CHAPTER 13

THE CORPORATE LADDER
CAREERS OPEN TO YOU

How high up the corporate ladder do you want to climb: to the middle or the very top? The first step to climbing the corporate ladder is to determine the steps in the ladder and where they lead to. Corporations have a hierarchical engineering ladder with a definition for every job level on the ladder. If you are not aware of the engineering hierarchy in your corporation, then meet with your supervisor or someone senior in the company and map it out. Another good place to learn about the engineering hierarchy is your Human Resources department. Oftentimes, companies will post this information on the company website. Make sure you check out all three sources since this hierarchy is often highly dynamic and usually changing on a yearly basis.

▶ ***Career Tip.*** To successfully climb the corporate ladder, first determine its structure and where the steps lead.

CAREER PATHS FOR ENGINEERS WITHIN A CORPORATION

A typical ladder structure for larger engineering corporations is shown in Figure 13-1. At the bottom are the nonsupervisory engineering levels. Most companies have between four and five levels of engineering before one reaches the staff or supervisory level. I have identified these levels as E1 through E5 in the figure.

In the lower levels (E1–E2) of engineering you are expected to be a good team player and learn from the senior engineers, who are considered the pros. Your assignments are often one or two days long and usually accomplished by yourself, or with the help of another person or mentor.

As you move up the engineering ranks, your responsibility greatly increases. In the middle levels (E3–E4) you start to lead small teams to

The Engineer's Career Guide. By John A. Hoschette

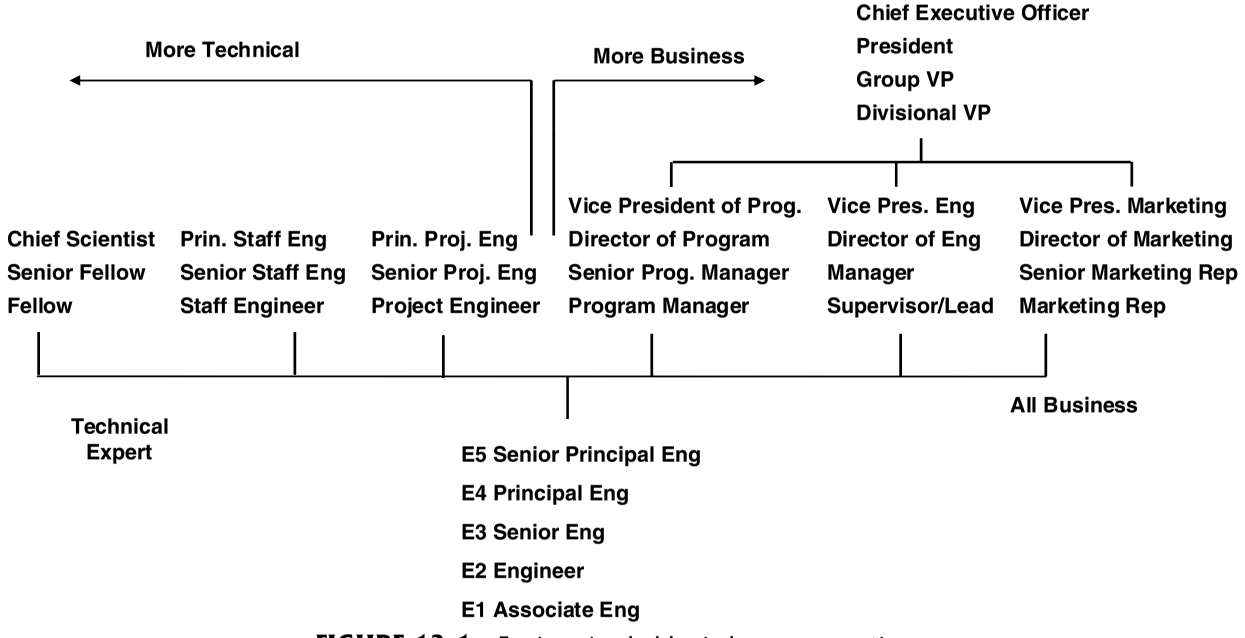

FIGURE 13-1 Engineering ladder in large corporations.

accomplish specific objectives. The objectives are usually well-defined. The teams are two to three people and assignments may extend over several weeks or months. You are primarily responsible for technical work. You slowly transition from being an individual contributor to team leader and guiding the work of others to accomplish your objectives.

