This is the touchy-feely part of the book. Before you say “Ick!” and chuck it as far away as you can, please read on. Most “average” people find the people who gravitate to the world of electrical engineering a strange lot. If it weren’t true, *Dilbert* simply wouldn’t be funny. From the point of view of the EE, the rest of the world often doesn’t seem to “get it.” If you want to be the most successful engineer you can, there is some touchy-feely stuff you ought to chalk up on your list of acquired skills. Yes, it is extremely likely that these are going to be acquired skills; the engineer who comes by these capabilities naturally is a rare breed.¹

**PEOPLE SKILLS**

One difficulty engineers often have in dealing with people is the fact that interactions between us human beings can’t be described by slick mathematical formulae like the various circuits they are working with. I personally think this is why you often see engineering groups managed by nonengineering majors.² So, what should you do? One thing I have found is that, though there is no

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¹I might venture that these are the people like Steve Jobs, Bill Gates, and other famous and now very rich self-avowed techno-nerds. Maybe if you can grasp these skills that type of success will be in your future. Trust me, it is much easier for you to develop socially than it is to teach those other types how to pick apart a circuit!

²If you dig deeper, you will find that these types of managers can somehow interpret typical “sparky speak” into language that is less analytical and somehow more socially skilled types can handle.
perfect equation to describe people, there are some categories into which you can sort people to help you understand how to interact with them.

In any business organization there are levels of hierarchy—there is no round table. Someone sits at the head and it goes down from there. There is always a pecking order, even if it isn’t on the org chart. Let’s sort the personality categories into various levels of interaction, since that will definitely affect how you should react. We might as well start at the top.

Note that I am using masculine pronouns in these people descriptions for convenience only. Of course, all these people can be either male or female. Maybe someday we’ll invent some effective gender-neutral pronouns. Until then, please feel free to use the pronoun that offends you the least or makes you laugh the most!

Those Over You

This means your boss, the person you report to, and the person who takes responsibility for what you do. Of course, that is in a perfect world. First, some general rules:

- Avoid talking smack about your boss. Even if he deserves it, constant griping and complaining will usually hurt you more than him.
- Maintain integrity. Sometimes lying and deception can get you ahead in the short run, but in virtually every case it will come back to haunt you.
- Help your boss succeed. This can be hard sometimes, especially if your boss never gives you credit, but even if that is the case, be a great employee. Someone will notice.

The following sections contain descriptions of some boss types.

THE DILBERT BOSS

This is the clueless boss. He has no idea what you do, and he is more concerned with his position than with the success of the company. He is more than willing to sacrifice one of his employees to make himself look good. This is the type to take credit for everything you do right and blame you for everything that goes wrong. First, do the best job you can. Your boss’s own self-interest

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3I am well aware that there are plenty of boss types who will take all the credit when you do good and lay all the blame at your feet when you screw up. I truly hope you are never saddled with such a boss, but read on for some rules that will help if you are.
will keep you around if you are a valuable employee. Second, look for opportunities where others in management can see your skills. This will counter the fact that your boss tries to hide you away. Transfer out of this group if you can, since it will be difficult to get far with this boss.\textsuperscript{4}

**NEGOTIATOR BOSS**

This is the salesman type, the supreme negotiator. He will always set the goal beyond any reasonable point, figuring that somehow this will encourage you to go further than you think you can. First, don’t be discouraged by these requests. After that, you have two approaches you can take. Be a negotiator yourself—overestimate the time and money it will take to get the job done so that you have room to negotiate (like Scotty does for Captain Kirk on *Star Trek*). The other option is to say what you can do and stick by your guns. Don’t underestimate with the negotiator, though—he will be disappointed when you don’t meet the goal you said you would. The negotiator is not necessarily a bad boss to have. You could do much worse. “Better to aim for the sun and miss than aim for a cow pie and hit it,” is the creed of this boss.

**THE “YES MAN” BOSS**

The “yes man” is the submissive boss. He tells his boss anything he wants to hear and will often not defend his employees. It is not unusual for this boss to commit you to impossible deadlines and tasks. Don’t make the mistake of being a yes man to a yes man, though—that is a disastrous combination. Let this type of boss know what it is really going to take to get the job done. If you have a strong personality, you can help this boss by standing up for him if he does say what it’s going to take to get the job done to his boss. Generally this boss will give you the credit for both your successes and failures.

**THE MICRO MANAGER**

The micro manager tries to manage every detail. Try to handle his status report requests and required updates as quickly as possible so that you can get back to business. He might even be so obstinate as to be upset when you try to make a decision for yourself.

I think the best way to deal with this type is to simply make sure you get those reports and updates in on time. Try to be so reliable that this boss will gain

\textsuperscript{4}This is the “dud” that you will learn about later who was somehow promoted to management. Yes, that happens, and if it is prevalent in your company, it’s best that you start looking elsewhere for employment.
trust in you. Often you can talk to this boss easily (there will certainly be enough meetings with this guy). Talk to him about your priorities often, and stay in sync with his goals for the department. As long as he doesn’t carry it to extremes, you are better off with this guy than the Dilbert boss. So don’t feel too bad for yourself.

THE MACRO MANAGER
The opposite of the micro manager, the macro manager is the boss who is never there when you really need some help. He is hard to get hold of and often difficult to talk to. This leaves you making a lot of decisions that you might not feel comfortable with. You might even be criticized for decisions you’ve made after you asked repetitively for some feedback on that particular issue without response.

The best thing to do in this situation is to take advantage of the opportunity to learn to make decisions on your own. You might screw up, but that is a risk you take in any decision situation, so don’t be afraid of making a mistake. If your boss does question your reasoning, try to explain your decision process. Remember, he wasn’t there for all the things that led to your choice. Don’t assume that he has the background on the issue that you do. The best thing about this boss is the opportunity you will have to shine. You will be given plenty of rope; try not to hang yourself!

THE PERFECT BOSS
The best boss gives you some credit while buffering you against mistakes, giving you a chance to learn and grow. If you have this type of boss, do your best to succeed and you will! You should hang on for the ride. Often he will give you plenty of leeway to succeed. He will recognize that his success depends on yours, and he will help you succeed. Don’t be upset if this boss gets some credit for something you did. If he is a good boss, he created the environment that allowed you to be a success and deserves a nod for that. Often, as this boss succeeds, you will as well because he will bring you along with him.

YOUR BOSS’S BOSS
You might not get a lot of interaction with your boss’s boss, but take care when you do. This is the most visible you will get as an employee. Try not to be too nervous. I remember one time I was dealing with the CEO of the first company I worked for. Our production line was shut down because of an electronic power problem. I was a lowly part-time student tech in the QC department. I had just figured out the problem when he came to the line to see what was
up. I was shaking in my shoes as I showed him the cause of failure. He didn’t believe me at first, so I showed him a broken one, fixed it, then broke it again. He was satisfied, and production started back up. It only took two or three more of those situations and the CEO knew my name. If I had panicked in that position, no matter how right I had been, the results for me would have been a lot worse.

