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As noted earlier, improvement requires change, but not every change is an improvement. So, where do changes that result in improvement come from? Sometimes people are just lucky. For instance, a change in the business environment may open up new opportunities for a company. Unfortunately, organizations cannot count on luck. So, opportunities for change need to be pursued in a purposeful way.

Fred had managed the distribution department for eight months. When he first started the job, he sat down with some of the people in the department to get an understanding of how things were going. What he heard gave him a headache! Orders were not being filled promptly, and many were returned because of mistakes. Fred hoped that things would get better, but eight months later, similar things were still happening.

Fred needs to begin to pursue purposeful change. When people make changes, they are usually trying to improve the quality of their work or lives. For a change to have this kind of impact, it will involve altering an existing activity or product, or developing something new. In business terms, this is called the design or redesign of a process, product, or service.

All change should be thought of from the standpoint of those who will benefit from the change. When people make changes in their lives, the people who benefit are themselves, their families, and their friends. When changes are made in an organization, the focus should be on benefits to the customer. When answering the fundamental questions, the customer's voice should stand out. Fred heard the customer's voice loud and clear, through complaints about the time it took to ship orders and the number of errors that were made. Fred will learn that complaints are perhaps the least desirable way to hear the customer's voice.
The Model for Improvement introduced in Chapter One and further explored in Chapter Four provides the framework for making effective change. The three fundamental questions and the PDSA cycle all play a role in making a change that results in improvement. Sometimes, when confronted with the third question, *What changes can we make that will result in improvement?* the answer is obvious. The knowledge to support a specific change has existed for some time, but the conditions, resources, or inclination needed to make the change happen have not existed. Many times, however, a change that will result in improvement is not obvious. In such cases, people have a tendency to resort to some common and often ineffective ways of developing change.

**Some Problems in Developing Changes**

Once Fred decided that something had to be done, he set up a meeting with Susan, the vice president. Fred requested that an additional person be hired to work in the distribution department, or at the very least, that the current people be allowed to work overtime. Susan was somewhat skeptical about this approach, since an additional person had been hired a little more than a year ago. She asked Fred about some of the other things he had tried in order to improve the timeliness of shipments. Fred said that he had tried weekly pep talks to encourage people to work faster. He had even gone as far as trying to enforce daily work quotas. Nothing was working. Susan would not agree to hiring another person. She suggested that Fred try having the people inspect one another's work to reduce the number of errors made.

Both Fred and Susan employed some common, ineffective approaches to improvement. They resorted to doing more of the same—more people, more money, more time, more exhortations. Susan also suggested adding inspection. Although such changes are commonly used, none of them will alter the basic way work is accomplished in the distribution department. They may result in some improvement in the short term, but they will also probably add expense and complexity to the system.

There are some situations in which a desired improvement may be achieved by applying more of the same (such as adding heat or warm clothing to combat cold). In many other situations, however, this type of solution does not achieve the improvement desired because it leaves the structure of the system unchanged. Such a solution can often contribute to the problem, or actually become the problem. Some examples are:

- Trouble with meeting customer requirements: add more resources (more money, more time, more people).
• Trouble with a product: introduce or add more inspection.
• Trouble with variation in a process: make more adjustments.
• Trouble with adherence to procedures: add more procedures or define them more rigorously.
• Trouble with discipline: add more restrictions.

It is also common for people to look for perfection when they are developing a change, a tendency known as the utopia syndrome. This syndrome causes them to suffer a sort of paralysis of action. Part of the motivation of looking for the perfect change is fear of failure. To make a change is to take a risk. The change might not result in improvement; in fact, a change might actually make things worse. As long as people are busy working on perfection, they will not have time for testing new ideas. The fact that doing nothing may be a bigger risk is little consolation. To support the development and testing of change, people must be willing to embrace the unexpected (things not working out as planned) as an opportunity for learning. (Many of the ideas and techniques described in this chapter and in Chapter Six are meant to provide the reader with an approach that minimizes the risk of making a change.)

First- and Second-Order Change

Developing a change that is a significant improvement from the viewpoint of the customer is not always easy. It requires that a fundamental change be made to the system. The change need not be expensive or time consuming; it just needs to involve design or redesign of the process, product, or service.

In developing changes, it is useful to distinguish between changes that are needed to keep the organization running day-to-day (first-order changes) and changes that are needed to create a new system (second-order changes).