In the upper levels (E4–E5) of engineering, you are responsible for directing large teams of engineers with various backgrounds. Often the objectives are not well-defined and it is up to you to plan things out. Besides giving the team technical direction you are also responsible for maintaining schedule and cost control. You must have good interpersonal skills to ensure work is being accomplished by other people rather than doing it yourself.

Once you have reached the staff level, several career choices are available. The typical choices are shown in Figure 13-1. The career ladder typically splits into five or six different paths. The engineer has the opportunity to pursue several different technical career paths and several different management career paths. They range from the very technical on the left to mostly business on the far right. The three technical ladders on the left are comprised of people who are not interested in becoming business leaders and are rewarded by finding new technology.

Staying technical means your career interests follow along the fellow and system engineering paths where your primary focus is technical advancement. Having a successful career does not only mean becoming president of a company. You can have a very successful career and remain technical. Your success is not necessarily measured in terms of titles, power, and profits. It is measured in terms of breakthroughs, papers published, patents, technical awards, and what is right for you.

ENGINEERING FELLOWS' LADDER

At the far left is the fellows' ladder, which is the most technically-oriented ladder. These people are usually PhDs who have dedicated a great deal of time to furthering science and technology. They are usually the research scientists of the company. To get these positions, they have spent their life focusing their career on solving technical issues. They are often recognized as technical experts in the company. One example might be if a company is building a car, they could be the expert in spark plugs, or another example might be the world's leading authority in tires. Fellows are typically recognized technical experts within the corporation and also known for their expertise throughout industry. Stereotypically they are thought of as having silver hair, a messy office with patents, plaques, and awards.

If your career aspirations are to remain purely technical then this ladder is for you. If you already have an advanced degree in engineering, then you have a good start. However, with the rapid pace of changing technology you

will have to return for updating in new technologies and make lifelong learning part of your career plans. If you do not have an advanced degree in engineering, then returning for a Master's or PhD should be in your career plans.

Usually fellows are most interested in the pure science of the problem. Fellows mainly deal with technical issues and avoid management or cost issues whenever possible. Learn who they are in your company. They are the best technical resources you have in the company. Fellows are the technical lifeblood of the company. Usually, they are easy to approach and often enjoy helping younger engineers work toward the best technical solutions. Their many years of experience, and typically large network of technical contacts, can be extremely valuable in helping you solve technical issues.

Engineering fellows have most likely seen nearly everything and they are very thorough with technical details. When interfacing with fellows, be very precise, pay attention to detail, and do not guess about the technical subject you are discussing. Make sure to double-check your numbers before presenting any data. You should think of fellows like your university professors—they want to see the technical details and analysis of your work. When you interface with technical fellows, make sure you show them your best technical work.

▶ ***Career Tip.*** Engineering fellows are the technical experts in the corporation. They make great coworkers to have as a friend when you encounter difficult technical issues.

Associating with fellows can accelerate your career or dead-end it quickly. If they like your work and believe in you, they can sponsor you to upper management. The senior fellows often help management assess who should be on the team and who should not. If your work is top notch and they like it, more than likely you will receive a favorable nod for the more technically challenging assignments. Correspondingly, if your work is sloppy and full of mistakes, they will quickly label you as technically inferior and not a good choice for leading technical assignments.

STAFF/SYSTEMS ENGINEER LADDER

The next ladder to the right in Figure 13-1 is the staff or systems engineering ladder. These people usually have a Master's degree and deal with putting systems together. The staff or systems engineers generally work on the big picture technical issues, such as the overall performance of the products. If, for example, the staff or systems engineer were building a car, he or she might work on the technical problems associated with the overall mileage

performance of a car. This may include multiple technical areas that need optimizing, such as aerodynamic shaping, motor efficiency, weight, and size. Their assignments require them to be technically proficient in multiple areas.

