analysis" of the preceding selection) should be consulted to develop the strategic part of the job analysis (how the job might look in five years). This information, when compared with the information on current requirements, highlights what the future requirements would likely be. At this point, executive development programs could be put in place to develop the KSAs needed for the future job of CEO at MHC.

Let's look at one duty. From the job analysis, one duty might be defined as the "development of subordinates." You might identify the following tasks related to that duty:

- Initiates action to identify developmental needs
- Provides timely feedback to help subordinates improve
- Provides subordinates with opportunities to develop
- Meets with subordinates to discuss performance and development
- Coaches subordinates in a manner that allows them to improve their skills

Several other duties (and relevant tasks) would, of course, be identified. Finally, the KSAs necessary to perform the tasks would be identified. From the preceding list of tasks, KSAs that would be relevant include the following:

- Knowledge of the performance review process
- Knowledge of basic coaching skills
- Skill at providing feedback in an effective manner
- Skill at interviewing
- Positive attitude toward the participative approach to problem solving
- Positive attitude toward helping others

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Based on the assessment of the skills of the 30 CEOs at MHC, some or all of these KSAs might be lacking, and training might be necessary. To determine which CEOs need which KSAs, the person analysis is conducted.

For the person analysis, let's just focus on the specific KSAs necessary to appraise performance. Here you want to know about CEOs' knowledge of the appraisal process and their skill in providing effective reviews. This information is obtained in part by asking CEOs directly (a subpart of your job analysis meeting). If managers have no confidence in a performance appraisal system, they will have no compunction about telling you that "it's not worth the time" or "it's never used anyway so why bother." If they do not believe that they have the skill, they might also tell you that. Another place to obtain such information is from the CEOs' subordinates. You might get information from the CEOs' subordinates such as "She really tries to do a good job but is constantly telling me what I need to do and never asks my opinion" or "He tells me I have a bad attitude. I'm not sure what he means but am in no mood to ask either." These types of comments suggest a lack of skills on the CEO's part, or it is possible that the CEO has a negative attitude toward the process. Again, asking the CEO directly could determine which it is. You can also use the option of behavior testing to assess the skills. Put CEOs in a role-play situation where they must provide feedback to an employee, and score them on how well they do.

For the organizational analysis part of the TNA, some information has already been gathered from interviews conducted by the consultants. One of the objectives based on those findings was the inclusion of a succession plan. It provides the mechanism for supplying instant information on who should be considered for the next promotion, rather than relying on individual CEOs to make that determination. Of course, you need a standardized performance review system in place to make such determinations.

The job analysis provides relevant data for developing standard performance appraisals necessary in both promotion and developmental decisions. With such a system in place, each CEO would be responsible for completing performance reviews on his subordinates and providing developmental plans for them. This process would help address the lack of interest in some CEOs for recommending their subordinates. Although not explicitly noted, one important measure of the CEOs' performance appraisal would need to be how well CEOs prepare and develop their subordinates for promotion. This measure, specifically as part of their performance review, along with the use of a succession plan in general, will serve to encourage all CEOs to work toward developing their subordinates for promotion.

Reactive TNA

The reactive TNA begins with an existing discrepancy in job performance. In this sense, [Figure 4-1](#) represents a more complete picture of the reactive process. A middle manager might notice that production is dropping, a supervisor might see that a particular employee's performance has declined, or HR might note an increase in grievances from a particular department. Once you identify a performance gap, you need to determine whether it is worth fixing. Although this decision may be based on financial implications, it does not have to be. For example, the company notes that one department has lower ratings of supervisory consideration (as rated by subordinates) than the organization expected. The cost of this lower rating would be difficult to assess. It might take a long time (if ever) to notice any significant effect on the company's bottom line. If the company makes a strong commitment to developing a good employee-management relationship, it may decide to try to alleviate the problem.

In the reactive TNA, you still conduct the organizational analysis, operational analysis, and person analysis, but the distinction among them is even more blurred, for the following reasons:

- The focus is primarily on the one department.
- Those who demonstrate the discrepancy (and their peers and subordinates) are the key persons to be interviewed about all three components.
- The discrepancy focuses the issue on a particular part of the job (e.g., interactions with subordinates, as previously noted).

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Organizational Analysis

Organizational analysis can uncover the three issues identified earlier the KSA gap in Figure 4-1 (Incongruent Consequences, Feedback Problems, and Performance Barriers). Once the decision has been made that there is a positive cost/benefit to fixing the PG, a complete analysis of all causes of the PG is needed. Even if a lack of KSAs is identified as a problem, additional roadblocks might exist that would prevent performance even if the KSAs were learned.

Operational Analysis/Person Analysis

In the reactive approach, the performance discrepancy is already identified; it triggers the analysis. Operational and person analyses are aimed at identifying the cause of the current gap between EP and AP. These analyses are conducted in a manner consistent with our earlier descriptions. Note that the operational analysis may also uncover performance barriers that were not visible at the organizational level.

Let's do it

When a reactive performance gap is identified, it is best to work from the gap and deal only with those issues indicated from the gap analysis. Instead of moving step by step through this analysis, let's look at Training in Action 4-6, an actual example of this process.

4-6

Training in Action

Where Do You Start When You Have a Performance Gap?

Students in a training and development class decided that for their class project, they would like to determine why some professors are interesting and informative, whereas others are not. The needs analysis of this performance gap (PG) would help determine whether the issue is training or something else.

They examined the PG using operational analysis (expected performance) and person analysis (actual performance). As is noted in Table 4-3, one way of obtaining expected performance data is to observe the job. The group of students had observed the job (lecturing) of professors for two years, and also using data from other students they interviewed, they developed a list of behaviors that they believed made lectures interesting and informative.

For person analysis (actual performance), the students used observation and performance data (see Table 4-7). Using the observation method, the students identified six professors who were considered as having a performance discrepancy. These data were compared with OTHER performance data (published student surveys) about the professors' teaching skills, which verified the observations. An attempt to verify this information further was made by asking the dean to provide student (customer) complaints about professors over the past two years. The dean declined to provide such information.

The organizational analysis was then conducted. Because of the nature of the PG (only business school professors were identified), the organizational analysis focused primarily on the business school. Examining the university-wide mission and other documents was not necessary. From Figure 4-1, questions about the performance consequence incongruence, inadequate feedback, and barriers to performance in the system were examined. This was done through an interview (management interrogation as noted in Table 4-1) with the dean of the business school. Questions related to adequate feedback were as follows: (1) Are there other performance ratings of professors? (2) Do the professors receive feedback on their performance? The dean's answer was that the only measure of their teaching performance is student surveys and any unsolicited complaints from students. Regarding feedback, the professors receive the student evaluations along with a ranking of themselves and all other faculty members based on these data. Any student complaints would also be made available to the professor. The dean noted that the same professors tended to be rated low each year but again declined to provide specifics. A question related to performance consequence incongruence was as follows: What happens to those who are rated high and low? The answer was nothing; there are no extrinsic rewards or punishment for being a good or poor teacher. Finally, in response to a question about performance barriers in the system, the dean emphasized the pressure for publications. "Publish or perish" were the words he used. Promotions, tenure, travel, and other rewards were all provided to those who were publishing on a regular basis. These were the overall findings of the needs assessment.