First-Order Changes

First-order changes are required to maintain the system at its current level of performance. The following are some aspects of first-order change:

• They are often made routinely, to solve problems or react to a special circumstance.
• They often result in putting the system back to where it was some time before.
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Sometimes they take the form of a trade-off among competing interests or characteristics (such as increasing quality but also increasing costs, reducing errors but also reducing volume).

Their impact is usually felt immediately or in the near future.

When dealing with problems, there is often a need to make first-order change. A customer may not receive a shipment when they expected it because a truck broke down; a physician may be called away on an emergency, affecting the waiting time of scheduled patients; or a bad raw material may result in a faulty product. In each of these cases, there is a need to make changes to remove the immediate problem and bring the performance of the system back to where it had been. Special circumstances could also affect costs. Materials may run out, resulting in a company having to pay retail prices; waste could be increased by a faulty machine; or a pipe could break, causing excessively high water bills.

When Fred looked more closely at the work being done in the distribution department, he noticed that the postal meter broke down quite often. This added to the delays in fulfilling orders. Fred brought this problem to the attention of the company that provided the meter. They promised to get a repairman there quicker the next time the meter was out of order.

Second-Order Changes

Making first-order changes is important. If the postage meter were not repaired quickly when it broke down, customers would experience long delays. First-order changes should not, however, be confused with second-order changes, which prevent problems from occurring. After a first-order change has been made, customers will perceive that an immediate problem has been solved. After a second-order change has been made, customers should perceive that an improvement has been made.

Second-order changes are required to improve the system beyond historical levels. The following are some aspects of second-order change:

- They result from design or redesign of some aspect of the system.
- They are necessary for the improvement of a system that is not plagued by problems.
- They fundamentally alter how the system works and what people do.
- They often result in improvement of several measures simultaneously (such as quality and cost, or time-to-ship and errors).
- Their impact is felt far into the future.

Fred was happy that the supplier of the postal meter was being more responsive when the machine broke down. He was not happy that he did not see a significant impact on service to customers. So, he decided to have discussions about improvement with the people who worked in the distribution department. After a few meetings, they agreed that there were many times during the year when their workload surged because of special offerings. If they could only find out about these specials earlier they could begin to prepare them for shipment during their slow work periods. The people were sure that this would reduce the time to fulfill requests, and that it would also reduce the number of errors. They used a couple of PDSA Cycles to test this change. The result was a reduction in the average time to fulfill requests and in the number of orders that were returned because of errors. What made the group even happier was that the improvement was often mentioned by customers on the company's monthly survey. The people in the department were so encouraged that they began to think about other changes they could make to improve performance.

A second-order change can be made by redesigning part of the current system or by designing an entirely new one. When redesigning a system, it is important to consider whether the system is even needed. Eliminating part or all of a system is one possible second-order change. The important notion is not the size of the change but the impact the change has. Big improvements can often be realized by making small changes directed at the right places in the system.

Fred's group decided to focus on the system of order fulfillment for large orders (see Figure 5.1). Two departments played a major role in the system. The customer service department took the orders and printed the picking tickets. Fred's distribution department then pulled the items, packaged them, and loaded them onto a truck.

After the picking tickets were printed in customer service, someone walked the tickets down to distribution twice a day. This resulted in alternating periods of light and heavy workloads. If the heavy period was in the afternoon, shipments often were not completed that day. Operation of this system resulted in only about 40 percent of orders being shipped on the same day they were received. To improve upon this performance, Fred's group worked with customer service to make two small but significant changes. The first change was to move the customer service printer into the distribution department. The
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Fred noticed that once in a while the picking tickets would pile up in the printer. When he asked his group what was going on, they said that sometimes they forgot that the picking tickets were no longer being delivered to them by customer service. Fred wrote himself a reminder to get the picking tickets from the printer. He could not be there all the time, however. He realized that he needed to get his group together again to develop a way to assure that the picking tickets would be picked up every hour.

Developing Second-Order Change

Some approaches to developing second-order changes are:

1. Critical thinking about the current system
2. Using technology
3. Creative thinking
4. Using change concepts

**Critical Thinking About the Current System**

Sometimes it just takes a little time to develop good ideas for change, by reflecting on the system (perhaps with the use of a flowchart) and using already-existing knowledge of the subject matter. Talking about or documenting the way a process is currently performed or how a product works or is used might be sufficient to identify changes. This is the approach Fred took with his group in the distribution department. Reflection on what is wrong with a system can be enhanced with knowledge of some principles of good system design (which will be introduced in the discussion on change concepts later in this chapter).