If your career aspirations are to remain technical but you like to work the "Big Picture" or overall system aspects, then this ladder is for you. If you already have an advanced degree in engineering, then you have a good start, but you will need to broaden your areas of technical knowledge. For instance, if you have an electrical degree, this will mean you should take more technical classes in mechanical, software, or chemical engineering, or other engineering disciplines your company considers critical to its survival. The value the staff engineer brings to the corporation is to be knowledgeable in multiple engineering fields and able to technically direct the work of engineers of all types of disciplines. With the large teams and diverse backgrounds of the team members these days, the staff engineer plays a vital role.

If you do not have an advanced degree, then returning for a Master's or PhD should be in your career plans. However, with the rapid pace of changing technology you will have to return for updating in new technologies and make lifelong learning part of your career plans.

Staff engineers, like fellows, concentrate mainly on technical issues. However, with their broad background they often also serve in advisory roles to management, on technical as well as schedule and cost issues, of the project. They are very analytical and usually responsible for the big picture on how things are coming together technically. You can usually recognize them by the fact that they typically have the best computers in the group and their office walls sport collections of flow charts and graphs showing trade studies.

Staff engineers primarily work to determine the best overall product configuration. They are primarily interested in the product requirements or specifications. When conflict arises or performance compromises have to be made, they are the ones doing the trade analysis and determining the optimum approach. They are highly analytical and often talk about product performance requirements, budgets, and performance margin. If you try to get an answer out of them, they will usually qualify it with the phrase "That depends upon."

▶ ***Career Tip.*** Staff/system engineers think in terms of the big picture, so make sure you understand the big picture when working with them.

Interfacing to staff or system engineers can also help accelerate or dead-end your career. System engineers analyze the big picture; they want to know what all the causes and effects are. If you have the opportunity to interface with system engineers make sure to present the big picture and how your part relates to the overall plan. Know your requirements forward and backward and exactly how your design is performing against requirements. If you go

into their office with only the small picture, they might quickly label you as not understanding the problem. Being labeled incompetent is exactly what you don't want your supervisor to hear. Having your supervisor hear from the system engineer about how you have a great understanding of the requirements, and how your design performance is superior, is exactly what you need for career advancement.

PROJECT ENGINEERING LADDER

The next ladder to the right in Figure 13-1 is the project engineering ladder. These people have an engineering background and generally possess an advanced degree. Project engineers deal primarily with running the technical aspect of projects. They are usually responsible for determining the project plan that defines the engineering tasks to be accomplished, generating a plan, assigning work, and tracking progress. They are responsible for ensuring the technical vitality of the project as well as ensuring that the staffing, budgets, and cost planning are met. They have responsibility for both technical and limited cost performance. Their primary focus is on organizing and executing the engineering tasks of the program, this requires them to have good solid background and knowledge in multiple engineering disciplines.

The project engineer supports the program manager in accomplishing the project goals. The project engineer must have business skills such as team leadership, project planning, financial budgeting, and a broad technical background. The project engineer must be able to define the work scope, plan the effort, establish engineering budgets, determine the master program plan, showing all tasks and track progress. When problems are encountered, the project engineer's role becomes coming up with a recovery plan. This may include getting special engineering talent assigned and organizing special teams.

If your career aspirations are to some day be the technical lead, then this ladder is for you. If you already have an advanced degree in engineering, then you have a good start. However, having an engineering degree is only the prerequisite for this ladder. You must also have some business training. The project engineer must have business skills and this is a new skill set for the engineer. The engineer should return for business training and even obtain a business degree. Some of the specific skills you will need are dealing with difficult people, team leadership, motivation, and project planning. You will be responsible for generating proposals and then executing the programs. If you do not have an advanced degree in business, then returning for a Master's degree should be in your career plans.

▶ ***Career Tip.*** Make sure you know what the project plan is, what your tasks are, and how you are doing against the plan when you interface with project engineers.

If you interface with project engineers, make sure you know what the project plan is, your tasks and how you are doing against the plan. They expect engineers to understand the critical tasks they need to accomplish, have a good technical approach, and be able to report how they are doing against the plan. They often provide feedback to the supervisors on engineer's performance, so let them see you at your best every time you interface with them.