THOSE OVER YOU SUMMARY

A point to consider with these categories is that it is possible to find variations of these types. After all, as we said originally, this people stuff isn’t an exact science. If your boss is a blend of these types, you will probably have to blend your response as well. If it helps, make up your own boss type; figure out his or her attributes and what seems to make him tick.\(^5\) Use what you figure out to guide your choices.

Those at Your Level

Ah … your coworkers, your fellow peons, and sometimes your enemies. This level of interaction with your network of peers is the best place to create future opportunities. The following subsections describe some peer types.

THE SNEAK

Watch out for the sneak. He is always trying to see what he can get away with. He will only work hard when the boss is watching. Don’t get caught in any of his schemes to take advantage of the company. That usually turns out badly and gets you branded as a sneak as well.

THE POWER MONGER

A true political figure at work, for the power monger it is very important to build power and reputation. What is sad is that he might try to make you look bad to make himself look good. Try not to give him any ammunition that he can use to prove how badly you are doing, thus making him look better. You can make alliances with this guy pretty reliably, but it will be an “I scratch your back, you scratch mine” type of relationship. If you make deals with this person, you will need to hold up your end of the bargain, since you will be relying on his self-interest to hold up his end.

\(^5\)Take caution to not expect the same behavior every time. Remember, people aren’t as predictable as a circuit. Even so, this can be a very effective exercise. It will help your career more often than not.
THE BADGER

The badger will tend to respond emotionally to situations. If she feels she is being attacked, she will likely get defensive and angry like a badger when cornered. The best thing to do is back down and give her a chance to calm down. If you can help this person get past the emotion (or just wait it out), you can usually reason with her. It is not unusual that the badger is also a workaholic. Maybe that is why badgers are so ornery.

THE AVERAGE JOE (OR JANE)

Companies are filled with average Joes. These people do a decent job, nothing stellar, but are fairly reliable. I believe that if it weren’t for average Joes, companies could never be formed and kept together. These people like the security of someone else making the tough decisions. They will often ask you what they should do. Average Joes like to look to a leader. If you can gain their respect, others will notice and it could lead to a promotion.

THE SHOOTING STAR

These are the guys (or gals) who get it. They work hard but don’t make themselves into badgers. They are reliable and often correct in their decisions. True shooting stars possess integrity and a desire for the company to succeed. They often get promoted as these skills are recognized. This is a good friend to have in a company, but hopefully after reading this book you will be the shooting star that everyone else wants as a compatriot!

Often the shooting star is a leader and a true mentor; even if the organization chart doesn’t show it, you should listen to the star’s advice whenever you can.

THOSE AT YOUR LEVEL SUMMARY

One of the most important things to have at this level is respect, for yourself and for the others you deal with. You gain respect for yourself by following through with what you say you will do. Stick to your word. If you make a mistake, say so, correct it, and move on. Give others a chance to build respect at the same time as you. This mutual respect is a way to build a network of contacts that is synergistic in nature. Here is where you and your colleagues can help each other out, do each other favors, and be more successful than you would be on your own.

Those Under You

You might be looking for a chance to lead or have had it forced on you. Either way, you ended up with some subordinates who answer to you. This is
commonly the hardest adjustment for the true engineer type. As these people below him on the org chart interact, he or she will be baffled at the behaviors and personality traits that come out. Here are a few buckets to sort them into.

THE SMART SLACKER
Smart slackers are usually pretty smart and can get a job done more quickly than most others in the group. For this reason they might get some free time when others don’t. But they don’t go looking for any more work—they goof off or spend the time surfing the ‘Net or other such things. Usually they are quick enough on the keyboard to get back to looking busy when you walk by. Keep their plates loaded to the brim. If their slacking becomes a big problem, you might need to call them in and discuss it.

THE PRAISE DEPRIVED
Praise-deprived employees often need daily feedback on how they are doing. They are looking for positive reinforcement and need a little praise. Be sure to let them know when they are doing a good job. Don’t be afraid to be constructive if they make a mistake or should try a different approach. They will usually let you know if they are done with a task and need more to do.

Sometimes as a boss, you will wish they would just leave you alone, since they can seem a little needy. If they are valuable employees, spend a few minutes with them as needed. They will be very loyal for that little time you spend. If they aren’t so good, ignore them and they will find a job elsewhere, solving the problem for you.

THE DUD
The dud is the person who doesn’t bring a lot to the table. You have to put more work into him than you are getting out of him. That said, I am a firm believer that people can change and improve. I prefer to give them a chance, but be firm in laying out the expectations. Let him know what is needed from him to keep him employed.

This, however, is not a situation that you can keep dealing with forever without draining resources from the company. If he doesn’t change, this is the person that you have to make a hard choice with, the one you have to let go. Don’t run your group with a drain on resources indefinitely. It will hurt all of you in the long run.
THE AVERAGE JOE (OR JANE)
This is the same guy we talked about earlier. Be a leader for him, show him how to excel, and you just might turn him into a shooting star.

THE SHOOTING STAR
The shooting star is the same kind of person we already discussed. Most important: The more of these you have in your group, the better you will perform! Don’t be afraid of giving him or her credit, and don’t try to suppress any one of them into being your peons. It will backfire on you. Share the credit and hook your wagon to these people; they will get you to the finish line!

FINALLY
Can a truly effective manager get an average Joe or Jane to become a shooting star? Or make a dud into something more? I think so, and I believe it is the mark of a good manager to do just that. Anyone can yell and intimidate people into doing what they want. The manager who persuades and edifies is much rarer and also more valuable. His or her team will be more efficient, have less turnover, and just get more stuff done. It doesn’t mean you should be an old softy. You might need to be firm at times, but if you truly care about your employees, it will show and make a difference.

Administrative Assistants
Every organization has an underground method of communication. In most companies it flows through the assistants. Building a good rapport with the secretaries and assistants is a good idea. It will allow you to tap into a whole other communication structure. If they think well of you, you will have a better reputation with those above you. Help the assistants whenever you can, and treat them with respect. A lot of unsung greatness lies with the assistants in an organization. This applies to your assistant if you have one. Don’t ever degrade them; it will come back to bite you. If they respect you, it will proliferate through the network and help you. If they don’t respect you, that will travel the network and hurt you. This doesn’t mean you just let them goof off all day. As individuals they will fit into the categories we’ve described and can be dealt with similarly, with respect.

BECOMING AN EXTROVERTED INTROVERT
It seems to me that, generally speaking, the personality types that do well in engineering seem to be naturally shy. I would have to say that electrical engineers are probably the most introverted of the bunch. I was once asked, “How do you tell whether you are talking to an extroverted engineer?” The
answer: “He is looking at your shoes, not his own.” It’s funny because it’s true. It is also true that the EE can benefit by overcoming this tendency. Here are a few ways to do just that.

**It All Depends on Your Point of View**

A wise man once said (and I’m paraphrasing), “You will find that right or wrong often depends on your point of view.” Given that, I will try giving you an idea of the way things are seen from the most common sides of the fence. For this discussion we will call the engineer the peon and the manager the pointy hair.