Figure 5.2 contains an example of a flowchart that was created by a group working in a blood plasma donation center. Their aim was to improve the process by which new donors were selected. Once the group had spent some time reviewing the flowchart, it became obvious to them that some things were wrong with the current process. The fact that donors could be rejected at three different steps in the process added complexity. Some simple changes were made that had the physician and phlebotomist working more as a team, which resulted in more plasma being collected and increased customer satisfaction. The changes made are shown in the flowchart contained in Figure 5.3. (This example is discussed further in Chapter Eight.)

To assist in critical thinking, data can be collected and analyzed to build knowledge about the current system. The collection and analysis of data contributes significantly to identifying problems and their causes so that changes can be made. Figure 5.2 shows the original process of selecting new plasma donors.

**Figure 5.2. Flowchart of Original Process of Selecting New Plasma Donors.**
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Developing a change, by reflecting on already-existing ways the way an activity might be sufficient for a group in the future, can improve the design (which will be discussed in Chapter 4).

Changes are often identified by a group of users who want to improve the current system and spent some time at one place. These changes were made at three different places, which resulted in the current system. The changes to these places are described in the following examples.

An example is described to build the concept of data collection in a system that changes can be developed. These changes can then be tested in later cycles. An example of collecting data in a rapid rail transportation system to help develop a change was included in Chapter Four. Another example follows.

The nurses at a Midwest hospital felt that certain blood serum measures made by the hospital's laboratory were unreliable. They decided to run a cycle to better understand the nature of the variation in the blood measurements. They sent the lab a sample of blood from one large stored bottle once every shift for two weeks. The data obtained was plotted on a run chart (see Figure 5.4). The nurses learned from the plot that the B shift consistently produced higher results than the A or C shifts. Based on this knowledge they determined that any change made to reduce the variation in blood testing should be related to the differences in shifts.
More sophisticated approaches to data analysis (such as planned experimentation, regression analysis, time series analysis, or simulations) are available. When appropriate, these methods can be used to assist in developing changes.

**Using Technology**

For the purposes of this discussion, technology will be defined as the practical application of science, including equipment, materials, information systems, and methods. Technology can be used to generate second order-change. For instance, Fred's group in distribution might try a change that uses automation to pick and package orders. If approached correctly, new technologies offer organizations the opportunity for making big improvements by just applying what others have developed. However, large amounts of money and time are often necessary to make a technology-related change happen, especially in a capital-intensive industry such as manufacturing. In some situations, the change may not even result in improvement.

A transportation company introduced a computerized reservation and routing system. The system left thousands of potential passengers unable to get through on the phone and thousands of actual passengers stranded in terminals. Ridership and the company's stock price plummeted.

This company is not alone when it comes to the introduction of new technology. Between 1985 and 1995, companies invested more than a trillion dollars in new information systems alone. These systems have created opportunities to solve quality problems, reduce costs, and develop new products and services. Some would question, however, whether they have resulted in all of the improvements desired. By considering methods for improvement when acquiring and using new technology, the likelihood increases that the technology will result in an improvement.

To take advantage of new technology, processes for recognizing relevant technological breakthroughs should be in place within the organization, along with processes for bringing beneficial technology into the organization. In some situations, an organization might also consider getting involved during the early stages of the development of the new technology. This might be done by establishing partnerships with other organizations or by allowing the developers to test the technology in one's own organization.

The identification of new technology will begin to answer the third fundamental question of the Model for Improvement (*What changes can we make that will result in improvement?*) The other two questions of the model (*What are we...
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Trying to accomplish? and How will we know that a change is an improvement? should also be answered. This will mitigate the acquisition of technology for technology's sake.

Organizations must determine ways to test the new technology on a small scale, which should help reduce the risk involved in bringing it into the organization. Renting or leasing new equipment, having a supplier provide a few lots of a new material, and using new medicines on laboratory animals rather than on people are examples of ways to test new technology.

Just as (or possibly even more than) any other change, the use of new technology will face resistance and other problems. Some people will find it difficult to change to using the new technology. When computers are introduced, some people feel more comfortable using the more familiar typewriters and file cabinets. Often, the appropriate training is not provided. Sometimes when it is provided, people find ways to avoid it. To lessen these problems, management must have a plan to help people make the transition to the use of the new technology. The guidelines for implementing a change discussed in Chapter Seven should prove useful when integrating technology-related changes into a system.