PROGRAM MANAGER LADDER

The next ladder to the right in Figure 13-1 is the program manager ladder. These are people who typically run programs or projects and have an engineering degree or background. They are responsible for cost and schedule performance and have little to do with performing the actual technical work. They organize teams of engineers to accomplish the tasks on their programs and they are generally the primary interface to the customer. Program managers are easy to recognize because of the huge schedules hung up in their offices. The schedules usually show every task planned and the progress made.

The program managers control the funding for programs and have little to do with personnel and salary administration (raises). The program managers are focused on getting the job done on time at the cost they quoted. They are primarily responsible for organizing the team to build and ship products, so the company generates revenue and makes a profit to pay salaries.

If your career aspirations are to someday control the program financials and deal directly with customers then this ladder is for you. The program manager must have business skills that may be a new skill set for the engineer. This means the engineer must return for business training and even obtain a business degree. Many universities recognize this fact and now offer a Master of Business Administration degree program specifically geared toward the returning engineer. If you do not have an advanced degree in business, then returning for a Master's degree should be in your career plans.

Program managers play the vital role of organizing the team, determining the tasks to be worked, and establishing a budget and plan to accomplish their goals. Program managers not only work with engineering, they also work with nontechnical departments in the company. Program managers direct the work of personnel from such departments as contracts, finance, legal, and marketing. In this capacity, they must have a broad business background and understand the financial as well as legal implications of the companies' work.

▶ ***Career Tip.*** Program managers are primarily interested in getting the job done right, on time, and within cost.

Program managers expect you, as the engineer, to understand your assignment and have the technical knowledge to complete it on schedule.

They expect you to be able to discuss your progress against the plan, control spending, and present alternative ways to meet the development schedule. If you run into roadblocks or technical difficulties, program managers are not interested in excuses. Their bottom line is getting the job done. You may find they can be abrasive at times, because their main focus is the job (work to be done). They can do a lot to help you get a promotion or prevent it. Your supervisor is normally required to obtain feedback on your performance from the program manager on your projects. What kind of feedback would you expect the program manager on your project to provide your supervisor? Have you considered this? You can be doing a great technical job, but if you are far behind schedule and causing cost overruns, this is not the type of work a program manager wants on their project. Balancing technical work with cost and schedule consideration is a primary concern of the program manager; please remember this the next time you interface with a program manager.

MANAGEMENT LADDER

Engineering managers are responsible for personnel and profits and usually possess a technical background. The management ladder is not only responsible for profits but they also control hiring, raises, promotions, and demotions. Managers typically do not deal in the day-to-day technical work, but generally rely on their technical staff for this. They focus their time and energy on making sure the company has the appropriate staff, work to resolve personnel-related issues, help staff and de-staff teams, and help the engineers in career development.

The engineering manager also plays a vital role in the company of handling the everyday issues of simply running the business and remaining profitable. It is this ladder that determines the products to be worked on, the people to be assigned to projects, which products and projects are continued, and which are stopped. The managers must handle all the salary administration of the company, ensure policies and procedures are being followed, and provide rating and ranking of the engineer's performance. They must have great people skills that allow them to tactfully resolve people problems in the best interest of the company and the employee, and they often work with the Human Resources department to accomplish this.

If your career aspirations are to become an engineering manager some day, then this ladder is for you. If you already have an advanced degree in engineering you have a good start. The engineering manager must have the people and business skills and this is an entirely new skill set for the engineer. The engineering managers spend most of their time helping engineers with their career and staffing program. Their primary job is to provide the best engineering personnel they can for a program. In addition, they are responsible for conducting performance reviews and handling the administrative tasks of the company like training, benefits, vacations, and salaries.

This is the ladder your supervisor may be in. Their primary concern is that you are a contributing member of the organization, you are performing your job tasks as needed and accomplishing them in a timely manner, you are providing sound technical solutions to problems, and you are growing in technical knowledge and background. They are concerned about your ability to successfully interface with other team members and senior members of the organization.

They deal mostly in making sure the company is getting the best human resources possible and people are performing their jobs. They control people, salaries, and costs. They often function like coaches for the organization. They assemble teams, make the work assignments, and help motivate the team. They often do all the hiring and employee performance appraisals. Supervisors are responsible for ensuring the policies and procedures of the company are followed.