**THE PEON POINT OF VIEW**

The decisions and directions of management are often as undecipherable to the typical engineering peon as ancient Egyptian hieroglyphics are to the average person. Here are some insights into the thoughts that go through a typical EE’s head when dealing with a pointy hair: “Why in the world is this the most important thing now when just yesterday it was the last thing on the list?” Or maybe, “Why can’t you understand things like the word *impossible*?”

In my early years as a peon I coined the phrase, “Management is an unnecessary evil.” It accurately summed up my thoughts on the topic. If your manager couldn’t help you with fixing that circuit that wouldn’t work right or the code that just didn’t execute the way it should, what good was he? I mean, sure,

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6 Obi Wan Kenobi said this; some great life lessons can be learned from *Star Wars*!
7 Yeah, I keep lifting phraseology from *Dilbert*. What can I say! Scott Adams struck a chord that rang true throughout the corporate universe!
he could keep buggin’ me all the time about status reports and the like, but couldn’t I manage my own time?

Even if you find engineers with a manager that they like and think is very helpful, they are still at a loss to understand management decisions. This is often due to a lack of background on the decision process. Good managers will often help this situation with some explanation as to the way they came to the decision. Engineers, though usually a little underdeveloped in the social skills area, still understand numbers and reasons. It helps them to know why.

There is a natural angst in the role of the engineer vs. the manager. After all, he is the peon in the relationship. At the end of the day the manager is his boss, not the other way around. Remember, engineers spend their whole lives asking themselves, “Why this?” and “Why that?” It is what they are trained to do; it makes them good engineers. Help them answer that question if you are a manager!

THE POINTY-HAIR POINT OF VIEW

First, understand the first and foremost goal of a manager: It is to make the business successful. It’s either that or to make the department he is managing look good, which coincides with the first unless it is sacrificed for the second. (This can happen with bad managers. Hopefully their bosses will notice and correct that before it is too late.)

The good manager wants a successful company; how do you do that? It is pretty simple really; you make more money than you spend.

Where the engineer is more focused on accomplishing the task at hand, the pointy hair worries about getting it done on time and on budget. This often puts the peon and the pointy hair on opposite sides of the fence. It is difficult for a manager to understand that unknown things can come up that mess up the estimated schedule the peon gave him. Here’s an actual quote from a manager: “We need to figure out a way to predict unknown problems from happening and avoid them.” He was completely serious.8 To him, that is how to get from point A to point B. To the engineer who is trained to think logically, this phrase will cause his brain to strip a few gears, leaving him generally speechless and unable to respond.

It is not a bad thing to think so far out of the box.9 If the engineer can shift his head back into gear after such a phrase and look at it as a problem to solve,

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8I was personally flabbergasted at the time; this was before I developed my personal understanding of the pointy-hair point of view.
9I’ve seen pointy hairs so far out of the box that I wasn’t sure there was even a box around!
you will be surprised at what you think up. It is logically true that you can’t predict things you don’t know. However, you might come up with a way to find out some things you didn’t know before, and avoid those. Which is what that “pointy speak” really means.

When two engineers start talking, you will often see pointy-hair eyes glaze over as if you were speaking a language they don’t understand, which you are. To keep them interested, use words like schedule and budget a lot. Managers like to speak in absolutes, as in “This will be done in such and such time and cost so much.” Engineers like to have some fudge factor. They have seen too many failed lab experiments to believe it will always go right the first time.

In my experience, if you tell the pointy hair it will cost between 10 and 15 bucks, the only price he hears is 10 bucks. This being the case, if you aren’t sure you can get to the low price, you’d better not say it, no matter how often he tells you not to sandbag your numbers. If you have some confidence, though, go for it—it is also the mark of a good engineer to get to the committed price and schedule, even if it takes some extra effort. Take caution, however—you don’t want to sandbag a number so high that you never build anything because it is always too expensive. Remember, the goal of a business is to make money, and you can’t do that unless you make stuff and sell it.\(^\text{10}\)

**TALK IT OUT**

If the engineer makes an effort to lay off the acronyms and the manager tries to explain some of the reasons behind his decisions, it will do wonders for your mutual understanding. The most important thing you need is a desire to understand each other. We’ll get into the skills a little later.

**Visualization**

A few years ago, as I watched an interview with Michael Jordan, I realized that we have something in common. No, it is not a 40-inch vertical leap or the ability to dunk the ball. I realized that for years I had been using a method for success that Miracle Mike also used, a technique called visualization.

Everyone who works for a living experiences difficult and stressful situations. It might be dealing with an irate boss, a lazy employee, or a fellow manager who just doesn’t seem sane. Have you ever left a difficult situation in which you were trying to argue your case when you suddenly thought, “I should have

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\(^\text{10}\) Unless you are doing government work, and that is a whole other philosophy!
said blah, blah, blah or yada, yada, yada?” You might be saying to yourself, “Hindsight is 20/20,” but what I am about to tell you is how to turn that hindsight into foresight.

I remember one of the first conversations I ever had with a CEO. I was a lowly engineering student; he was the boss of a $700 million company. He hit me with a couple of questions that I was not prepared to answer. I still remember how my mind drew a total blank. Afterward, as I thought about it, I knew exactly what I should have said. I decided that I would not go into such a situation unprepared again. But how do you prepare for something like that? This is what I did.

I started to imagine myself in the situation beforehand. I would imagine how the conversation might go. He would say “this” and I would respond with “that.” In my imaginary situation I would try out several different approaches and then imagine a response. I would visualize the person understanding my point and a resolution to the case at hand that I desired. I found that when I did this, the real conversation, when it occurred, followed my imaginary one so closely that I always knew what to say. And better yet, I usually got what I wanted out of it.

You might think I am full of it, but I have used this technique to visualize getting raises and promotions, and I can honestly say that I got what I asked for in nearly every situation. It actually amazes me when I look back at it. I was promoted into engineering positions when I was still a student. Later I worked with several people, including a former boss, as an equal or superior. I could hardly believe this happened to a naturally shy person from a hick town in Utah, a person who doesn’t like confrontation.

There are no set rules for how to do visualization other than the more often you do it, the more successful you will be with the technique. If you imagine the ball going in 1,000 times, the next time you have to shoot that clutch shot, it will go in. It works for Mike, and it works for me. Give it a try.

**Affirmations**

One of my favorite *Saturday Night Live* skits is the one where Stuart Smalley says, “I’m good enough, I’m smart enough, and doggone it, people like me!” He mocks a technique similar to that of visualization. It is called *affirmation*.

If you get into quantum mechanics, there is a rule called the *Heisenberg uncertainty principle*. It was developed to understand some interesting experimental results in which quantum particles (everyday light being one of these particles) act like a wave in one experiment and like a particle in another. The problem is,
they can’t be both all the time; the behaviors are mutually exclusive. Anyway, a
general conclusion of this principle says that when you measure something at
the quantum level, the very act of observation affects the outcome of the mea-
urement. You, the observer, basically get what you are looking for.