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From the information provided in Training in Action 4-6, will training help? You cannot really determine the answer yet, although some factors identified suggest that few external forces are acting on the professors to change their teaching.

Let's suppose that you did talk to the professors, and they told you that they always teach this way and suggested that their job was not to entertain, but to teach. Through some subtle questioning, you determine that they do not seem to understand some basic skills about making a lecture interesting and effective. They evaded questions about how an effective slide show should be set up, how questions can be used to create interest, and so on. Thus a KSA deficit is revealed. Would training alone be enough? It might, if the training were designed in a way that was interesting and it motivated the professors to go back to the classroom to try some different ideas. They would more likely try these new ways of teaching if organizational changes were made that encouraged them to improve. For example, when they reached an average on teacher evaluations of 3.5 on a 5-point scale, the professors could be offered a bonus (in the form of travel money or computer equipment if a cash bonus were not possible). Changes in the way pay increases are offered, with heavier emphasis on the importance of student evaluations in getting tenure or promotion, would encourage professors to be more concerned about their teaching. Even personal interest by the dean could be effective. The dean might meet with the professor and indicate a concern with the performance; they could set goals for improvement and then meet on a regular basis to encourage the change. All these changes, combined with a well-designed training program that would also motivate the professors, should result in an improvement.

Reactive versus Proactive

From a systems perspective, it makes sense that a proactive approach would be better than a reactive approach. Obviously, anticipating needs is better than waiting until they cause problems. Companies that integrate the training function with strategic objectives are more readily able to respond to the rapidly changing technology and business conditions that are an everyday part of corporate life.⁴¹ However, even when operating proactively, the organization will at times need to react to changes in the environment. Strategic plans are not cast in concrete but must be adapted to current events. Using a combination of proactive and reactive strategies allows an organization to be most effective. It is, in fact, possible that a proactive approach is more important for market leader organizations than for cost leader organizations.⁴² Market leaders need to be much more aware of their environment and anticipate how they will respond to that environment; otherwise, they will not survive.⁴³ In reality, however, many organizations operate from a reactive perspective when it comes to training.

Focus on Small Business

Some suggest that the small business is not simply a miniature large organization but a unique entity in itself.⁴⁴ So what is true for large organizations might not be relevant for small ones. This assessment might be true in some areas but not necessarily in the area of HR practices. Research has shown that small firms with high-quality HR practices are generally higher performers than those without such practices.⁴⁵ Also, small firms with higher amounts of training consistently demonstrate more innovativeness than those with lower levels of training.⁴⁶ What is unique about the small firm is that the HR procedures that management decides to implement are likely much more critical (compared with the large organization) because errors in judgment that create challenges for large companies (such as the building of the Edsel car by Ford) could destroy a small business. Therefore, the proactive approach to training would seem to be more important for the small business. Furthermore, in smaller organizations, it is easier to integrate a proactive approach because fewer employees are involved.

The top management of a small business is usually the owner, who is usually responsible for any training.⁴⁷ However, this person likely does not have any HR background and might not understand how a proactive approach to training can be advantageous.⁴⁸ In fact, much

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4-7

Training in Action

69 Training: Where is the Return?

Metro Tool & Die of Mississauga, Ontario, Canada, has 42 employees, most of whom have little education or training. Mr. Pantano, the owner, was interested in improving the quality and efficiency of his shop. He contacted Fabian Hogan, a consultant with the Ontario Skills Development Ministry. After an assessment, Mr. Hogan suggested that all employees receive training in basic literacy skills, blueprint reading, and instrumentation die setup. Doing this would entail a considerable expense, but the consultant convinced Mr. Pantano that the investment was, in the long term, a good one. At 3:30 every day, training sessions were held on company premises and company time. Was this commitment to training worthwhile? Since completion of the training, rejects dropped from 7,500 per million to 325 per million. The company won the prestigious Xerox Quality Award in a worldwide competition. Metro recently provided one of its customers with a \$9,600 cost savings. In the owner's own words, "Training has paid for itself. There is no tool and die company like us. We are a small company using big-company tactics."

That was in the early 1990s. Today, the company has grown to 100 skilled employees, and their market expanded from business machines to the auto industry, appliances, computers, etc., and they have clients all over the world. They have become ISO 9000 and QS 9000 certified. These certifications were very time consuming and costly in terms of training, but as Anna Pantano said, "We are committed to having a highly trained workforce. One of our niches is being able to meet unreasonable deadlines and last minute changes to specs, while still meeting deadlines. This is accomplished because we believe in cross-training and have a number of our employees capable in more than one operation, making us very adaptable to last minute changes by our customers. On top of that each employee must receive a specific amount of training each year. Without the training commitment we have, that simply would not be possible."

of the dissatisfaction with training in the small business sector is a function of the reactive approach, which responds to a crisis with a "quick fix." The small business owner/manager needs to realize that sound training practices tied to the strategic plan will pay off in the long run, as Metro Tool & Die discovered in *Training in Action* 4-7.

Other evidence indicates that more small manufacturing businesses are undertaking TNA. One reason for this is the wish to become ISO certified. David Alcock works for the Canadian Plastics Training Centre (CPTC) in Toronto, which provides training to many of the small mold-making companies in the region. He says that because of the investment required in becoming ISO certified, companies are requesting a TNA to obtain the maximum effect for their training dollars. He noted that in the last few years, more than half of the company's customers, many of which are small businesses, requested a TNA.

The time factor is always a concern for any business, but particularly for small business. For small business, the TNA often seems a waste of time. Techniques can speed up the process of working through a TNA, but generally these techniques require using a trained analyst to be effective. Here are some tips for the small business HR person or manager to consider when faced with conducting a TNA:

- Be clear on what is to be done.
- Examine existing available data.
- Develop some ideas related to the issue and test them in the data gathering.
- Collapse the steps.
- Use technology.

The most important thing is to clarify what type of OPG you have, and then map out a plan of what to do for the TNA before venturing out to do it. Examine records, minutes, and any other documentation related to the gap. Determine who needs to be talked to and what questions will need to be asked. (A reexamination of Tables 4-1 and 4-2 might be helpful here.) Sometimes it is difficult to help employees understand exactly what is being sought.

