CHAPTER NINE

IF YOU CAN’T CHOOSE, YOU LOSE

Designing the Solution

During World War I, German U-boats were a huge threat to the British and Americans. Somebody asked the American folk philosopher Will Rogers what should be done. He thought about it a moment and suggested that the military should boil the ocean.

The questioner was flabbergasted. “Boil the ocean?”

“Yes,” said Rogers. “I think if you heated up the Atlantic Ocean, the submarines would rise to the surface and you could capture them.” (In another version of this story, he says, “All the water would evaporate, and you could see the submarines on the bottom.”)

“But how would you boil the ocean?” the person asked.

Rogers answered, “I’m just the idea man here. I’ve given you a solution. You go figure out the details.”

Rogers’s idea is clearly outlandish, but another example shows that sometimes the apparently ridiculous leads to a creative solution.\(^1\)

In the Cascade Mountains, snow is so heavy in the winter that it often causes telephone lines to snap. The problem is exacerbated because the snow also prevents repair crews from driving to the locations of the breaks. In a session to discuss how to reduce the incidence of line repairs, participants came up with what seemed on the face of it to be a nutty idea: attaching heating pads to the bottoms of airplanes and then flying very close to the wires to melt the snow before it got too heavy. This led to the very practical idea that the vibration from helicopter
blades would shake the lines, causing the snow to fall off. Implementation saved $8 million per year.

The steps you follow to design an appropriate solution are based on the premise that your first idea is not necessarily your best. Many people have the mistaken notion that they should go with their initial hunches. The reality is that the first idea to solve a problem has nothing more going for it than a first draft of anything else. Taking the time to consider other options will always lead to the best solution. Thinking of alternatives once there appears to be an answer may seem like a waste of time. And all the work that has been done to reach conclusions often makes the first answer seem so blindingly obvious that to push further would be pointless. Gap analysis provides a case in point.

Gap analysis is an approach that has gained a great deal of support in the past decade as a technique to solve problems and improve organizational performance. In gap analysis, as in all other good problem solving, you begin by setting the objective. You then collect data in an effort to understand the current situation. You follow this with the creation of a vision of the future state. Finally, you figure out how to fill the gap.

Gap analysis is logical in theory, but it has several potential pitfalls that make it challenging to execute. First, individuals often get sidetracked. Many organizations seemingly take forever to agree on the current situation, not because individuals lack an understanding of the organization but because their personal understanding is not necessarily consistent with others’ understandings. Often the better part of the project is devoted to agreeing on the current state, leaving very little time for moving forward or making improvements.

Second, the planned state is often decided on without the benefit of a logic diagram: an option is put forward, and people assume it is right for them. Most people do not bother to test whether it is an appropriate choice. They move directly to the next step of determining how to get there. If they tested several options first, they would be much more likely to find the one that best fits the organization’s objectives and capabilities.

Developing Plausible Alternatives

*Nothing is more dangerous than an idea if it is the only one you have.*

**Emile Chartier A.K.A. Alain, French Philosopher**

*The best way to have a good idea is to have lots of ideas.*

**Linus Pauling, Nobel Prize Winner**
Centuries of investigation into problem solving have resulted in a clear consensus that the process requires three steps:

1. Understand the problem.
2. Identify alternative solutions.
3. Select the best among them.

John Dewey described them as: recognize it, weigh alternative claims, and form a judgment. And Herbert Simon called them intelligence, design, and choice.

So far, the process of designing solutions has focused solely on understanding the problem or gathering intelligence. Now it’s time to develop alternative solutions and select the best among them—that is, design solutions and choose from your designs. Switching from converging on a problem definition and conclusions to diverging to develop alternative solutions not only requires intellectual agility, but is very frustrating as well. Most people want to get on with the job of fixing or improving. Instead, you need to suspend your critical nature and let wild ideas flow without evaluating whether they ultimately will make sense in this context. Remember that if your client asks you whether you considered an idea and you have to say no, the client will always wonder if it would have been a better path to take.

You may be tempted to come up with nothing but straw men once you have developed a solution you like. The way to avoid this temptation is to ask yourself to develop the next best way to reach your objective. You’d be surprised how often the next best way provides insight into a new way of thinking that may become even better than the original solution.

Each of the conclusions in your logic diagram will point to alternatives. For example, you may have concluded that margins can be improved by focusing the sales force on high-margin lines. There are several ways that this can be accomplished, ranging across information, education, and compensation, and all the options associated with each.