In addition, they have to deal with the unpleasant side of the people problems, namely poor work performance, legal issues, and even potential lawsuits. These are all new skills the engineer must acquire if hoping to become a manager some day. If your career aspirations are to some day become an engineering manager, then I highly recommend you read the literature and books dedicated to transforming an engineer into a manager.

MARKETING OR BUSINESS DEVELOPMENT LADDER

The career ladder furthest to the right is the marketing or business development ladder. This ladder is responsible for developing new business through marketing of the products. They often have an engineering degree as well as advanced training in business marketing. Their primary function for the company is to sell products and help with the customer interfacing. Generally, this type of position draws upon a technical engineering background since many of the products today are quite complex and highly technical in nature. Marketing people spend the majority of their time traveling and meeting with customers. They are the company's lifeline to the customer. They work on order forecasting, predicting market trends, and public relations for the company. They require a special skill set on how to sell and market products and work through customer problems with engineering to get quick resolution.

If your career aspirations are to become a marketing manager someday, then this ladder is for you. If you already have a degree in engineering, then you have a good start. However, having an engineering degree is usually only the prerequisite for this ladder. The marketing manager must have the people and business skills and this is an entirely new skill set for the engineer. The engineer must return for business training and even obtain a marketing degree. If you do not have an advanced degree in marketing or business, then returning for a Master's degree should be in your career plans.

Career Ladders Leading To Executive Levels

The corporate engineering ladders are discussed first to let you know they exist, to make sure you are aware of it, and to get you thinking about your career path. Second, as your career develops and you move up the ranks, you will have to decide which ladder fits your plans, whether you want to be technically or business-oriented. As you move up you will need additional education and training. You can shorten the time it takes to move up the ladder by getting the appropriate training before you advance. If you like technical work, you should prepare yourself by taking more technical training as you grow. If you desire a more management-oriented career, then you should take more business training. There is no right or wrong career path. There is only what is right for you.

As shown in Figure 13-1, the right three career ladders of Program Management, Engineering Management, and Marketing generally lead to the top positions of the corporation. Oftentimes, to become CEO of a corporation, you must have spent time in at least two of the three business ladders. This is often one of the key selection criteria required since you need experience in multiple facets of the business to successfully run the corporation. For this reason, most executives will have worked on several different career ladders before they make it to the top. Therefore, taking assignments in different career ladders can be a very good career move. In many corporations, it is the program management ladder that most often leads to the vice presidential level.

Many engineers aspire to become managers and are willing to take the training required to successfully carry out the assignments. However, a fair portion of these engineers leave the management ranks after they discover they are not cut out for this position. So before you take the leap into management, meet with your mentors and other senior level people to find out all that is involved in being a manager.

Many engineers go into management with the hopes of quickly climbing the corporate ladder to become CEO. To this thought, I would like to point out a piece of hard evidence to the contrary. The CEO of a major corporation is 1 in 100,000 employees. That means your odds are approximately 1 in 100,000. And the changing of the CEO only occurs about once every five years. To put it bluntly, these are not very good odds and if you check some state lotteries, you have more of a chance of winning the lottery than you do of becoming CEO. However, I do not want to discourage you. All I want for you to realize is that without a good career plan, any advancement is highly unlikely and if you aspire to become CEO, you should have a great career plan.

Moving Up the Ladder Means More Responsibility

As you move up the ladder, each level becomes more demanding. You must decide for yourself what level is right for you. If you have a family and that is important to you, you must decide if becoming Vice President is right for you.

Usually, to become Vice President the family experiences many compromises. Some people stop at the lower levels, others at the middle levels. For these people, this is comfortable and a good choice. You have to decide what is good for you. How high you decide to climb on the corporate ladder is strictly a personal decision everyone must make for themselves. Beware the higher you go the more responsibility you accept.

▶ ***Career Tip.*** The higher you go up the ladder, the more responsibility you accept.

The bottom line here is that you need to define what success is for you. If it is getting to level E3 and you make it, then this is success for you. If becoming a supervisor is what you aspire to and you make it, then this is success for you. Success for you may not be measured in terms of titles, raises, or promotions; it may be as simple as doing the best job you can. Not everyone can become president of the company, nor do they want to. However, everyone should reach their own definition of success.