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Consider Fred, the only salesperson in the organization who consistently gets letters of praise from customers and high repeat business. When Fred is asked what he does that makes him so successful, his response is, "I do not know, I just treat them well." To explore this more, outline a scenario that you think might be correct. Such a scenario might look like this: When customers come in, Bill greets them by name, asks about the family, asks questions about themselves, then asks what he can do for them today, and so forth. Once Fred hears the scenario, he can correct or amend it so the scenario fits what he actually does. You provided Fred with a template from which to provide information to you. Clearly, one way to speed up the process is to collapse the steps. For example, meet with everyone at once and give them a possible solution to the problem. Now ask for candid responses to questions such as, "Is this an adequate description of the problem? Is the proposed solution the best one? What would you do differently?" or "What would prevent the successful implementation of this solution?" Of course, it is necessary to be sure that everyone at the meeting is willing to be open and honest. Finally, the use of e-mail, discussion boards, and so forth, can help to gather information from several employees, with minimum time spent actually meeting them. Place the problem or issue on a discussion board and ask for comments. Return to it from time to time to review comments and questions and pose new or follow-up questions. E-mail is also a way of soliciting input. Simply get a group on an e-mail list, and conduct meetings using the technology.

However, problems can arise when you do not do the full TNA, which can lead to less-than-ideal solutions. Still, the shortcut is better than not doing a TNA at all. Often the ramifications of not doing a TNA are time and money wasted on things unrelated to solving the problem. Even for a small business, it is important to do something, rather than nothing, even if it is less than ideal.

Assistance for Small Business

Small-business owners can access resources to aid them in training their employees. The different levels of government assist in various ways to help fund training. For example, most states have small business development centers (SBDCs) that provide assistance in training. In California, customized training programs assist companies in becoming ISO certified and are available from the California State Department of Education at no cost. Instructors with factory experience conduct a TNA and develop training on the basis of the analysis, making the training organization-specific. As a result, employees can see its advantages to their job. The major hurdle to these programs is convincing management of their value. Also, the training must be integrated into the overall plan of the organization, or it is not successful.

When the small business does not have time or expertise, government-sponsored consultants can provide support. Furthermore, in most universities, graduate students in psychology or business would welcome the opportunity to become involved. These individuals often operate under the watchful eye of highly trained professors and are willing to do the work, at a fraction of the cost a professional would charge, simply for the experience. In fact, if the situation provided research possibilities, the project might be done for free. Moreover, many business schools have professional training consultants associated with their continuing education or executive education programs who also provide seminars and/or consulting. For those who argue that small businesses simply cannot afford the time to do a comprehensive TNA, we argue the opposite; they cannot afford not to. It is better to do something rather than nothing.

TNA and Design

We return now to the opening case, Westcan. Remember that Chris was all set to begin developing an "effective meeting" training program. As you read the rest of the case, think about the things you learned about conducting a TNA. Note that the TNA Westcan uses is much simpler and less formal than some we discussed. However, the value of doing the TNA is quite obvious.

The needs assessment at Westcan shows that training was required but not the training that Chris first imagined. Her problem was that she did not have enough information to understand the types of needs the managers had. Without this information, she began to design what she

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thought would be a good "effective meeting" training session. What would have happened if she had gone ahead with her original plan? After conducting the TNA, she is now in a much better position to design an appropriate training program. The next step is to develop a clear set of training objectives that will drive both the design and evaluation of training. The importance of sound training objectives cannot be overstressed. **Chapter 5** provides a step-by-step procedure for developing these objectives and meshing them with training design issues and constraints.

Connection to Training Evaluation

One of the critical byproducts of identifying training needs is that you will have also identified the measures you will use for evaluating the effectiveness of training (did they acquire the KSAs they needed). This will be covered more thoroughly when we discuss the development of

Case Developing a Training Package at Westcan (Conclusion)

Chris told Karen about the conversation with Irven and what she had put together. Chris said, "What remains is to develop the simulation. Can you help?"

"Sure," said Karen, "but it's too bad you are so far along. I might have been able to help you design the training."

Chris indicated that she had not put a great deal of time into designing the training and was open to any suggestions.

Karen suggested that Chris consider doing a needs analysis. "In a way, you completed a partial operational analysis by determining what is required in running an effective meeting. What we do not know is where the managers are deficient; we call that a person analysis. One way to obtain that information is to ask the managers to describe how their meetings currently run and the areas they see as ineffective. Their answers should reflect the areas in which they are deficient. Also, by asking the managers what training they want, we could ensure that the training is relevant. Another method would be to sit in and observe how they run their meetings. It would allow us to identify performance and KSA gaps they might be unaware of," said Karen. Karen noted that in her brief time at Westcan, it seemed that premeeting information was well distributed and understood, agendas were given, and notice of meetings always contained the relevant information.

"You might be right," said Chris. "I simply never thought of asking them." Together they developed a questionnaire asking questions related to effective meetings, such as, "What would you like to see contained in a one-day effective meeting workshop?" and "How well do the meetings with your staff stay on track?" They also got permission to sit in on a number of meetings.

The returned surveys and meeting observations indicated that most managers understood the rules of effective meetings. All had, at one time or another, attended a lecture or read material on running an effective meeting. The problem was that they had never been able to turn the knowledge into action. They knew what to do, just not how to do it. They wanted practice, with feedback from a professional. They also wanted the training to be for the exact teams they continually operated in, which required that management and nonmanagement from a team attend the same training and learn the behaviors required for effective meetings together. After going through the TNA with Karen and documenting all the information, Chris said to Karen, "Well, it looks like the training I was going to provide was way off the mark compared with what we now know they need. I owe you a dinner."

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training objectives. However, a brief summary of the interconnections will be useful here to give you a framework as you move through the rest of the text. Once training needs have been identified and the organization decides that it will provide training to address them, the training design process begins. As stated earlier, the first step in that process is to develop the objectives for the training. The learning objectives will need to reflect the criteria that were used to determine that a training need existed (employee KSAs were deficient). These objectives then serve as the focus for the rest of the training process (design, development, implementation and evaluation). After the training is conducted, it needs to be evaluated. One of the most important evaluations is whether trainees learned what they needed to learn. The learning objectives specify how you will measure if learning occurred and you will use the same measures (and instruments) that were used to identify the KSAs that were training needs. So, there is a direct link between the KSAs you identify as training needs and those you evaluate at the end of training. For example, if you developed a multiple-choice test to assess needs, that test (or a similar one) would be used to evaluate learning. If you used role-plays to assess training needs, then these role-plays or very similar ones would be used to evaluate the learning.

Summary

Training is a reasonable solution when a PG is caused by an employee's lack of KSAs. However, most problems identified by managers as requiring training actually do not require training. Most such problems are a function of organizational barriers (reward/punishment incongruities, inadequate feedback, or system barriers) to performance. A TNA will reveal the location and reason for the problem.