Please bear with me for a moment while I digress into very unengineering-like
metaphysical rumination. If you get what you look for, can you affect the out-
come by looking for what you want? This is what affirmations basically say you
can do. Affirmations are a lot like the visualization technique we discussed but
taken to the next level. You not only imagine what you are going to say or do
in a given situation, you imagine the outcome you want.

I know it sounds hokey, and I admit that it is not a perfect process, but I also
believe it works. Take any goal you want to achieve and write it down 30 times
every day, such as “I will get a book published,” or “I will get a raise,” for exam-
ple. Give it six months and see what happens. My experience is that it does work;
you’re reading this book, aren’t you? Guess how I started that ball rolling.11

One thing that definitely happens when you use affirmations is that your mind
spends considerable time pondering what you are looking for. This, I believe,
leads to recognizing opportunities when they come your way so that you act
on them. Several years ago I had on my long-term goal list a desire to publish
a book; it was a goal I affirmed regularly. I thought about it a lot. Then, while
reading an electronics magazine, I saw an ad for writers. I sent in a reply and
they asked for a copy of my work. I sat down and wrote my first column. It was
a success and I began writing. One opportunity led to another and here I am
achieving the goal I had set out to do. Imagine, however, if I hadn’t had this
on my mind when I saw that first ad? Would all of this have happened? I don’t
think so.

You get what you look for, so control your destiny. Say to yourself, “I’m good
enough, I’m smart enough, Insert your desire here, and doggone it, people like
me!” Works for Stewart, works for me, and it will work for you, too.

**Breaking Out of Your Shell**

These techniques work very well in helping the naturally shy person to break out
of his shell. If you can overcome the natural shyness so common to engineers

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11It is no coincidence, in my opinion, that the techniques of visualization and affirmation
mirror that of faith and prayer so closely. I think they are principles that simply work.
and learn a bit about the people around you, it will give you career opportunities you might never get otherwise.

The hardest part of breaking out of your shell is taking that first step toward doing it. You have to make the first step. After that each one becomes easier. For example, you need to make a phone call that you really don’t want to make. You have already spent plenty of time visualizing it; you have thought through all the possible things that might happen. Now you are stuck—you simply don’t want to make the call. It is not uncommon to feel apprehension at this point. Don’t give up hope, though; there is a way through it.

First, clear your head and stop thinking about what is going to happen; concentrate on one thing—picking up the phone. Once the phone is to your ear, worry only about dialing the number, nothing else. After someone answers, worry only about initiating the conversation. Once it starts, the preparation you did with visualization will kick in and from there on things will get progressively easier.

**Repeat**

Though it will get easier each time you go into a specific situation, these are not skills you can learn once and then forget about. They require repetition, a *lot* of repetition, not unlike learning to play an instrument or speak a different language. The more you use them, the better you will become at them. Find out the way these skills work best for you and practice them.

I still encounter situations today where I use these skills that are more than 20 years old for me. They still work, and I keep finding new ways to apply them. And yes, I still get nervous when it is time to talk to the CEO, but now it goes much more smoothly.

### Thumb Rules

- To the engineer, many management decisions don’t make sense unless they know the why behind the what.
- Managers have difficulty understanding techno-speak.
- Talk it out till you understand each other.
- Visualize the situation, what is going to happen, and what you will say.
- Write your goals down 30 times a day till you achieve them.
- Break out of your shell one step at a time.
- Practice makes perfect; keep working on these skills forever more.
COMMUNICATION SKILLS

Engineers are notorious for their poor communication skills. I was once asked why it is that engineers who deal in logic that is either true or false have such a hard time answering yes or no to a simple question.

It is something that I myself am plagued with. Given a typical question, for example, “Will such and such project take long?” my answer usually begins with, “It depends …” If I’m not careful from that point on, it can quickly lead to my listener’s eyes glazing over.

When you are a better communicator, you will be more successful. Simply put, everything we do in the world today requires communication. It is somewhat ironic that things that enable communication to be better (like the Internet, for example) are designed by engineers who could often use a course on the subject themselves. So here are some pointers.

Verbal

The brunt of day-to-day communication is verbal. It is also the hardest kind for engineering types to handle well. (I think it goes back to that shy thing we were talking about earlier.) However, it is also the most important communication skill to have. Face-to-face verbal communication is the best situation in which you can (a) make sure you are understood, and (b) make sure you understand.

WATCH FOR BODY LANGUAGE

Some say as much as 90 percent of what we communicate in a verbal conversation is in fact not verbal at all. If you really want to get deep into it, there are whole books on this topic that tell you the meaning of things like glancing right or left, up or down, and all sorts of looks. Most of the time, however, I believe that if you simply pay attention, you can get a lot out of how a person presents himself and the way he acts. You have been doing this from a very young age and it comes naturally if you give it a chance. Too often we get so rushed or distracted that we don’t notice simple signs. For example, let’s say that a person on your staff looks uncomfortable when he agrees to a deadline. If you don’t notice and dig deeper, you could have a nasty surprise coming later.

CONSIDER WHO YOU ARE TALKING TO

The background of the person you are talking to should be considered as you communicate. Don’t get caught in the trap of trying to explain details of quantum theory to the CEO who has an MBA. You should try to distill what you
are communicating to the points that matter to the person you are talking to. Take note of one important point, though: Don’t ever treat the person like he is dumb! You can distill information without talking down to a person. If invited to, you can elaborate. You might be surprised at what your boss can understand—especially if he has read this book!

If you are dealing with a person from a different culture or who speaks a different first language, it helps to simplify your phrases to be sure you are understood. Don’t get into vocabulary words that they might not know without being sure they understand what you are referring to. This particularly applies to words that have meaning only in your corporate culture. Everyone perceives the world through experiences they have based on the culture they come from. You don’t need to speak louder. It doesn’t help. Try to enunciate your words, though; if you are like me, you are probably carrying some hick accent that would cause you communication problems in your own native tongue.

**SHOULD YOU GET ANGRY?**

Sometimes getting angry is a correct response. There are occasions when that is what it takes for the person or people to whom you are talking to understand the seriousness of the point you are trying to communicate. You might have no other resort to get the point across. However, it should be rare, and if it is rare, it will carry a lot more weight than if you are someone who pops a cork every time something goes wrong.

**REFLECTIVE LISTENING**

A great way to improve verbal communication is to use a technique called *reflective listening*. The idea behind this type of communication is to further your understanding of what is being said by repeating it back to the person you are talking to. Take care, however, not to be annoying. No one likes a copy cat. The trick is to rephrase it in terms you understand and see if the other party agrees with you. This is particularly useful in dealing with persons from a different culture, say, a guy from engineering talking to a guy from management, for example.

**READ**

I believe that the single best way to improve your verbal skills is by reading. When you read, you experience how others communicate. It works with spy novels to white papers—the more you read, the better you will communicate with others. You will add to your vocabulary, you will understand cultural differences, and you will be able to order your thoughts in a way that is easier for others to understand.
Written

Whether emails, reports, or very official-looking documents, writing skills are extremely important in the field of engineering. Considering that nearly every engineer I have ever dealt with has had some issue or another with writing, I figure this is an often-overlooked skill.