To assess which idea or which combination of ideas will work best in your organization at this time requires you to consider exactly what is required to implement each, the likely outcomes you would expect, and the will and skill of the people involved to move forward. In other words, you have to develop each option sufficiently to be able to evaluate it against the criteria that make sense for this particular situation.

Coming Up with Ideas

There are many creativity techniques that you can use to help you get started. Although the most frequently applied is brainstorming, it has some major
shortcomings. When people work in groups, social politics takes over. Those who have more ideas, speak more eloquently, or are higher in the organizational hierarchy may intimidate some people. Others become social loafers, thinking that there are enough people in the room to do the thinking work, so they can sit back and let it happen. Still others may have an idea on the tip of their tongues, but they forget it while waiting for someone else to speak.

The major benefit of brainstorming comes from the piggybacking of ideas. Someone puts forward an idea, which gives someone else another idea, and so on. Asking each person in the group to come up with an idea in turn or say “pass” can lessen some of the problems associated with brainstorming, but this is quite rigid for something that has been billed as a creativity session.

Perhaps the biggest challenge with brainstorming is the overwhelming urge to criticize ideas as they arise. It takes a strong facilitator to ensure the separation of generation and evaluation.

I run a session in one of my classes each semester to demonstrate the flaws associated with brainstorming. First, I ask the group to brainstorm a particular subject—perhaps getting more tourists to Cleveland. I give the group about ten minutes to come up with ideas, which I record on the board. Usually, they come up with between twenty and thirty ideas.

Then I split the class into groups of five students each and ask them to brainstorm another topic: getting more traffic to a Web site. In ten minutes, the groups tend to come up with fifteen to twenty-five ideas each. Without overlaps, this results in sixty to seventy ideas in a class of thirty students.

Finally, I ask the class to sit quietly for ten minutes and individually come up with ideas for a third topic: improving relations between information technology developers and businesspeople. Between 150 and 225 unique ideas result. I’ve run this experiment many times in many different formats. The order of the techniques and the order of the problems to work on make no difference. Having people sit together in a room and individually come up with ideas always maximizes the total number of ideas generated.

Of course, if I had asked students to spend ten minutes at home thinking of ideas, they might have come up with two each if they were a particularly motivated group. The power of the third approach, called the nominal group technique, comes from the pressure of working alone in a group. All of the problems associated with brainstorming disappear, which more than makes up for the lack of piggybacking. And piggybacking can be brought into play when the ideas that have been generated are subsequently discussed with the entire group.

While in class, we never move to the next step of using the ideas to develop real alternatives, but it’s not hard to assume that with a starting point of 175 ideas, there is more potential for success than if there are only 20.
Testing Plausibility

After the wild ideas have been generated, you must turn to the task of creating plausible alternatives. It probably makes sense to group ideas into categories and spend time discussing them along several dimensions: useful aspects of the idea, aspects that are missing and would make it more useful, and what has to happen to make the idea work.

You must be careful to design solutions that are not only logical but also possible and practical. Review the situation and constraints that you outlined at the outset of the project. You must consider what the organization is willing and able to accomplish in addition to what it needs to do based on the “why” provided by your conclusions. And you should provide enough detail so that the client finds out how to move forward as well as what needs to happen.

Al Morrison, from A. T. Kearney, is insistent that his teams always spend some time asking themselves if they are right. On typical teams, junior people see the senior directors nodding and become confident that the senior directors’ experience is sufficient to test the alternatives. Senior people think, “The junior people have done all this work, they’re well trained, and they’re excellent analysts. Their alternatives must be fine.”

Rather than relying on each other, it is much better to ask yourself, “How wrong do I have to be before this alternative doesn’t work?” Ask questions such as, “If the expected returns are only 50 percent of plan, would I move forward?” or “If competitors slash their prices by 25 percent, will the option still work?” In any event, point estimates of outcomes aren’t nearly as reliable as ranges, even though they often seem much more accurate. After all, which would you rather have: a watch that is five minutes slow or a watch that is stopped at 2:15? The first watch is never right, and the second is right twice a day.

When disasters happen, it is often because the team has missed a fundamental constraint. Once a team working with a trucking company in California recommended moving from single trailers to triple trailers to reduce costs. The analysis and the logic were impeccable, and all the facts added up. But the police stopped the first triple that went on the road. Triples were illegal in California at the time.