When a gap in required KSAs creates a PG and training is required, the TNA ensures that the KSA deficiencies are identified. Training that is focused on these KSAs will be relevant and therefore more motivating for the trainees. The likelihood is higher that training will be successful when a TNA is conducted because

- the appropriate KSAs required to do the job are identified (operational analysis),
- the KSAs of the employees in that job are determined (person analysis) so that only those needing training are trained, and
- the roadblocks to transfer of the training are identified (organizational analysis) and removed.

The TNA consists of organizational, operational, and person analysis. The organizational analysis is designed to assess the capital resources, HR availability, and the work environment. It is important to understand the amount and type of resources available and what type of environment the affected employees work in. Often, employees are not performing at the expected level for reasons other than a lack of KSAs. The organizational analysis identifies these reasons so they can be rectified. Even where KSAs are the problem, other remedies (job aids, practice, and so forth) can be considered before training.

The operational analysis provides information pertaining to the KSA requirements for the job in question. Observing the job, doing the job, and examining job descriptions and specifications are some of the ways of determining this information. The method most often used, however, is to ask incumbents and supervisors what is required in a systematic way.

The person analysis provides information on each employee's specific level of competence regarding the KSA requirements. Several methods can be used to determine competence levels, such as examining performance appraisals, testing, or simply asking employees where they encounter problems. Each of these approaches offers advantages, and the one you choose depends on factors such as time and availability.

There are two types of TNA: proactive and reactive. With proactive TNA, the focus is on planned changes to jobs and performance expectations. Typically, these changes evolve from strategic planning, but also might occur from other processes. Because the proactive TNA anticipates future changes, it also must anticipate the KSAs required to meet or exceed performance expectations in the future. As a result, some of the types of information collected are different from those collected for the reactive TNA.

The reactive TNA is far more common and is a response to a current PG. Here, the TNA needs to be completed more quickly because the gap is already affecting productivity. An effective organization uses both proactive and reactive types of TNA.

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The Training Program (Fabrics, Inc.)

This section is the beginning of a step-by-step process for developing a training program for a small fabrications company. Here, we examine the TNA for the program, and in subsequent chapters, we will continue the process through to the evaluation.

Fabrics, Inc., once a small organization, recently experienced an incredible growth. Only two years ago, the owner was also the supervisor of 40 employees. Now it is a firm that employs more than 200. The fast growth proved good for some, with the opportunity for advancement. The owner called a consultant to help him with a few problems that emerged with the fast growth. "I seem to have trouble keeping my mold-makers and some other key employees," he said. "They are in demand, and although I am competitive regarding money, I think the new supervisors are not treating them well. Also, I received some complaints from customers about the way supervisors talk to them. The supervisors were all promoted from within, without any formal training in supervising employees. They know their stuff regarding the work the employees are doing, so they are able to help employees who are having problems. However, they seem to get into arguments easily, and I hear a lot of yelling going on in the plant. When we were smaller, I looked after the supervisory responsibilities myself and never found a reason to yell at the employees, so I think the supervisors need some training in effective ways to deal with employees. I only have nine supervisors—could you give them some sort of training to be better?"

The consultant responded, "If you want to be sure that we deal with the problem, it would be useful to determine what issues are creating the problems and, from that, recommend a course of action."

"Actually, I talked to a few other vendors and they indicate they have some traditional basic supervisor training packages that would fit our needs and, therefore, they could start right away. I really want this fixed fast," the owner said.

"Well, I can understand that, but you do want to be sure that the training you get is relevant to the problems you experienced; otherwise, it is a waste of money. How about I simply contract to do a training needs analysis and give you a report of the findings? Then, based on this information, you can decide whether any of the other vendors or the training I can provide best fits your needs in terms of relevancy and cost. That way, you are assured that any training you purchase will be relevant," said the consultant.

"How long would that take?" the owner asked.

"It requires that I talk to you in a bit more detail, as well as to those involved; some of the supervisors and subordinates. If they are readily available I would be done this week, with a report going to you early next week," the consultant replied. The owner asked how much it would cost, and after negotiating for 15 minutes, agreed to the project. They returned to the office to write up the contract for a needs analysis.

The interview with the owner (who was also the manager of all the first-line supervisors) was scheduled first and included an organizational and operational analysis. What follows is an edited version of the questions related to the organizational analysis.

The Interview

Direction of the Organization

Q: What is the mission of the company? What are the goals employees should be working for?

A: I do not really have time for that kind of stuff. I have to keep the organization running.

Q: If there is no mission, how do employees understand what the focus of their job should be?

A: They understand that they need to do their jobs.

Q: What about goals or objectives?

A: Again, I do not have the time for that, and I have never needed such stuff in the past.

Q: That may be true, but you are much larger now and do need to communicate these things in some fashion. How do employees know what to focus on: quality, quantity, customer service, keeping costs down?

A: All of those things are important, but I get your point. I never actually indicated anything about this to them. I simply took it for granted that they understood it.

Q: What type of management style do you want supervisors to have, and how do you promote that?

A: I assumed that they would supervise like me. I always listened to them when they were workers. I believe in treating everyone with dignity and respect and expect others to do the same. I do not have any method to transmit that except to follow my style.

HR Systems

1. Q: What criteria are used to select, transfer, and promote individuals?

2. A: I hired a firm to do all the hiring for me when I was expanding. I told them I wanted qualified workers. As for the promotion to supervisor, I picked the best workers.

3. Q: Best how? What criteria were you using?

4. A: Well, I picked those who were the hardest workers, the ones who always turned out the best work the fastest, and were always willing to work late to get the job done.

5. Q: Are there formal appraisal systems? If yes, what is the information used for promotion, bonuses, and so forth?

6. A: I do not have time for that. I believe that people generally know when they are doing a good job. If they are not, I will not keep them.

Job Design

1. Q: How are supervisors' jobs organized? Where do they get their information and where does it go?

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A: Supervisors receive the orders for each day at the beginning of the day and then give it out to the relevant workers. They then keep track of it to see that it is done on time and out to the customer.

Reward Systems

1. Q: What incentives are in place to encourage employees to work toward the success of the organization?
2. A: Well, I think I pay them well.
3. Q: Does everyone receive the same amount of pay?
4. A: At the present time, yes, because they are all relatively new supervisors. I do plan to give them raises based on how well they are performing.
5. Q: But you indicated that you do not really have a method of informing them what you are measuring them on. How are they to know what is important?
6. A: Well, I will tell them. I guess I need to be considering that issue down the road.

Performance

1. Q: How do the supervisors know what their role is in the company?
2. A: I told them that they needed to supervise the employees and what that entailed.
3. Q: How do they find out how well they are doing in their job? Is there a formal feedback process?
4. A: I talk to them about how they are doing from time to time, but I get your point and will think about that.
5. Q: Are there opportunities for help if they are having problems?
6. A: Take this problem with the yelling and getting employees angry at them. I have talked to them about it and have offered to get them training.
7. Q: How do they feel about that?
8. A: Actually, they thought it was great. As I said, none of these supervisors have had anything in the way of supervisory training.