PROOFREAD IT

Writing has one distinct advantage over verbal communication: You can look it over before you print it, send it, post it, or publish it. You should proof every written communication you create. The only question is how much. If it is short and you are going to follow up verbally, a quick glance will be enough. On the contrary, if it is going to be read by a superior or someone who might have reason to pick it apart, go over it a few times.

The most basic skill that I think should be used to proof writing is to read it out loud to yourself to see how it sounds. Don’t forget to pause at commas and stop at periods, as you were told to in grade school. This technique will help you root out all sorts of odd-sounding phrases.

If you are particularly concerned, try it out on someone else and see whether they understand it. Make sure the person has a similar background to the audience for which the document is intended.

USE APPROPRIATE EMPHASIS

In written communication you lose the ability to create inflection with your voice, and you can’t tie body language to what you are saying. This can be compensated for by emphasizing what you are saying with fonts, capitals, italics, boldface, bullet points, and numerous other options. If you SAY SOMETHING IN CAPS, you create the idea of yelling or raising your voice. **Boldface** words can imply importance, and italics can help you draw attention to *something in particular.*

There is, of course, a whole world of winks, smiles, and other punctuation types of communication out there, but I believe, although most will get the smile, the rest is a code that is known to only a few.

Note that I said *appropriate* emphasis. It is easy to get carried away. Don’t cause death by bullets. Use too many bullet points and they no longer have meaning; too much boldface and it does no good; too many caps and people will think you are always angry. The trick is to be *skillful* in applying these skills.
USE VERBAL SKILLS IN WRITING
Some of these verbal skills are a great way to improve your writing skills. Things such as considering your audience and reflective listening (or reading/writing in this case) can help you understand and get your point across.

EMAIL SPECIFICS
Watch out for flame-mail. In the realm of email, it is very easy to be misunderstood, and people often respond with less tact than they might have in person. If you see a flame war starting, I think the best thing to do is talk to the person in person.

Watch the CC list on your emails, take care to whom you forward what, and always consider that what you have written can be easily forwarded to an unintended audience.

Get to the Point
Written and verbal communications have a few things in common. One of them is the importance of getting to the point. Use what you need to create understanding, but don’t over-elaborate. If 10 words will do, don’t use 100. Here are some other ways to get to the point.

USE ANALOGY
One of the most powerful methods of communication is the use of analogy. This works well for trying to explain a problem, concept, or theory. Analogy helps the person receiving information visualize what is being talked about. For example, analogy can help a person understand the details of a topic the same way that a telescope can help you see details of the moon. (Or maybe the apartment next door.)

There you go. I just used an analogy to explain analogy, and possibly a little humor too. Analogy is the art of comparing the new idea to something already known. It works very well.

SKETCH A PICTURE
You’ve all heard the phrase “A picture is worth 1000 words.” Engineers typically get this; after all, they use schematics, which are simply pictures to represent ideas. In the world of email, however, we often ignore what we know so well. We will spend three paragraphs trying to explain what we want when a simple sketch will get the point across. Get yourself a scanner and use it to send a sketch with that email!
WATCH OUT FOR CORPORATE CULTURE CODE WORDS
Every conglomeration of people will develop code words to speed their com-
munication. In a corporation, everyday words will take on completely different
meanings. When you are dealing with people outside the company, be sure you
don’t assume that they know what you’re talking about if you use a corporate
word or phrase.

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<thead>
<tr>
<th>Thumb Rules</th>
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<tr>
<td>Watch body language.</td>
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<tr>
<td>Consider who you are talking to.</td>
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<tr>
<td>Anger is sometimes appropriate, but it should be rare.</td>
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<tr>
<td>Listen reflectively.</td>
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<tr>
<td>Read.</td>
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<tr>
<td>Proofread your written communication.</td>
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<tr>
<td>Use appropriate emphasis.</td>
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<tr>
<td>Use analogy.</td>
</tr>
<tr>
<td>Sketch a picture.</td>
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<tr>
<td>Explain corporate culture code words to those not of your culture.</td>
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ESPECIALLY FOR MANAGERS
Early in my career, I developed an outlook on management that can be
summed up in a single phrase I wrote in my day planner in a boring meeting
many years ago: “Management is an unnecessary evil.” Years later I got my own
“pointy hairs” and I discovered a few reasons for management to exist. (They
might be good and true reasons or simply an attempt to justify my own exis-
tence; you will have to decide which.)

The Facilitator
To facilitate is to make easy or easier. Management should be a facilitator; it
is up to you to create the environment in which an engineer can succeed. You
need to get your engineers the tools they need to succeed. You need to help
translate to your superiors the techno garble that engineers are so fond of. Most
engineers just like to design stuff and really don’t want to be in charge and
manage things. They like to leave that up to you.
**The Buffer**

The best managers are a buffer between the top-level antics of illogical requests with unreasonable timelines and the real world of actual schedules and needs. They bring some order to the world of the engineer out of the chaos of pointy-hair decisions. This is something the engineer needs to be successful. Don’t forget that in their world, it helps considerably if things make sense.

**The Advocate**

Good managers understand their employees and are their advocates. If an employee always has to beg for a raise, he will soon be looking elsewhere for a job. If he or she is a shooting star or even an average Joe, you will find that a reasonable show of appreciation raise-wise is much cheaper than hiring and training a new guy. It is not only right to be the advocate for your employees; it is good for the interests of the company as well. I get sick of hearing managers over-talk recognition and promotion as a way to make an employee happy in lieu of a raise. It is true that these things are nice, but that only matters if basic needs are being met—needs like food and shelter. If you are underpaying too much, no amount of awards will keep employees around.

**The Gift of Focus**

Good managers will develop the gift of focus. I find that this often comes naturally to an engineering type; they sometimes get so focused on the task at hand they might forget to even eat. For managers, though, their day is typically one of continuous and repetitive interruption. You can even get a false sense of accomplishment due to the fact that you are so busy being interrupted. To top it off, interruptions can spill over onto your engineering staff. Take caution that you don’t find yourself constantly interrupting your engineers’ focus. Be sure to find time to focus on your tasks; take advantage of that office door and close it on occasion to allow you to focus on things that need to get done. Keep meetings focused on the topic. Keep your team focused on your goals. Remember, the more difficult tasks require focus to complete. In today’s information-rich world, focus can be hard to come by, so make it a priority in everything you do.

**Understanding Engineers**

Here are a couple of things you might or might not know about engineers but that will help you be a better manager of engineers.
WEASEL ROOM

Engineers need a little weasel room. Have you ever asked an engineer if he is 100% confident he has the solution? If you have, you were likely treated to a look of complete loss. It is not possible for an engineer to be 100% confident in anything. In this discipline you are constantly assaulted with the fact that you don’t and can’t know everything. You discover new ways for things to go wrong daily and are constantly working to fix and prevent them from happening. If an engineer gives you a range, take the conservative number for your estimate. Give the guy a little weasel room. Try to pin him down too hard and it could backfire on you.