One way to be sure that your thinking is complete is to develop a story around each alternative. If you can describe each choice in terms of a story of how it would be implemented in the organization and what results you might expect, you have a complete alternative. If you can test alternatives, all the better, particularly if a lot is at stake.

A Final Check: Intended and Unintended Consequences

The final check before you evaluate the alternatives is to think about the system in which they will reside. Think beyond what you hope will happen and predict
the likely reactions of key stakeholders: employees, customers, suppliers, and competitors. If the organization develops a new product, how will competitors respond? How will you respond to their response? You know how you hope customers will react. How else might they react? What will your reaction be to their reaction?

Think not only of direct cause and effect, as in, “If we do A, B will happen.” Think also about the consequences of consequences and how they will feed back and affect your solution. Be sure that your response is not the simple answer, and check again that you are attacking the root cause rather than a symptom. For example, the effect of cutting staff will be reduced costs in the short term, but fewer staff may result in fewer good ideas and a greater need to cut costs next year. Another example of shortsightedness related to costs is the way that many organizations address their product development budgets. If expenditures are based on revenues or profits, the time you feel you do not have enough resources to do so is exactly the time you should invest in product development.

Given all these conditions, you will probably end up with fewer than half a dozen plausible, practical ideas. Be sure you have at least two or three. Then comes the final step in the problem-solving process: choice. You must develop an approach for evaluating the ideas against each other and selecting the one that will best suit this client in this situation.

Choosing a Solution

Kepner-Tregoe, named after the consulting and training company that came up with it, is the method that I first learned to make choices among complex alternatives. It involves developing a list of criteria against which to score the alternatives, coupled with a scoring of the relative importance of the criteria themselves. I once tried to use this approach in a client situation.

Delta (a pseudonym) was the fifth largest insurance company in a southern European country. It employed approximately sixteen hundred employees, forty-six of whom were in the systems department. The company had an NCR mainframe system with 170 terminals attached to it. Annual operating costs were approximately 1.5 million euros. Over thirty-three hundred programs had been written to support the processing of the organization’s transactions. Yet the existing systems were completely inadequate. Because the systems department was unable to keep pace with new requirements, new applications were typically partial solutions that did not meet user needs. Part of the development burden was the result of systems that were not integrated and, consequently, were difficult to maintain. It was clear that the entire mess would have to be replaced.
The organization’s first option was to bolster the system’s department and ask it to develop new systems in-house. However, because Delta was a government-owned company, the salary range was limited, making the recruitment of high-caliber professionals difficult. For the most part, the systems department consisted of long-time employees with out-of-date skills; rare new recruits were usually unskilled and did not stay long with the company. (The average tenure of the systems staff was seventeen years.) Based on the systems department’s initial estimates, in-house development would take approximately eight hundred person-months and forty-four months of elapsed time. The systems department expected this alternative to cost about 1.2 million euros.

The second option was to purchase a package that would run on the existing hardware configuration. Unfortunately, only one package, XSA, had been found that would run on NCR equipment, and it would require a great number of modifications to meet the country’s complex insurance regulations. There was no local customer support for the XSA, although the vendor, located in Britain, assured us that it would provide adequate support. The XSA screens and reports would also have to be translated. Up to now, four XSA systems had been installed, one on an NCR machine and all of them in Britain. The vendor had not made time and cost overrun information available. The sales consultant estimated that it would take twenty-one months to install XSA. The cost of the package (including installation) was 3 million euros.

Delta’s final option was to purchase a state-of-the-art package, INS, that ran on IBM equipment. Although this system had never been installed locally, it had been installed at over thirty sites in seven other countries in Europe. Time and cost overruns had been experienced on approximately 20 percent of INS implementations. The vendors of INS estimated that development would take eighteen months. The cost of the package (including installation and the replacement of the NCR equipment) was 7.2 million euros.

We dutifully developed a long list of criteria to determine which option would best meet Delta’s needs. Then we spent many hours haggling with the people in the systems department about the relative weighting of the criteria. Finally, we did the arithmetic and found that the differences among the alternatives were not great enough to choose among them. Although it was perfectly clear to the consulting team that INS was by far the superior product and well worth the associated cost, we couldn’t make the numbers work out when we used a democratic process.