Following are some cautions for making changes that include technology:

1. Do not automate a bad system.

A professional association processed more than two hundred requests for material's each week. Most of the requests were initiated by a form that appeared monthly in the association's journal. In an attempt to reduce the long delays in responding to those requests, a scanner was purchased that allowed the form to be read directly into the association's computer system. Unfortunately, this did not speed up the process very much. The same information was still missing from or incorrect on the form.

It appears that the association is attempting to automate a bad system. This just allows errors to be made faster. In this case, the use of technology was a high-cost change that did not result in improvement. Improvement could have been made through simple redesign of the system. Changes such as mistake proofing and simplification of the form, minimization of the number of hand-offs, and standardization of the system should be considered. Cycles might be run to redesign the system first before a change involving automation is developed and tested.

2. Try to reserve technological solutions for improving stable systems rather than fixing special causes.
The variability of the semifinished product coming from a particular operation in a large manufacturing facility was so great that the product was difficult to process at further operations. This resulted in large scrap and rework costs. To reduce the variability, the plant manager proposed to the division vice president that they purchase a new piece of equipment. Although the new equipment was expensive and more costly to maintain, the plant manager felt that the savings in scrap, rework, and other costs would offset most of this extra cost.

Before a change involving technology is developed, it should be understood whether special causes affect the variability in the system. If the above system was studied by the people in the plant, they might discover that special circumstances were the source of much of the variation. Special circumstances might include changes in lots of raw material, substitute operators, or changes in operating conditions. Although the new equipment could mitigate the effect of these special causes, a more cost-effective change might be possible. Once the special causes have been identified and removed, if further reduction in variation is needed, then a more fundamental change will be required. Only then should the use of new technology be considered.

3. Direct changes that involve technology at a bottleneck.

A hospital invested in a new computer system to speed up the paperwork required for admissions. New patients could now be processed in half the time. They were not in their rooms any faster, however, because they still had to wait until a room was available.

A bottleneck within an organization is any juncture where the demand for a resource is greater than its availability. Since the throughput of the system is dictated by the capacity at the bottleneck, changes should be directed at increasing the flow through that resource. Using technology to increase capacity in areas that are not bottlenecks will not result in increasing the throughput of the system. It will just result in greater waiting times at the bottleneck. The hospital used new technology to increase patient flow through admissions. This did not decrease the total time for patients to get to their rooms because the discharging of patients was the bottleneck in the system.

4. A technology that is unreliable is worse than none at all.
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Once a change involving technology is implemented, people rely on the performance of that new technology. The new technology should therefore be thoroughly tested so there is no doubt about its reliability. In John’s case, the improvement realized by the installation of the garage door opener was lost by his bad experience.

Creative Thinking

In its simplest form, creativity is the inventing of a new idea. Where does the new idea come from? How does one go about getting some more creative ideas? The way the human mind works is very well-suited for producing new ideas—for being creative. This means that creativity is not something that a few gifted people possess, but rather a capacity that everyone possesses. How can people begin to unleash that capacity?

The nature of the mind that makes it a bountiful source of creativity is also the force that hinders creativity. A way to think of the mind is as a self-organizing information system. As perceptions and experiences occur, the mind attempts to find meaning and order. This organizing process uses existing thought patterns to judge the meaning of the new experiences. Using existing thought patterns severely restricts the options for change that people consider. It is one of the primary reasons that individuals or groups who are not skilled in improvement usually produce ideas for improvement that are “more of the same.”

The normal thought patterns that occur in a particular situation have a logic that has been sharpened over time (Figure 5.5). Since a new idea does not yet have an acquired pattern of logic to support it, it can easily be defeated by the more well-developed logic of the existing thought patterns. Thus, a promising new idea can be squelched before it has had a chance to be refined into a change that would result in improvement.