THE ETERNAL OPTIMIST

I haven’t met a good engineer yet who didn’t regularly underestimate how long it takes to do something. This is simply a fact: Good engineers by nature are optimistic, and the really great engineers will push themselves so hard that they will meet the optimistic schedules they set for themselves. I heard a rule of thumb once about writing software that I have found to be true: Take the engineering estimate of time a job will take and multiply by three.

DESIRE TO GROW

The better you understand the “sparky” viewpoint, the more successful you will be at managing engineers. If you take this to the next level you can help your engineers take on more and more, literally turning an average Joe into a shooting star or even possibly rescuing someone from dudsville. Most engineers want to grow and become better at what they do, but they need a little encouragement, a chance, and maybe a bit of a buffer against failure.

The Best Manager Is Right Most of the Time

Some time after I decided that management is an unnecessary evil and then later found some purpose in life after being inducted into management, I came up with a formula that describes a good manager. Remember, a manager spends nearly all his time making decisions—what tools to buy, what people to hire, what to do about a particular problem, what to eat for lunch, and so on. How good he is depends on how often he is right. If he is right more often

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12 If you don't get the references to shooting stars, average Joes, and duds, you either skipped a few pages or have a serious memory problem.

13 I believe there is a correlation here: The further up the corporate ladder a person climbs, the longer it takes him or her to decide what to have for lunch.
than not, the company makes money. If he is wrong too much, down the tubes it goes. So without further ado . . .

A good manager is right 51% of the time. A great manager is right 70%, 80%, even 90% of the time. If your decisions are right most of the time, you will succeed.

Remember this when faced with a decision. You don’t have to be right all the time. Don’t let indecision and too much worry prevent you from making a choice. Often that in itself can cause you to fail. Consider the situation, take action, and watch the results. Don’t be afraid to admit you were wrong if you see you’ve made a mistake. Learn from the mistakes and don’t make them again.

**Finding the Shooting Star in a Forest of Average Joes**

One of the most challenging things a manager has to do, after spending an hour or so with someone, is to decide whether that person would be a good employee and hire him or her. As we learned in previous discussions, you really want to stock your group with shooting stars, but how do you find them? How do you weed out the duds so that you aren’t saddled with a problem down the road? Though there is no perfect solution, here are some key points to look for in a perspective engineer.

**DRESS**

Don’t put a lot of value on how a person is dressed. Casual attire is the norm where I work, so unless someone comes in with serious hygiene problems, I don’t chalk up any negative points. Once, however, a potential employee asked what the dress code was. His consideration impressed me. However, it is of minor importance. Our company is interested in results and product, neither of which is significantly affected by the dress of R&D employees.\(^\text{14}\)

**FUNDAMENTAL KNOWLEDGE**

This is very important to me as a manager. There are some skills I don’t want to have to teach you, skills I expect you to know for this position. A degree or some type of schooling tips the scale favorably, but I do not consider it a shoe-in. I have seen too many college graduates who got through school by the “assimilate and regurgitate” method. They passed all their tests with great grades, but they didn’t focus on retaining the knowledge. I weed these people out with questions such as the one shown in Figure 7.1.

\(^{14}\)Okay, that’s not entirely true. When I think about it, the casual atmosphere we maintain makes us more productive, but that comes after the hiring decision, so it doesn’t count.
You might laugh, but being located right next to a major university with a reputation as a good engineering school, I constantly interview fresh graduates who should know this stuff. Fully half the applicants I see get this wrong! The basics are important. If you don’t have them, you are just guessing when you design. Worse yet is if you think you know them and you really don’t. After all the hammering on basics at the beginning of this book, I hope the importance of this concept is understood. I’d rather hire someone with the basics down pat and a 2.9 grade point average than the person that has a 4.0 and stumbles on basic understanding.

**CAN YOU LEARN?**

I have yet to see any employee get into a new job and not need to learn. Sometime during the interview, I will intentionally teach the candidate something new, and then hit the subject later in the interview, to see if he or she has picked it up. This ability to learn quickly and have it stick is important to the success of any engineering group. Technology will quickly outstrip those who can’t learn.

**ARE YOU WILLING TO LEARN?**

You might think this was covered in the preceding question, but I consider it a separate point. I will often ask interviewees a question that I am fairly sure they do not know the answer to, simply to see how they respond. Do they try to BS their way through it? Or are they willing to admit that they don’t know and ask for help? In the rapid design cycles of today, there isn’t time to play games. That means “I don’t know, but I will find out” is an appropriate answer. You can take this to a higher level, too. On call-back interviews, ask a question again that stumped them the first time to see if they were interested enough to figure out the answer.
PEOPLE SKILLS
Is there a job out there that requires zero contact with other human beings? I doubt it. The best engineering teams get along well, which is why I value people skills significantly. How do you handle pressure? Can you get along with people you don’t care for? This is a fairly tough item to evaluate in an interview. I invite my leads to fire questions at the candidate and watch how he or she responds under pressure.

ATTITUDE/MOTIVATION
A positive attitude always impresses me. I quote my father: “Can’t is a sucker too lazy\textsuperscript{15} to try.” I think it is important to believe that something can be done. Look for signs of giving up on a problem. Is the candidate persistent? Does he or she complain during the interview? Does he moan about his last job? I have seen all types. Whiners don’t get hired.

COMMON SENSE
This is all about getting the job done in the least amount of time. Too often a person can be “book smart” but not be able to apply what he or she has learned. If you don’t have common sense you will struggle with applying the knowledge you have. Here is a brain teaser\textsuperscript{16} I often use to determine a person’s level of common sense:

You are standing in a room with two strings hanging from a high ceiling. If you grab just one string and walk to the other, the second string is several feet out of reach (because it is hanging straight down). Your task is to tie the two strings together. You have just three things to perform this task: a book of matches, a single square of toilet paper, and a screwdriver. How do you tie the strings together?

IN GENERAL
Should you be looking for the person who can do differential equations in his head? I don’t think so. I will buy Mathcad for that. I want to know if the candidate has the fundamentals and if he can and will learn the rest.

\textsuperscript{15}Can laziness actually be an asset? If it motivates creativity, it can. Remember, if you give the hardest job to the laziest man, he will find the easiest way to do it. So I guess you could look for motivated lazy people, if that makes sense at all.

\textsuperscript{16}I’m not sure I want to reveal the answer. People who are smart but with less common sense will overthink it too much. (You wouldn’t believe some of the answers I’ve heard!) If you have a high common-sense quotient, you will get the solution in a second and wonder why it was so simple. Email me for a hint if you are struggling!
Remember, great managers are rare; mediocre managers are commonplace. You don’t have to be a great manager for a company to be successful. Why stop there, though? Great managers are huge assets to any company; great managers can turn average Joes into shooting stars can make incredible things happen.

Being a great manager isn’t all that hard. Listen, look, and learn until you are right most of the time. Then you won’t be unnecessary or evil!