Methods and Practices

1. Q: What are the policies, procedures, and rules in the organization? In your view, how do they facilitate or inhibit performance?
2. A: I really do not think there is anything hindering their performance. I am always willing to help, but I also have work to do. That is why I promoted employees to supervisors, so I would not have to deal with that part of the business. After gathering information on the organization, the consultant gathered operational analysis data from the manager (owner). The consultant used the method provided in Figure 4-3 . What follows is a portion of the completed form.

<i>JOB TITLE: SUPERVISOR</i>		<i>SPECIFIC DUTY: BE SURE WORK IS COMPLETED AND SENT TO THE CUSTOMER ON TIME</i>
<i>Tasks</i>	<i>Subtasks</i>	<i>KSAs</i>
organize jobs in manner that ensures completion on time	Examine jobs and assess time required	Knowledge of types of jobs we get Knowledge of times required for jobs to be completed
	Sort and give jobs to appropriate employees	Organization and prioritizing skills Knowledge of employees' capabilities
Monitor progress of work	talk to employees about their progress on jobs	Knowledge of proper feedback Effective feedback skills Helping attitude
	Examine specific job products during production to ensure quality	Knowledge of quality standards Quality assessment skills
listen effectively	Provide feedback to employees about performance	Knowledge of effective listening skills Knowledge of conflict styles Conflict resolution skills Knowledge of proper feedback Effective feedback skills Positive attitude for treating employees with respect
And so forth . . .		

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Next, the consultant met with the supervisors, first as a single group of nine to do an operational analysis and then individually to discuss individual performance. He chose to use a slightly different approach to the operational analysis because he expected that they might have some problems working from the form used with the owner. The following excerpt comes from that interview.

To begin the meeting, the consultant said:

I am here to find out just what your job as supervisor entails. This step is the first in determining what training we can provide to make you more effective in your job. First, we need to know what it is you do on the job. So I am going to let you provide me with a list of the things you do on the job—the tasks. Let me give you an example of what I mean. For the job of a salesperson, I might be told a required task was to “sell printers.” This description is too general to be useful, or you might say you must “introduce yourself to a new client,” which is too specific. What we need is somewhere in between these two extremes, such as “make oral presentation to a small group of people.” Are there any questions? OK, let's begin.

1. Q: Think of a typical Monday. What's the first thing you do when you arrive at work?
2. A: Check the answering machine.
3. Q: That is a little too specific. Why do you check the answering machine?
4. A: I need to return any important calls from suppliers or customers.
5. Q: What do these calls deal with?
6. A: Complaints usually, although some are checking on the status of their job.
7. Q: Anybody else do anything different from that?
8. A: No.
9. Q: What do you do next?
10. A: Examine the jobs that have come in and prioritize them based on their complexity and due date.
11. Q: The task, then, is organizing and prioritizing the new jobs you received. What next?
12. A: Meet with each subordinate, see how they are doing, and distribute the new work.
13. Q: Tell me what “see how they are doing” means.
14. A: I make sure that they are on schedule with their work. I check their progress on the jobs they are working on.
15. Q: OK, so check on progress of subordinates is the task. What next?
16. A: After all the work is distributed, I check to see what orders are due to be completed and sent out today.
17. Q: OK, but I guess that assumes everyone is on schedule. What do you do if someone is behind in their job?
18. A: Depends how far behind the job is. If it is serious, I may simply take the job away and give it to someone I think can do the job faster.
19. A: I do not do that. I find out what the problem is and help the person get back on track.
20. Q: So you spend some time training that person?
21. A: Well, sort of. It is not formal training, but I will see why the person is having problems and give some of my “tricks of the trade” to speed things up.
22. Q: Anybody deal with this issue differently?
23. A: I do not usually have the time to do any training. I will give it to someone who can do it, or in some cases, just do the job myself. Sometimes that is faster. After all, we have all this useless paperwork that we have to do.
24. Q: I want to come back to the paperwork, but first, are you saying that no standard exists for dealing with employees who are having problems with particular jobs?
25. A: Sure there is. The boss expects us to train them, but with the pressure for production, we often do not have time to do that.
26. A: Well, I agree with that. Even though I do stop and spend time helping, I often feel the pressure to rush and probably do not do a good job of it. I do try and tell them what they need to do to improve in the particular area.

Although the format used in the session starts first thing in the morning and continues through a typical day, clues often emerge as to other tasks that are done. The mentioning of “tell them what they need to do to improve” causes the consultant to focus on that task and what other tasks are related to it, because the owner did indicate that providing feedback was an important task.

1. **Q:** OK, let's look at the issue of telling them how to improve. We could think of that as giving feedback to employees. What other tasks require you to discuss things with subordinates?
2. **A:** We are supposed to deal with their concerns.
3. **A:** Yeah, that's right, and also we are supposed to meet one-on-one with them and discuss their performance. Trouble is, these new employees are know-it-alls and not willing to listen.
4. **A:** You're right about that. On more than one occasion, many of us resort to yelling at these guys to get them to respond.
5. **A:** Boy, is that ever true.
6. **Q:** What about the paperwork?
7. **A:** Well, it is stupid. A clerk could do it, but we are expected to do it. If we do not, then billing and other problems come up, so we have to do it or else. ...
A: Yeah, it takes away from us being out here where we are needed.
And so forth. ...
Other questions that might be asked:
What is the next thing you would do in the afternoon?
The next?
What is the last thing you do in the day?
That pretty much describes a typical day (Monday in this case). Is there anything you would do at the

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beginning of the week (Monday) that is not done at other times?

How about at the end of the week? Is there anything you do then that is not done during the rest of the week?

Is there anything that you do only once or twice a week that we missed?

Now think about the beginning of the month. What do you do at the beginning of the month that is not done at other times?

How about the end of the month?

Is there anything that is done only a few times a month that we might have missed?

The beginning of the year?

The end of the year?

Are there any tasks that we may have missed because they occur only once in a while?

You will note that often it is necessary to redefine the task statements for the incumbent. This art comes with practice. The following list contains some of the tasks and relevant KSAs obtained from the TNA.

