Transitioning from STUDENT TO ENGINEER

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BACKGROUND

"It is a great profession. There is the satisfaction of watching a figment of the imagination emerge through the aid of science to a plan on paper. Then, it moves to realization in stone, or metal, or energy. Then, it brings jobs and homes to men. Then, it elevates the standards of living and adds to the comforts of life. That is the engineer’s high privilege.”

~Herbert Hoover (U.S. President)

The genesis of this book is certainly interesting. In 2016, IEEE-USA E-BOOKS graciously published my work, *Tips for Young Engineers*, a compendium for helping young working engineers grow and gain perspective. Previously, in 2015, IEEE-USA E-BOOKS published my two-volume series *Staying Sharp*, also meant to help working engineers maintain a sharp edge. Both works are available at very modest cost from the IEEE-USA Shop at https://ieeeusa.org/shop/. I am most proud to reveal *Staying Sharp* won acclaim in several publishing award competitions.

After a recent, three-year assignment on my alma mater’s engineering school advisory board, it became evident that soon-to-be-graduating engineering students needed to be more aware of the world that awaits them. Engineering is so much more than simply mastering technical materials. That is what led to this new e-book—and taking a look at the soft/professional skills many young engineers tend to discount—often at their naive peril.

Within, I dispense experience and insights from the perspective of a more than 40-year career in engineering. This e-book is packed with tips and pointers for students and young professionals about the world of work, tempered with decades of experience in various IEEE assignments and professional activities. I hope it helps you to ease the transition from the world of books and courses to the globally competitive work-a-day world. Many people (often fellow IEEE members) helped me make this transition. I hope I can pass along that help and wisdom to my readers.

~Harry Roman
IEEE Life Senior Member
INTRODUCTION

"I don’t spend my time pontificating about high-concept things; I spend my time solving engineering and manufacturing problems.”

~Elon Musk

It’s time for a transition…your own personal transition…to professionalism. Fasten your seat belt; the changes come at light speed. The globally competitive world waiting for you can be unforgiving; it’s best to prepare for the radical changes coming your way. Remember how you felt when you started college, unsure of what awaited you, and how you would figure it out? The world of work is similar when you first dive into it. It’s often “baptism by fire,” and it lasts for 40-50 years. In the long run, it’s all about process skills.

It’s no longer just about writing that killer resumé, and crushing your interview. Those tasks just allow you to “board the train.” The particular car you choose to sit in on your career train is an entirely different affair; a much more intense experience. In fact, it is a career-long journey that begins the moment you receive word you are hired. Hopefully, you have been thinking about more than just your resume/interview already, because it’s all quite serious stuff. Let’s start with a statistic that seasoned engineers know viscerally:

“Over time, 15 percent of your job requires technical skills, while 85 percent requires professional or people skills.”

How does that grab you? For the past four to five years, you have been totally immersed in technical subject matter, probably barely tolerating a humanities course interlude here and there; perhaps wondering why you even have to bother with that stuff. Well, on the job, the humanities (in the form of professional, people and soft skills) reign supreme. Surprised?

In more than 40 years of engineering, I have never witnessed an incompetent engineer being fired; but I have seen engineering careers go terribly off-track, because those engineers had poor professional skills. Most often, I saw that poor written and oral communication skills caused many of these engineering careers to go awry.

To give this conversation perspective, here is a list of common professional skills that you must soon learn to master in the workplace. Most certainly, your employer will evaluate you annually on such skills This list is not exhaustive, but it is representative of the professional employment world:
• Communication, oral and written

• Leadership

• Management

• Team building / team participation

• Project management

• Creativity and innovation

• Entrepreneurship

• Coaching and counseling

• Interviewing

• Continuing education

• Professional growth

These foundational skills will enable you to aspire to, and ultimately advance within your company, or in other positions. Once mastered, professional/soft skills never obsolesce, and are always relevant to the modern workplace.

Engineering is more than being mathematically proficient and technologically creative. Ultimately, it is about people doing great things in service to other people and society—something no mathematical expression can quite capture. In my experience, the greatest skills in my personal repertoire are:

• Knowing the difference between when to be a leader and when to be a manager

• Oral and written communication skills

• Building project teams

Because I was a research project manager, being able to build really great interdisciplinary teams and manage projects were skills absolutely essential to my career survival. I also made sure to take continuing education courses/seminars/related activities each and every year, so I could remain vibrant and valuable to my employer, and to my own future career potential.