The main problem we encountered was the client team’s resistance to assessing the risk associated with each alternative and the “right” number to use to estimate the length of time it might take to implement each of the solutions. While it was clear to us that the systems department was incapable of developing...
a solution on its own, it was not clear to them. And even when we made it clear to the CEO, he was unwilling to jettison his long-time, loyal employees.

It turned out that we were solving the wrong problem. Delta wanted to find a way to help the systems organization work better, not a better way to run the insurance business. No amount of finagling with criteria would get us to the answer the organization was ready to hear. We were choosing among options that it was not willing to entertain. Hence, the first lesson of making choices is to be sure that the choices are real; in other words, be sure the organization is willing to accept them and take action. If the organization is not willing, the choices should not be among the list of alternatives.

Providing valid choices implies that organizations are monolithic, unchangeable entities that are not open to discussion and persuasion. Chapter Ten will discuss how you can tell whether your options are possibilities or not-now, not-ever straw men. The effort that you have undertaken to this point in the process will help you to be sure that, at a minimum, the choices you put forward are based on sound logic.

Assessing Options

If you have determined that you have more than one legitimate option and, consequently, the need to assess various options against each other, there are at least three psychological pitfalls to be wary of:

- Plasticity—when the wording of a question influences the answer provided
- Intransitivity—inconsistency in a sequence of choices
- Design bias—when independent choices influence each other because of the order in which they are made

**Plasticity.** Most people take larger risks when the potential outcome is negative and smaller ones when it is positive. Which would you choose in each of the following:

- Alternative A: A 50 percent chance of gaining $1,100
  OR
- Alternative B: A sure gain of $500

- Alternative C: A 50 percent chance of losing $1,100
  OR
- Alternative D: A sure loss of $500
Most people choose alternatives B and C even though A and D have higher expected values. The long-run implications for organizations are disastrous. Over time, people will decide organizations into bankruptcy. Whenever there is a great idea, they are cautious; when things are definitely getting worse, they take dumb risks.

At the same time, it is easy to convince people to take the sure loss by couching it in terms of insurance. Most of us would rather have a sure loss of a house insurance premium year after year than risk a huge loss once. You cannot count on rationality when giving people choices. Propensity to take risk and the way the choices are worded have a great deal to do with the answer you receive.

**Intransitivity.** Most of us would believe that if you prefer option B to option A and option C to option B, you would automatically prefer option C to option A. However, when you are making decisions based on more than one dimension, this principle, called transitivity, doesn’t necessarily hold.

Consider the three possible solutions in Table 9.1 and the following decision rule. If the difference in completeness between any two solutions is equal to or less than 10 percentage points, choose the solution that is quickest to implement. If the difference in completeness between two solutions is greater than 10 percentage points, choose the most complete solution.

In following the rule, you would choose B over A, C over B, but A over C, because although A takes three months to implement, its solution is more than 10 percentage points better. In this simplistic example, the implications of making selections based on more than one dimension are challenging.

In reality, the choice is probably still more complex because the trade-offs we make don’t run in straight lines. For example, we may decide that 10 percentage points is not enough to warrant a longer implementation, but we may also decide that 20 percentage points is worth it if it takes 50 percent more time, but not if it takes 100 percent more time, and certainly not 200 percent more time, as is the case in the example. There is usually an optimal solution based on several complex relationships that we use expert systems to solve for repeating problems such

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**TABLE 9.1. SOLUTION DIMENSIONS.**

<table>
<thead>
<tr>
<th>Solution Alternatives</th>
<th>Solution Completeness</th>
<th>Months to Implement</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100 percent</td>
<td>Three</td>
</tr>
<tr>
<td>B</td>
<td>90 percent</td>
<td>Two</td>
</tr>
<tr>
<td>C</td>
<td>80 percent</td>
<td>One</td>
</tr>
</tbody>
</table>
as loan approvals, but that most people aren’t willing to sort through for a single decision such as which software to select. Instead, they focus on intuition and loud voices.

The committee problem is another example of intransitivity. Let’s say that rather than trying to sort through all the trade-offs and arithmetically determine the best solution, you decide to let people rank-order their preferences. The person facilitating the meeting may end up with complete control over the result if there are mixed opinions.