Tasks	KSAs
Deal with customer complaints	Knowledge of effective listening processes Knowledge of conflict resolution strategies Listening skills Conflict resolution skills
Organize and prioritize jobs	Knowledge of types of jobs received Knowledge of time required for various jobs Organization and planning skills
Check on progress of subordinates' work and provide feedback on performance	Knowledge of proper feedback processes Communication skills
Deal with concerns of employees	Positive attitude toward treating employees with respect Knowledge of effective listening processes Knowledge of communication strategies Positive attitude toward helping employees

Next, for the person analysis, individual meetings with supervisors and one with the owner (supervisor of the supervisors) were conducted. The questions came right from the job analysis and asked about the supervisors' knowledge of the areas identified, the skills needed, and their attitudes toward issues identified as important in their job. The introduction to the interview was as follows:

From the interviews, I have listed a number of knowledge, skills, and attitudes that are necessary to be an effective supervisor here at Fabrics, Inc. I would like to ask you how proficient you believe you are in each of them. By the way, do not feel bad if you have no understanding of many of these concepts; many do not. Remember, the information gathered will be used to determine how to help you be a better supervisor, so candid responses are encouraged. In terms of having knowledge of the following, indicate to me if you have no understanding, a very low level of understanding, some understanding, a fair amount of understanding, or complete understanding.

The results of the TNA identified a number of KSAs (training needs) that were deficient, as well as some nontraining needs.

Addressing Nontraining Needs

The following nontraining issues need to be addressed to help ensure that supervisory training will be transferred to the job:

- Have owner (either with others or on his own) determine the goals and objectives of the company and which aspects of performance should be focused on.
- Set up a formal appraisal system where, in one session, the owner sits down with each supervisor to discuss performance and set objectives. In another session, performance development is discussed.
- Use objectives set for the year and clarify how rewards (bonus, pay raises, and so forth) will be tied to the objectives.
- Set up similar sessions for supervisors and subordinates in terms of developmental performance review (at a minimum). Also, consider incentives based on performance appraisals.
- Hire someone to relieve the supervisors of some of their paperwork so they can spend more time on the floor.
And so forth, ...

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Training Needs

Several training needs were evident from the needs analysis beyond what was indicated by the owner. Specific to those issues, however, supervisors were particularly candid in indicating that they had never been exposed to any type of feedback or communication skills. They had no knowledge or skills in these areas. Attitudes in this area were mixed. Some believed that the best way to provide feedback is to "call it like it is." "Some of these guys are simply not willing to listen, and you need to be tough" was a typical comment from these supervisors. Others believed that treating subordinates the way you would like to be treated goes a long way in gaining their support and willingness to listen.

A partial list of training needs includes lack of knowledge and skill in:

- Effective listening
- Communication
- Conflict resolution
- Effective feedback
- Employee performance measurement
- Employee motivation . . . and so forth

At this point, we will leave "the training program" with the needs identified. The next step is the design phase. We will return to Fabrics, Inc. at the end of **Chapter 5**.

Key Terms

360-degree performance review
Actual criterion
Actual organizational performance (AOP)
Actual performance (AP)
Assessment center
Behavioral test
Bias
Bias in performance ratings
Capital resources
Cognitive test
Competency
Content validity
Criteria
Criterion contamination
Criterion deficiency
Criterion relevancy
Declarative knowledge
Error (measurement)
Expected organizational performance (EOP)
Expected performance (EP)
Group characteristic bias
Halo effect
Human resources
Job aid
Job-duty-task method
Job expectation technique
Knowledge of predictor bias
Operational analysis
Opportunity bias
Organizational analysis
Organizational environment
Organizational performance gap (OPG)
Performance gap (PG)
Person analysis
Proactive TNA
Procedural knowledge
Reactive TNA
Reliability
Self-ratings
Simulations
Split half reliability
Strategic job analysis
Succession planning
Task-oriented job analysis
Test-retest reliability
Training needs analysis (TNA)
Ultimate criterion
Validity
Work sample

Questions for Review

1. What is the purpose of a TNA? Is it always necessary?
2. What is the difference between proactive and reactive TNA? When is proactive better?
3. What are competencies, and why are they popular in training departments? How are competency models related to job analysis?
4. Describe how you would go about analyzing the future training needs of your university.
5. To obtain person analysis data, why not just use the performance appraisal completed by the supervisor? How can you obtain the best information possible if performance appraisal data must be used? How do self-ratings fit into this approach?

Exercises

1. In a small group, analyze the job of "student." What are the duties and tasks required? From these tasks, list the KSAs that students need. Are any in your group deficient in any of these KSAs? Now identify and list the workshops offered to students to help them be successful. Are these relevant to the KSAs you identified? What additional programs would you recommend be offered?
2. Do the same job analysis for students in another field, and compare it with yours. Are the KSAs the same for

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- a student in science and arts? In law or engineering? What, if anything, is different?
3. Talk to someone you know who is currently working and see whether it would be possible to do a TNA on a particular job classification or on that person's job. Even interviewing only a few employees would provide enough information to give you an idea of how to conduct the TNA.

Fabrics, Inc., Questions

1. Compare the information provided in the Fabrics, Inc., case with the sources for locating gaps in performance in Table 4-1 and identify which sources were used. Are there any other sources that would provide useful information?
2. In collecting information, did the training analyst ask the correct people for the relevant information? Explain your answer. Hint: Examine Table 4-2.
3. How would you go about dealing with the nontraining needs? Why is this important?
4. What sources of data were used in the operational analysis? Indicate how closely they correspond to the ideal model presented in the text.
5. What sources of data were used in the person analysis? Indicate how closely they correspond to the ideal model presented in the text.

Web Research

Conduct an Internet search to identify a needs analysis model that is different from the one presented in this chapter. Summarize the two models and describe how they differ. Provide a critical analysis of these differences.

Case Analysis

Fred recently became a manager at a local hardware store that employs six managers and 55 nonmanagement employees. As new, larger chains such as Home Depot come to the area, the owner is concerned about losing many of his customers because he cannot compete on the basis of price. The management team met and discussed its strategic response. The team arrived at a strategy that would focus on high volume items and make personalized service the cornerstone of its effort. Fred's responsibility was to train all nonmanagement employees in good customer relations skills; for that he was given a budget of \$70,000. Over the past six months, Fred has received a number of training brochures from outside organizations.

One of the brochures boasted, "Three-day workshop, \$35,000. We will come in and train all your employees (maximum of 50 per session) so that any customer who comes to your store once will come again."

Another said, "One-day seminar on customer service skills. The best in the country. Only \$8,000 (maximum participants 70)."

A third said, "Customer satisfaction guaranteed on our customer satisfaction training for sales clerks. Three-day workshop, \$25,000. Maximum participants 25 to allow for individual help."

Fred liked the third one because it provided personalized training. He called the company to talk about its offering. The consultant said that by keeping the number small, he would be able to provide actual work simulations for each of the trainees. He also indicated that he would tailor the simulations to reflect the hardware store. Fred noted that they would need two sessions and asked the consultant if he could take a few more per session to accommodate the 55 employees. The consultant agreed. The training went ahead, and the cost was under budget by \$20,000.

Case Questions

For the purpose of these questions, focus only on the training aspect of the case.