One can easily imagine the logical objections that arose from others at the distribution department’s meeting when someone first suggested preparing shipments in advance. If Fred as the supervisor had not supported the idea, would these objections have been overridden? An important breakthrough in creativity is often produced by recognizing and utilizing different modes of thinking. Recognizing the different modes is especially helpful in group or team settings.
The three modes of thinking that are usually present when changes are being developed are:

- **Creative thinking**, which results in new ideas and possibilities
- **Logical positive thinking**, which is concerned with how to make a new idea work
- **Logical negative (critical) thinking**, which is focused on finding faulty logic in the new idea

All three modes are important and play a role in developing changes that result in improvement. Without creative thinking, some incremental improvement may result, but often there is only “more of the same.” Without logical positive thinking, good concepts for change will not result in practical, workable changes to the system. Critical thinking is needed to surface problems. As discussed earlier, critical thinking is useful when reviewing the current system. It is also particularly useful during the design of a test for a change. What could be the negative effects of the change? How can the change be tested on conditions that would give these potential negative effects a chance to occur? Logical positive thinking will help to develop ways to overcome these difficulties.

These three modes of thinking must be recognized and managed by teams that are developing changes. It is usually better for a group to engage in one type of thinking at a time. When new ideas for change are being developed, creative and logical positive thinking should be used. This allows logical thinking to enhance creative thinking rather than stifle it.
How can these three modes of thinking be used to develop creative, second-order changes? Methods for improving creative thinking have their foundation in provoking new thought patterns that lead to new ideas for change. (Figure 5.6 illustrates this concept.) Without new thought patterns, a very limited set of potential changes will be produced. Provoking new thought patterns opens up a limitless variety of changes that can result in dramatic improvement. Following are some general methods for provoking new thought patterns:

1. **Take time.** This is the simplest method. Spend perhaps even just five or ten minutes to expressly do some creative thinking.

2. **Be in the right place at the right time.** A story claims that Isaac Newton was provoked into thinking about gravity by an apple falling on his head as he sat under a tree. Spending time observing customers or taking the role of a customer can allow a person to be in the right place when serendipitous events occur that provoke new ideas.

3. **Challenge the boundaries within which the change can be developed.** People are often limited in developing changes by implicit or explicit boundaries. To challenge these boundaries, begin by listing them. Then eliminate or expand the boundaries. One of the boundaries listed by a group working on improving service in an office cafeteria was that the food was always paid for after it was selected. When the team challenged this boundary, the use of prepaid meal tickets or a set-price buffet were suggested as possible changes.

4. **Attack the solution.** Many times the changes that are suggested are "more of the same" and are a result of current thought patterns. Make a list of the suggested changes and identify what they have in common. As in challenging the boundaries, attack the common themes as hindrances to new ideas. Look for a change that does not possess this commonality. A group working on improving...
efficiencies in their order fulfillment process examined previous changes that had been made. Although some of the changes were successful, all of them were focused on reducing paperwork and handoffs within the organization. A review of these solutions resulted in someone suggesting that customers enter their orders directly into a computer in the distribution area.

5. Use "unrealistic" goals. When the current way things are done is clearly inadequate to meet the goal, ask the question, What would it take to ______? (Fill in the blank with a seemingly unrealistic goal). This will help people to abandon the current way of thinking.

6. Focus on the need. For any particular product or service, articulate what the need is that the product or service matches, and then similar to attacking the solution, discard the current products and services as options. There will be many ways to match the need with new products and services. For example, a landscaping company provided the service of mowing lawns. After they articulated that keeping the grass short and neat was the need for this service, they began to experiment with regulators that slowed the growth of the grass. This almost eliminated the service of mowing.

When new thought patterns are provoked, new ideas for change should result. These ideas can often be brought to life through some form of expression, such as giving an example, drawing a picture, storytelling, or acting them out. Ideas are slippery things and the skill of representation tends to stabilize them, allowing them to be studied and improved upon. Representation also provides a way to share the idea with others.

After Tony drew a picture of the new handles he had been working on, everyone was able to see why it would help with lifting the large pots. Mary added some detail to the picture and they took it down to engineering to see if they could install the handles on one pot.

Using Change Concepts

If a concept is a general notion that is carried out with a more specific idea, what is meant by "change concept"? A change concept is a general notion or approach that has been found to be useful in developing specific ideas for change that result in improvement. When Fred and the group in the distribution department began to consider changes that would improve service, they took time to think critically about how work was being accomplished. This did result in some improvements. Suppose, however, that to provoke new ideas Fred was able to apply already existing concepts for change to his situation. He would have been able to start with a concept such as "smooth the work flow." Then, to develop a
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Fred and his group in the distribution department were having difficulty developing additional ideas for change to further improve the flow of work. A friend who was familiar with Fred’s dilemma passed on to him a book. In the appendix, Fred found concepts that could be used to develop ideas for change. In fact, there was a group of concepts that dealt directly with improving work flow. Fred was very excited about sharing these concepts with his group. He felt the concepts would help to generate some specific ideas for change.