Consider the voting in Table 9.2. Adding up the preferences results in a tie, so that gets you nowhere. You could try to delete options one at a time. If you want to be sure that the solution selected is to speed up development of product C, you must not allow a direct comparison between closing Division A and speeding up development of product C, since three of five people prefer closing Division A. Instead, you would first conduct a comparison between cutting the budget and closing Division A. The option to close Division A would be discarded, and you would be left with three people preferring speeding up development of product C to cutting the budget by 10 percent. If you prefer closing Division A, you’d make the comparison between speeding up development and cutting the budget first. If you really wanted to cut the budget, you’d compare closing Division A and speeding development of product C first.

Obviously, this is a contrived example to make a point. Nevertheless, it demonstrates the hazards associated with making choices.

It’s not always clear what to do, but voting is never a smart solution. When you vote, there are winners and losers. It is much better to let the data sort out the differences and if the differences can’t be sorted out, to admit that too.

One project team Mike Hastings worked with was in a panic because the main options they were evaluating came out equally. “Mike, how can we make a recommendation to the chief executive?” “You can’t, guys. Just tell him what you have found.” They did, and the chief executive responded, “Thanks, team. Great job. It is just as I suspected. You have given me all the information I need. I get paid a big salary to make choices like this.”

<table>
<thead>
<tr>
<th>Solution</th>
<th>VandeRoy</th>
<th>Smith</th>
<th>Ghopal</th>
<th>Chung</th>
<th>Obihara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut each budget by 10 percent</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Close Division A</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Speed up development of product C</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
**Design Bias.** Perhaps the most insidious of the problems associated with developing criteria and evaluating options is deciding what to do first. If you develop criteria before you create alternatives, you risk developing only alternatives that fit within the criteria. You subconsciously evaluate at the same time as you create, resulting in stifled creativity and poor choices. But if you develop the evaluation criteria after you have designed the viable options, you may slant the criteria in favor of your personal choice. The best way to separate design and choice is to have different people undertake each task.

**Selecting Criteria**

The most obvious criteria with which to evaluate options are time, cost, quality, and risk. Although I discussed acceptance earlier in the chapter and no alternative should get this far without being acceptable to the people who matter, I include it again with the other criteria to be sure you’ve considered it thoroughly:

- **Acceptance**—Are the client and stakeholders willing to take on this option?
- **Risk**—How great is the chance that you won’t realize the benefits you hope for?
- **Time**—How long will the option take to implement?
- **Cost**—How much will it cost?
- **Quality**—How well does it achieve the objective?

The client situation will provide insight into how to assess these criteria (other than acceptance). Figure 9.1 provides the ends of the continua that you may want to bear in mind. For example, is your client willing to invest in a strategic solution, or is the situation so desperate that a tactical fix is all that is worth considering?

**FIGURE 9.1. RANGE OF SOLUTION OPTIONS.**

<table>
<thead>
<tr>
<th>Strategic</th>
<th>Tactical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leading edge</td>
<td>Tried and tested</td>
</tr>
<tr>
<td>Complete or &quot;Big Bang&quot;</td>
<td>Incremental</td>
</tr>
<tr>
<td>Painful</td>
<td>Painless</td>
</tr>
<tr>
<td>Revolutionary</td>
<td>Evolutionary</td>
</tr>
<tr>
<td>The ideal</td>
<td>Affordable</td>
</tr>
<tr>
<td>High risk</td>
<td>Low risk</td>
</tr>
</tbody>
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Remember that it will be difficult for the client to implement something over which she has no control. When considering alternative actions, look only at those that are within her realm of authority. If that is too constraining, you need to work with her to involve others in the implementation process.

These items are not mutually exclusive. Most clients would love a painless, low-cost, low-risk solution that provides a revolutionary, leading-edge, and complete answer to all their problems. It would be easier to boil the ocean.

Summary

The key to designing an appropriate solution for your situation is developing alternatives from which to choose. The first idea is rarely the best. Although taking the time to consider alternatives seems to be wasted effort, it reaps significant benefits most of the time. When selecting among alternatives, focus not only on their elegance, but also on the will and the ability of the organization to implement them.

Once a solution has been agreed to, it is important to determine what is involved in its implementation. Giving the client a to-do list with seventeen items on it is unlikely to meet with success. She needs a road map for how to proceed with details about the steps to take and their order, as well as appropriate timing and staffing. Detailing solutions is almost exactly the same as putting together a project work plan. You need to consider what, who, how, and when.

Chapter Ten discusses what you should consider as you plan to implement your chosen solution.