1. Do you agree with Fred's decision to conduct the training and use the third vendor? Using concepts from the chapter, explain your answer.
2. What else might Fred do before choosing a training package? Use information provided in Chapters 2, 3, and 4 to describe your approach. Make sure to provide enough detail to demonstrate your understanding of the key issues and approaches to determining how to proceed once a triggering event has occurred.
3. If training went ahead as indicated, how successful do you think it would be? Explain your answer using concepts from this chapter.

Appendix 4.1

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One of the most critical components of training is the development of appropriate tests (criteria) to accurately measure success in training. These criteria can be used for assessing KSAs during the TNA, providing feedback during training, and evaluating the training once it is completed. This section provides both a conceptual framework for understanding criterion measures and a practical guide for developing sound criteria.

Criteria

Criteria are measures of expected performance. The data gathered in the operational analysis describe what the expected performance is for the job. From this, ways to measure both the level of job performance and the employees' KSAs will have to be developed. Development of sound criteria is important, as they will be used not only to measure how employees are doing but also as a measure of training success. So let's examine this issue of criteria development in more detail. Two critical components of good criteria measures are that they should be both reliable and valid.

Reliability

Reliability is the consistency of a measurement. It is often calculated using a correlation coefficient. It can be measured in the following two ways: across similar measures (*split half reliability*) and across time (*test-retest reliability*).

For the *split half* method, let's assume that 100 multiple-choice questions are used to test students' knowledge of this course. To determine the reliability of the test, the instructor splits the test into two sections: even-numbered questions and odd-numbered questions. He considers them as separate tests, even though the 100 questions are given at the same time. Adding up the score of the odd-numbered and even-numbered questions provides two scores for each student. Correlating the two scores, the instructor determines how reliable the test is. A high correlation would suggest that the test is highly reliable.

In the *test-retest* method, the instructor gives the test today and again in three days. He correlates student scores from the two time periods. Again, a high correlation between the two sets of scores would indicate a reliable test.

Highly reliable criteria measures are important. Consider a criterion for a machinist who has completed training. He must produce a shaft exactly four centimeters thick. A test is constructed requiring the trainee to produce a shaft with the correct specifications. To pass the test, the trainee must produce a shaft with a measurement that can be off by no more than 2/1,000ths of a centimeter. The evaluator measures the shaft with a micrometer (a measurement instrument able to detect differences in thousandths of centimeters). She finds it 1/1,000th of a centimeter too large. If she measured it tomorrow, she would find the same results. If another instructor measured it using the same procedure, he would find the same results. This criterion is highly reliable. If a ruler is used instead of a micrometer, the results still might be reliable but less so, because the less accurate ruler makes judgment errors in reading the scale more likely. Developing well-designed instrumentation, therefore, is important to obtaining a reliable measure, whether it is for a machinist or a measure of interpersonal skills.

Although developing a reliable instrument is important, the reliability in the use of the instrument is of equal importance. Both the instrument and the procedure used in applying it affect the reliability of the results. Without training, the evaluator in the example above would not know how much to tighten the micrometer around the shaft before obtaining the measurement. If one evaluator tightened it as much as he could and another tightened it just until she felt the first sign of resistance, the difference in results could be more than the 2/1,000ths of a centimeter tolerance allowed.

Validity

Validity is the degree to which a measurement actually measures what you say it measures. Compared with reliability (the consistency of a measure), validity is more difficult to assess. Consider the question, "Has training resulted in learning?" Learning is a physiological process that takes place in the brain. We cannot assess this process directly, so we test

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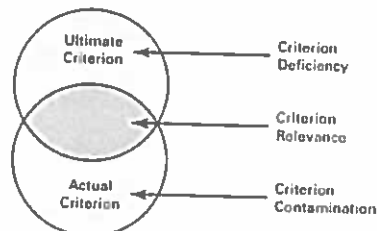


Figure 4-6 Illustration of Criterion Deficiency, Relevancy and Contamination

individuals and, on the basis of their scores, we infer whether learning takes place. It is not a direct measure of the learning process but an inference based on behavior.

To better understand the problems associated with validity, let's look at what we call the **ultimate criterion**. The ultimate criterion is what we would like to be able to measure if it were possible to do so. It would include the exact indicators of the object being measured. However, we are never able to measure the ultimate criterion, because it is simply a theoretical construct. We must settle for what we are able to measure, which is the **actual criterion**. Examining the relationship between the ultimate criterion and the actual criterion provides us with insight into the problems associated with criteria development. The actual criterion, what we settle for, can be thought of in terms of its relevance, deficiency, and contamination in relation to the ultimate criterion (see Figure 4-6).

Criterion Relevancy

Criterion relevancy is the portion of the actual criterion that overlaps the ultimate criterion (see Figure 4-6) and represents the validity of the actual criterion. However, given that we can never measure the ultimate criterion, an empirical measure of this validity (a correlation between the ultimate criterion and actual criterion) is not possible. This problem illustrates the need for logical and rational analysis in developing the actual criterion to obtain the best approximation of the ultimate criterion.

Let's look at an example in which training is designed to improve interpersonal relationships. Raters evaluate the learning by rating a trainee's behaviors in a scripted role-play. The degrees to which the raters are trained, to which the scales to be used in rating are well developed, and to which examples of acceptable and less acceptable behavior are clear to the raters are all factors that contribute to the validity of the criterion (overlap of actual with ultimate). Because these will never match the ultimate criterion perfectly, deficiencies and contamination will always be factors. The more rigorous the development of criterion measures and processes, however, the more the actual criterion will approach the ultimate criterion.

Criterion Deficiency

Criterion deficiency is the part of the ultimate criterion that we miss when we use the actual criterion or the degree to which we are not measuring important aspects of performance. The factors that make up a trainee's ability to produce parts with a tolerance of a few thousandths of a centimeter are more complex than simply being able to do it under ideal testing conditions. Factors such as noise in the plant, climate in the plant, different types of parts that need to be machined, and supervisor-subordinate relationships contribute to making a machinist successful. Our measure of success (producing one part in a training room) will obviously be deficient when compared with an ultimate measure of a successful machinist, which takes into consideration all the above factors (the ultimate criterion).

Criterion Contamination

Just as any measure will miss some important aspects of true success (criterion deficiency), so too will it contain some part that measures aspects not related to the true measure of success (criterion contamination). This part of the actual criterion does not overlap with the ultimate criterion.³

The two main categories of contamination are error and bias. **Error (measurement)** is random variation. It is, by definition, not correlated with anything, and, therefore, not as great a concern as is bias. Error lowers validity but does not cause misrepresentation of the data unless the error is too large. Then, of course, error can be a problem. Poorly trained evaluators, poorly developed instruments, or other factors could also cause high error content.