At the next meeting, Fred explained to the group members what he was going to do and asked them to think positively while changes were being suggested. He started by presenting the change concept “minimize handoffs.” Immediately Mike said that they did have a tendency to hand off a particular job, from picking to packaging to posting. There would be fewer holdups if one person could both pick and package the order. Others nodded in agreement and offered some other suggestions. Fred was starting to feel good about this approach. He tried another concept: “smooth the work flow.” Karen said that they had smoothed the flow by starting to prepare orders earlier. She wondered why they had not been given this concept before they had spent so much time trying to come up with that idea.

Next, Fred tried “do tasks in parallel.” John jumped up and almost screamed, “Let’s get the paperwork going at the same time we are preparing the order.” Everyone laughed because John was usually not that animated, but they all agreed with his idea. Fred was very happy about how the meeting was progressing. They had begun to develop a number of good ideas for changes, and he still had more change concepts left. The possibilities for improvement now seemed almost endless.

Fred employed a good approach for using the change concepts. He first picked a general grouping, “improve work flow,” that characterized the improvements he was trying to make. Then he used some of the change concepts from that grouping to provoke specific ideas for change. Fred’s approach is not the only
way that the change concepts can be used, however. A specific idea for a change might be generated first (such as the idea of having one person both pick and package the order), then people could be asked what the general notion is that is being applied to generate that idea, which should lead to the change concept "minimize handoffs." New ideas can then be generated from that change concept (for example, that one person could complete all the steps in distribution to fill an order, or that customers could input their orders directly into a computer system). Other change concepts in the general grouping "improve work flow" might be explored to generate other ideas for changes.

A change concept is not specific enough to use directly. Concepts such as "smooth the work flow" and "minimize handoffs" must be applied to specific situations and then turned into ideas for change. The two ways suggested here for using the change concepts are similar; they are based on the skill of going back and forth between the general (change concepts) and the specific (ideas). The examples provided in the appendix demonstrate the use of this skill. It is an important one to practice when using the change concepts. Some others ways of using them are as follows:

- Select a change concept at random and see what ideas are provoked.
- Study the appendix to learn all the different change concepts and some ideas for their use. Rely on this knowledge when faced with a particular situation.
- Copy the specific ideas in the examples included for each change concept in the appendix if they apply directly to your situation.

Chapters Ten, Eleven, and Twelve include further discussion on the use of change concepts.

Change concepts can be used to stimulate both critical and creative thinking. The change concepts in categories such as "improve work flow," "focus on variation," and "mistake proofing" contain principles of good system design. If you are reflecting on what is wrong with your current system, having in mind some of the change concepts should increase the quality and quantity of the changes you develop. Creative thinking can be stimulated if certain change concepts are selected (perhaps even at random) and used as provocations.

Many of the change concepts in the appendix might be familiar to you already. There might also be other concepts that you would add. The change concepts listed are not meant to be original nor complete. The important thing is that the list can serve as an easy reference and that other concepts can be added to it. The
the rate of improvement will accelerate as people not only use the change concepts but also develop and document new ones. Some of the new concepts may prove more useful in a particular field, such as in health care or education. One way to discover change concepts is to study the improvements that have been made in your organization and ask:

1. What was the specific change that was made?
2. What was the idea used for the change?
3. Where (who) did the idea come from?
4. Which of the change concepts could generate that idea?
5. Can the idea be generalized for other situations?
6. Would a new concept be useful for describing this idea for change?

Fred kept a list of the ideas for change that were developed using the change concepts. The list was very impressive. Although the group believed that all the changes had potential, they also realized that the changes needed to be tested to determine if they actually would result in improvement. So, they prioritized the different changes, considering such things as the predicted impact, the cost, and the ease of testing and implementation. The group was excited, but Fred was worried. He had never thought about testing a change before. When he referred to the book The Improvement Guide, there it was: Chapter Six, "Testing a Change." He began to read it.

## Conclusion

What change can we make that will lead to improvement? The first step in answering this question is to develop an idea for a possible change. The idea can come from critical thinking about the current system, from technology, from creative thinking, or from using the change concepts in the resource guide at the end of this book. The next step is to test the idea.