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<tr>
<th>Thumb Rules</th>
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<tr>
<td>Management is an unnecessary evil?</td>
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<tr>
<td>Be a facilitator.</td>
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<td>Be the buffer.</td>
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<td>Be an advocate.</td>
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<td>Develop the gift of focus.</td>
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<td>Understand your engineers.</td>
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<tr>
<td>Be right most of the time.</td>
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<tr>
<td>Hire shooting stars; make shooting stars from average Joes.</td>
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<tr>
<td>Don’t be unnecessary.</td>
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<td>Don’t be evil.</td>
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**ESPECIALLY FOR EMPLOYEES**

As an employee your motivation, like the pointy-hair boss you work for, eventually boils down to money. You want to do a job and get paid for it. True, job satisfaction is important, but that comes way second to the need to buy food to eat and have a dry place to sleep. This means that an employee needs to know two things: how to get a job and how to keep a job. This chapter is a guideline to those things.

**How to Get a Job**

It all starts with the interview. Having interviewed more engineers than I care to remember, I have compiled seven definite no-no’s extracted from real

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17Come to think of it, these don’ts aren’t just for engineering interviews; you could make a pretty good case for each one as a rule of thumb in almost any job interview.
interviews. Giggle, laugh, and snicker if you will, but please do not try these during your next interview. The people described in the following paragraphs are professionals.

DON’T BE CONDESCENDING
Be careful how you come across to your potential employer. One candidate I interviewed seemed to really disdain coming to us for a job. It was as though he would work for us if he really had to, but he sure wasn’t going to like it. The “you don’t have anything to teach me” vibe was very strong. Being an engineer who believes the ratio of what we know to what we don’t know is extremely small, I have a tough time with that. This is especially disconcerting when some simple circuit diagrams are requested and you get the response, “Everyone knows that,” a little hand waving, and then nothing is written down and no answer is forthcoming. I immediately think you don’t actually know it, and this is all an act to cover up the lack of knowledge.

DON’T WORRY ABOUT SAYING “I DON’T KNOW”
The stress of an interview might make it the toughest place to say “I don’t know,” but that is not a bad answer. Especially if you follow up with, “I’ll find out, though.” One of the best impressions I had from a potential employee was when he sent me an email afterward that explained the answer to one of our questions in the interview that he didn’t know at the time. The fact that he took the effort to look it up showed perseverance and a desire to learn. That alone will many times make up for a current lack in knowledge.

DON’T LOSE YOUR COOL
One person I interviewed was clearly thrown a bit off balance by some of the questions I asked. What really put marks in the cons column was when he got so upset trying to solve the problem that he threw down his pencil and repeatedly smacked the table. Our work environment can be much more stressful than an interview; I really don’t want to worry about someone going mental on the job.

DON’T GIVE UP EASILY
If you don’t know the answer to a particular problem, try to figure it out if you can. I will often ask questions that I know the candidate won’t know, just to see how he or she handles it. Someone who takes one look and walks away has never impressed me. Remember, while someone is standing there saying it can’t be done, someone else is out there doing it.
DON’T BE AFRAID TO ASK QUESTIONS
Along with the preceding point, you are not expected to know it all. If a person asks a question about a particular task or problem I’ve given him or her in an interview, it usually shows that a person who doesn’t know is willing to find out. That is a very important trait in the engineering world. Also use the interview as a chance to find out about your respective workplace.

DON’T LAY YOUR HEAD ON THE TABLE
Yep, it really happened and I have witnesses to prove it. This potential employee laid his head on the table several times during the interview. I couldn’t figure out whether he was tired or just listening for some type of table vibration that might indicate how well the interview was going. This would never be my only reason for not hiring someone. (I get some of my best ideas in that twilight between almost asleep and almost awake.) However, this was coupled with some other blatant problems. I just knew it wouldn’t work. Let’s just say this particular interviewee will have plenty of time to nap now.

DON’T CALL YOURSELF STUPID
I wouldn’t have believed it if it hadn’t happened to me. One applicant we had got a little flustered with a couple of basic questions, but that wasn’t what did him in. The first time he said “Man, I am stupid,” I didn’t think much of it; however, as the interview wore on, I heard, “Oh, I’m an idiot” and “I am soooo stupid” probably a dozen times or more. By the end of the interview, I was sure of one thing: I definitely didn’t want to hire an idiot, especially one so stupid.

A FINAL THOUGHT
There are a lot of guides out there on getting an interview and getting through an interview. They are even a bit more conventional than my seven don’ts. It can’t hurt to study up on some of these pointers. I also think it helps to know a bit about the company you are interviewing with. Take advantage of today’s ability to look up anything on the Internet. It will help you decide where you want to be, and it also doesn’t hurt to have a little background before going into an interview.

How to Keep a Job
When the ax falls, will you be the one to get chopped? How do you increase your stability in a given company? What makes an employer keep one person and let another go? Here are five key areas that can give you a little more security in this layoff-prone world—things you can do besides simply being good at your job.
VALUE
Here’s a Thumb Rule: *Companies exist to make money.* Even nonprofit companies need to bring in money to cover their salaries and expenses. When your employers start reviewing you and your coworkers, you need to realize that this is foremost in their mind.

This is the question the manager must ask himself: If I had to start all over with just one employee, who would it be? Or in other words, who would most likely make this company a success? In my analysis, this person is the “shooting star.” He or she works hard, has great talent, can handle pressure, and works well with others. If you ask him for something you get it. You don’t have to keep checking up on him. You know she is going places. He very directly affects the profitability of the company.

Therefore, you must remember that your total value is of top importance. What if you add value, though, and no one notices? This can happen, especially in larger companies. My answer is this: It is not bad to toot your own horn a bit. A good way to do this, both for you and your employer, is to do a regular self-evaluation. List the things you accomplished last year and compare them to what you did this year. Do you show improvement? If not, commit yourself until you do. Then give that to your boss. He’ll appreciate that you look at yourself critically and it’s a good chance for him to see what you have done for the company.

POSITION
Repeat the thumb rule we just learned: *Companies exist to make money.* They don’t do that without a product. So the most important job you can have is one that is directly related to the product. Don’t get stuck in a one-off job. What is a one-off job, you ask? A one-off job is one you can eliminate and still sell product. It is one level removed from delivering a product to the customer. The ISO 9000 “Corporate Coordinator” might sound like a pretty neat title, but when you get right down to it, the company could do without it. If you find yourself in a one-off job, it’s time to start looking for a transfer.

LOYALTY
It’s human nature to complain. Because of that, an easy yet subtle trap to fall into is right by the water cooler. In this trap you discuss the latest smack about the boss. Every leader I have ever met appreciates loyalty. If you succumb to spreading rumors, whether true or false, you put yourself on shaky ground. I
am not saying the pointy hairs don’t make mistakes. In fact, I believe that a manager only needs to be right 51% of the time to be successful, as you already know. So remember this: They might have their faults, but so do you. If you have a serious issue with your boss that you can’t overlook and can’t help talking about, you’d better start looking for a new job, because in today’s market, you soon will be.