When the contamination is bias rather than error, it means you are measuring something other than what you want to measure. A large amount of contamination will lead to erroneous conclusions about the object you are measuring. Four sources of such bias are opportunity bias, group characteristic bias, bias in ratings, and knowledge of predictor bias.⁴

When certain individuals have some advantage that provides them with a higher level of performance, irrespective of their own skill level, **opportunity bias** occurs. Suppose, for example, you wanted to know if knowledge gained during training predicted performance on the job. To do this, you would correlate the

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scores on the training exam with performance one year later. If the correlation is positive and strong, this suggests those scoring highest on the training test also produced the most product and best quality (i.e., a high correlation between success in training and overall performance after training). However, those who scored the highest in training received the newest machines to work on as a reward. The relationship between the two scores was contaminated by the fact that the better trainees received the better machines. These machines might have provided the opportunity for success.

If something about the group creates higher (or lower) performance, irrespective of an individual's capability, that is called **group characteristic bias**. For example, trainees who did well in training are placed with Supervisor A, who is progressive and participative in her approach. Those who did less well in training are placed with a more authoritarian supervisor, Supervisor B, who will "keep an eye on them." Once again, those who did better in training might produce more and better-quality products as a function of the climate created by Supervisor A, not the training they received.

Bias in performance ratings

is another possible contaminant. Bias in performance ratings is that portion of the actual criterion which is not correlated with the ultimate criterion but correlated with variables used by raters in their subjective judgments. Supervisors often use subjective ratings in evaluations. These ratings can be tainted because even in areas where objective data are available, it might not reflect the actual skill level of the worker. Some workers have better territories (sales), better equipment (machinist), or a better (clean, well-lit) environment. In many cases, the supervisor does not take these differences into account when rating subordinates. One of the most frequent biases in performance ratings is the **halo effect**. This is a powerful force in rating subordinates. It occurs when a supervisor rates a subordinate on all dimensions of performance on the basis of knowledge of only one dimension. For example, Susan is well organized, so she is rated as a great performer. Supervisors need to be trained to avoid these biases.

The final possible contaminant is **knowledge of predictor bias**. The criterion for success in training could be thought of as a predictor of later performance on the job; successful training should contribute to successful performance. But knowing each employee's success level in training could influence the supervisor's ratings at some time in the future.

Relationship between Reliability and Validity

Reliability is the consistency of a measure, and validity is the degree to which you are measuring what you want to measure. As an example, imagine that a rifle manufacturer has two new rifles he wishes to test for their ability to hit the bull's-eye. He places the first rifle in a vise-like mechanism to prevent deviation, which occurs if a person were doing the shooting. For the purpose of this discussion, we will change the terminology for validity slightly. We will say that validity is "doing what you want it to do" rather than "measuring what you want to measure." Conceptually, these notions are the same. In the vise, the first rifle is aimed at a target 50 yards away, and five shots are fired. Each shot hits the target (see Figure 4-7 A). Is the rifle (instrument) consistent (reliable)? As you can see, the five bullets struck the target but they are all over the place. The rifle is not reliable. Nor is it valid (doing what you want it to do: hit the bull's-eye). There is no point trying to make the rifle valid (doing what you want it to do) because it has no reliability; you need reliability before you can have validity. The next rifle is placed in the vise. This time the five shots are all in the upper left-hand corner of the target (Figure 4-7 B). Is the rifle reliable? Yes, because it consistently hit in the same place for all five shots. Is it valid? No, it did not hit the bull's-eye. We now adjust the sight and fire; all five hit the bull's-eye (Figure 4-7 C). Is this rifle reliable? Yes, the

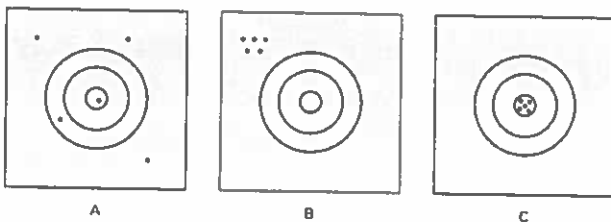


Figure 4-7 A Comparison of Reliability and Validity

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bullets were all in relatively the same place (consistent). Is it valid? Yes, all five hit the bull's-eye as well.

From this example, it should be clear that you can have a reliable test that is not valid, but you cannot have a valid test that is not reliable (Figure 4-7). You need consistency of a measure before you even consider expecting all the bullets to hit the bull's-eye. Reliability, therefore, is a primary concern, but only because you need it to have validity.

Development of Criteria

It might seem that developing sound criteria is impossible. Not so. As we discussed previously, the operational analysis identifies the level of acceptable performance and the KSAs required to meet this performance level. From this analysis, criteria can be developed. Once criteria are established, the next step is to carefully develop instruments to measure the criteria. The instruments should leave as little as possible to the judgment of the rater.

Consider the job of internal auditor. One of the tasks identified from the operational analysis is "knowledge of which reference books to use for auditing problems." A part of the knowledge required, then, is to know what is contained in the various reference manuals. Training would require the trainee to learn what was contained in the various reference books. A criterion for success would be demonstrating this knowledge.

If you want to develop a reliable and valid measure of the criterion "understanding what is contained in the reference manuals," an excellent method would be a multiple-choice test of the material. The advantage of a well-designed multiple-choice test is that minimal judgment is necessary. So no matter who scores the test, the outcome will be the same, making it highly reliable. Taking care to choose a cross section of questions from all the material will provide a level of validity. Given that well-designed multiple-choice tests can accurately measure any type of knowledge, we strongly suggest their use when possible.

Developing sound criteria for skills is more difficult and may not be as reliable. However, instruments to measure skills, if carefully developed, can still meet reliability requirements. Some examples of such measuring instruments are presented in the discussion of evaluation in Chapter 9, under "Fabrics, Inc."

In the internal auditor example provided earlier, an expected behavior might be "calm an irate department head." The skill required to accomplish this behavior could be "active listening." A measure of the criterion would be how a trainee behaves in a role-play situation in which the role-player becomes angry at something the auditor says.

In the case of measuring the criterion "calming an irate department head," it is critical to develop clear rules and examples of what is and is not acceptable. Also, it is important to train raters in the use of the rules and to provide examples. The more familiar the raters are with good, average, and poor responses, the more reliable the measure can be.

Validity in such instances is called content validity, when an expert examines the criteria on the basis of her knowledge of the TNA. It is important, therefore, to conduct a good TNA, for everything that follows from it (both training content and evaluation instruments) is based on that analysis.

The time and effort spent developing a sound criterion are critical to the training process. Once developed, the criterion is used to determine the following:

- Expected level of performance (operational analysis)
- Likelihood that the incumbent can reach it (person analysis)
- Training needs for those who cannot reach it (a training objective)
- Measures of training effectiveness (training success).