Now that you have had time to review and understand all the levels, which do you think is the best one? Many male engineers quickly respond "CEO, he is on the top." When I asked the women engineers they mostly respond, "The one you are most happy with!" If you are at that level where you thoroughly enjoy the work, then don't beat yourself up because you are not the CEO, and enjoy the position you presently have.

▶ ***Career Tip.*** The best position on the corporate ladder is the one that makes you most fulfilled and happy.

If you are unhappy at the level you are at, your work will show it. Make a change and move to the level you are happy with. This could mean moving up as well as down or even lateral.

There is another very difficult position for most engineers. It is the first-line supervisor. Everything in the company comes together at this level. All the great ideas generated by the president of the company on how to run things, must be implemented by the first-line supervisor. All the policies geared to running the company must be enforced by the first-line supervisor: vacations, health care, drug testing, expense reports, employee training, security, raises and promotions, project successes and failures, personnel problems, and department budgeting to name just a few.

▶ ***Career Tip.*** One of the toughest positions on the ladder is the first-line supervisor. Remember that when you are talking with them.

Put simply, all the direction from management above falls on them, and all the headaches from employees below rise up to meet them. They are the single

point in the company where everything comes together. They are required to do everything and most often it all has to be done now. They are usually overloaded with work.

Take it easy on your supervisor. They're trying to do the best job they can, so give them a break. Often, first-level supervisors quit and return to the technical ladder rather than continuing on the management ladder, because it is a very demanding level. Learning to deal with the stress and handle multiple priorities at once is key to career advancement at this level. The first-line supervisor is like a filter function in math. Those engineers who do not develop great time management skills and people skills are quickly filtered out of the management ranks.

Make your supervisor your friend, not your enemy. The last thing they need is you running into their office every time something goes wrong. Remember, when you go in to talk to your supervisor, he or she probably has a thousand things on their mind.

Let me make several interesting observations about the engineering ladder structure. Between the lowest level and the top there can be as many as 14 1evels. Not all organizations have this many 1evels in the corporate structure. In any case, let's look at how long it would take you to get to the top if there were 12 levels. If you could get a promotion every 3 years (and this is considered very fast rising), it would take you 36 years. Therefore, you had better make every one count.

▶ ***Career Tip.*** Only with great career planning is advancement possible, and if you aspire to become CEO you need a career plan that yields promotions every 3 years.

An easier way is to know someone at the top and have them help you rise to the top. This is called sponsorship and believe me, it happens. The alternative to coping with all this structure would be to start your own company, but that's another story for another book.

SUMMARY

The corporate ladder has many steps and multiple paths. Some ladders lead to purely technical careers where rewards are in terms of technology breakthroughs, patents, and publishing papers. The other ladders lead to business careers where the rewards are in terms of management positions, profits, and people management. The key to being successful is knowing the different ladder paths and which ones you are best-suited for. In addition, all paths to the upper levels require significantly more training and greatly expanding one's skill base. As a result, lifelong learning should be part of your career plan.

Have you identified any career actions you want to take as a result of reading this chapter? If so, please make sure to capture these ideas before you forget by recording them in the notes section at the back of the book.

ASSIGNMENTS AND DISCUSSION TOPICS

1. The first homework assignment you must complete is to map out the engineering ladder in your company. A good place to start is with your boss. Inquire about the levels within the company; next ask to see the organization chart and where you fit in. Another good place to check is the company website. How about your program manager on the project you work on? Does he or she have an organization chart?
2. If you can, obtain a description for each of the levels. Usually, every company at one time or another has written job descriptions for each level. It is interesting to compare the descriptions as you move up the ladder. If you do not understand the descriptions, a good place to get clarification is your supervisor or Human Resources department.
3. Obtain a copy of the job descriptions for your level and the next level up. First study the description for your current level and see how you compare to it. Remember, if you want to get promoted, make sure you are fulfilling every requirement. Next, study the level above yours and see how the levels compare.
4. The final homework assignment is to determine what your career path will be. How high up the ladder do you want to go and how much time will it take? What actions must you take to reach your goal?