**EFFORT**

Effort is important for two reasons. First, a great effort can compensate for a lack of skill. Remember that the guy who tinkers in the lab for hours on end can get to the finish line faster than the brilliant engineer who spent the morning surfing the ‘Net. It’s all about getting to the market the fastest these days. It is the entire reason that MAMA\(^{18}\) exists. All the pointy hairs want to do is to deliver product, make the sale—in general, to do business. So a supreme effort is usually noticed. Remember, the same rumor mill you should avoid yourself can have a tremendous effect on you. You can be known for hard work, or you can be known as a slacker. The choice is up to you.

**IF THE WORST HAPPENS**

It is possible that no matter what you do, you still get laid off. At times when a company has to cut deep, there is nothing that can be done. I suggest you take this as best you can and leave on a good note. If things pick up again, it is a lot easier for a boss to rehire someone he knows will do a good job rather than any Joe off the street. So don’t burn any bridges.

**A Final, Final Thought**

By no means do I consider this list comprehensive. There can definitely be more to it. People skills, attitude, and other things are considered by an employer when making this tough decision. To make it worse, the world is not all sugar and spice. There are sadistic pointy hairs out there who give the rest of us a bad name (I just hope they are the exception, not the rule). If you have one of those, don’t complain, just start looking.

Remember, dealing with people is not a very exact science. There is no Ohm’s Law for corporate culture. These are things that I have found that generally work. You can sum it all up by referring to the different types of employees we

\(^{18}\)Look it up in the appendix; I promise you will find some of the more entertaining parts of the book there.
HOW TO MAKE A GREAT PRODUCT

The Slinky, Legos, the PC, Silly Putty, weed eaters, Velcro, cell phones, DVDs, pet rocks, and the microwave—the list of killer products seems endless. How do you go about designing a great product? What makes a product successful? Believe you me, the list of great ideas that never went anywhere is much larger than the list of things that made it! For those of you with a more entrepreneurial spirit, here some pointers on how great products come into existence.

The Idea

Usually the core of a great product addresses a need or desire. The more people who share that need or desire, the more success potential an idea has. Here is a real live example. My car windows are always frosty during the winter here in Logan, Utah. I don’t have the patience to start my car early and wait for the defroster to clean the window, so I scrape. Scraping is not much fun, and last year I had a great idea for an invention. Why not put a heater in the windshield washer fluid so that I could have a quickly defrosted window without having to scrape? I am sure there are other people like me who would want this product.

Let’s evaluate this idea for a second: first, the buyer of such a product would need to own a car. That limits the primary market to Canada, the United States, and Europe. Then it has to get cold enough to frost your windows where you live. There goes half the United States. Next, to be like me, you can’t afford to
park your car in a garage, and that eliminates a bunch of people. I figure that Canadians like to scrape, knocking off another large part of the market. So will this idea make me a million? Probably not, but if I worked hard enough at it, it might generate a decent income for a while.

Compare that to the market of the weed eater (string trimmer, to be more correct). When George C. Ballas stuck some twine in an old tin can and spun it on his electric drill, he was addressing a need that many a man felt. Not only did it chop those pesky weeds, it involved a motor as well and, oh, the power rush!

His market was anyone who had ever wished for an easier way to trim those hard-to-reach places in his lawn. To top it off, it also stroked the male ego. I think it had a larger success potential than my defroster idea, don’t you? Notice that I said potential. A lot more than potential is needed to make a product a success.

**Design**

The product needs to work well. This means that the design needs to do what the customer expects from it. If everyone sends the product back, it won’t be a success for long. There is one all-too-evident exception to this rule: software! Sometimes people will deal with glaring product faults (also known as GPFs) if that is the only game in town. It is that or you really need a particular feature and are willing to deal with the bugs. It bothers me though that you can’t send it back because you clicked “I accept” on the 40-page EULA that no one reads, which prohibited you from even taking Bill’s name in vain, let alone returning a product. But . . . here I am using that same popular word-processing program because of the features I like.

It also needs to look good. Ever since the 1950s, industrial designers have convinced the consumer that you can have a functional product that looks good as well. There are successful ugly products out there, but if they looked good they would be even more successful. Have you ever said, “That’s a sweet little package,” in reference to something other than the opposite sex?

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19 Okay, I’m slamming on a certain large software company here. To be fair I will say that my more current versions of this software are significantly better than the versions I learned on many years ago. The best thing that ever happened to software was the ability to update it. Yes, they can lock out the hackers and pirates who believe that all IP should be free, but for me and most of the world it is nice to get a free update that fixes that pesky bug.

20 I still hate EULAs though. Software, unlike every other consumer product, carries no responsibility for any damage it may cause. Someday this may change, but it would likely drive the cost of software up and I’m a cheapskate, so I guess I’d better stop complaining.

21 Possibly a bad analogy, since I have heard an engineer say exactly those words in reference to an IC, but you get the point.
**Timing**

Ahhhh, timing ... it is as important in launching a product as it is in telling a joke. I don’t think the weed eater would have sold before America moved into the suburbs and the lawn wars began. The Slinky wouldn’t have made it very far if it came after the Nintendo. A company I worked for had an idea that changed our marketplace. It was featured on some 30 different news channels and became a raging success. It didn’t stick till the third time it was tried. The first two times were utter failures. It needed the Internet as a global community to be a success. The first two times it was tried, the global data community just wasn’t there to give it the buzz it needed. Timing is important.

**Funding**

It takes a million to make a million, right? This is usually the case unless you listen to late-night TV. Now, if you believe that stuff, I have a book on how to get a perfect stranger to give you 50 bucks. I will sell it to you for only $47.95 plus shipping and handling.

I think that funding is one of the things that stop more great products from coming into being than most other reasons combined. You have to take some type of financial risk. One way is the OPM method: use Other People’s Money. Unfortunately, it takes a smooth talker to get other people to part with their money, so you might have to run up your credit card or go deep into your savings. There are many ways to get the money, but it will cost money to get your idea to market. You will have to take some risk at some point to make it happen.

**Marketing**

You *have* to sell your product. No one will buy a product that isn’t sold. That takes marketing. ‘Nuff said.

Okay, maybe not. I used to think this was pretty obvious, but when I started a business helping people get stuff to market, I found that marketing is often the most ignored part of getting a business off the ground.

If you build a better mouse trap, the world will not pound a path to your door without an infomercial, a store, or a way to know it exists. You will need to be a salesman of some type to get your idea off the ground. If someone doesn’t buy it, you don’t have a product—just another idea that didn’t go anywhere. The patent libraries are full of mouse traps that you can’t buy anywhere.
Making a Great Product Summary

So, will you be the next Bill Gates? Just think of a product that everyone wants. Get a couple of rich relatives to put in a good word and pitch in a few bucks, and who knows. If your timing is right, it just might happen. If not, I still have that book for sale . . .

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<thead>
<tr>
<th>Thumb Rules</th>
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<tr>
<td>✅ Have a good idea (this is the easy part).</td>
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<tr>
<td>✅ Consider the market potential.</td>
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<tr>
<td>✅ Your product needs to work well.</td>
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<tr>
<td>✅ Looking good helps.</td>
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<tr>
<td>✅ Timing is everything.</td>
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<tr>
<td>✅ It won’t happen without risk.</td>
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<tr>
<td>✅ You need to sell it.</td>
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