

Finding a Successful Career in Engineering Part 1



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Finding a Successful Career in Engineering

Part 1

element14 is a Community of over 700,000 makers, professional engineers, electronics enthusiasts, and everyone in between. Since our beginnings in 2009, we have provided a place to discuss electronics, get help with your designs and projects, show off your skills by building a new prototype, and much more. We also offer online learning courses such as our Essentials series, video tutorials from element14 presents, and electronics competitions with our Design Challenges.

This eBook is the first in a two-part series on getting started in your engineering career. We will discuss landing a job, what a typical work day looks like, inside information on what roles various companies are hiring for, and more.

You'll get insights and advice from engineers at 3M, Molex, Kemet, Keysight, and Tektronix. You'll hear from those who are just getting started, as well as those who have worked their way up to senior roles. Find out what you need to land a job from people with decades of combined experience, and stay tuned for part two in this series!

element14 Community Team





CHAPTER 1

How Did You Land Your Job?

Engineering is an exciting career path, one which allows you to develop your creative thinking and problem solving abilities, while making an impact on the world. Engineers often work in teams to tackle complex challenges that can't be solved alone, and that's just scratching the surface. As an engineer, your skills are highly coveted, so you have options. What makes sense to you today, may not be clear tomorrow. What's the right fit for you at this moment? When's the right time to consider a different role? We'll attempt to find answers to these, and many other questions, from engineers in various roles and stages of their careers.

Axel Schmidt has over 28 years of experience in the passive components industry. He started out as an Account Manager, and worked his way up to being a Senior Field Engineer, and finally then to a Senior Technical Manager. But how did he get started with TE Connectivity? He attributes it to a combination of luck, along with an excellent network.

"I was working for TE, and then there was some downturn in 2001, so there was a big layoff of people and I was one of them.

I would recommend surfing your network, and then you will always find opportunity. Anything in the passives world is like a big family."

- Axel Schmidt
Senior Technical Marketing Manager, Kemet

Patrick Geisler joined Keysight as a remote technical engineer in early 2018, after graduating with an MS in Electrical Engineering. He's currently a Distribution Field Engineer. He knew after graduation that he didn't want to follow in the same footsteps as his peers; for him, he needed to find the right fit based on his personality.

"I had different interviews and also offers next to Keysight, and I ultimately selected Keysight because I found it the most suitable and fitting company, giving me what I wanted to have. It was really what I wanted to see from the first company I joined. I finished my studies in electrical engineering and decided to move on into a sales position, so not following the education or the engineering path."

- Patrick Geisler
Distribution Field Engineer, Keysight Technology

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They told me that I didn't need any more math, I went what, I love math, I can't stand not doing math!

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Terry Collier has worked at 3M for 18 years, in a number of roles, and currently leads the Application Engineering Team in the Electrical Markets Division.

“I've had the opportunity to work in renewable energy, I've had the opportunity at working on films for displays, I've had the opportunity to work in our advertising, figuring out what's going to get visual attention. So it's quite incredible to get to work in so many different spaces. That's what's been really exciting.

My background is biomedical engineering and polymer science, and I also have a business degree. And it's great that I get to work with the team to innovate and to introduce new products.”

- Terry Collier
Application Level Engineer, 3M

Conor McGoldrick has been working as an Associate Sales Engineer for Molex for less than a year. He began

interning there while he was pursuing a degree in Electrical Engineering.

“They allowed me a lot of flexibility to move from an engineering-heavy role into product management, and now into sales.”

- Conor McGoldrick
Associate Sales Engineer, Molex

Jessica Dunn has been a Mechanical Design Engineer at Tektronix for the past 15 years. In college, she started out in a pre-veterinarian program, but switched out of it when she learned that she wouldn't be able to take any more math classes. At Tektronix, she started a Women in Technology group with her co-worker Selu Gupta.

“When I was in college, and they told me that I didn't need any more math, I went what, I love math, I can't stand not doing math! So I switched to mechanical engineering. I always like taking things apart.

I remember the interview process at Tektronix, and it was awful. It was a full day process, and there were these twenty men. And every time I got interviewed, it was by a man. At that time, there were no women mechanical engineers at Tektronix, in the design group. And so it was like, do I want to do this?

Well, I mean, the group was wonderful. And a lot of them have this amazing knowledge, so I felt that this was where I wanted to work. I mean, I could learn a ton from this guy or that guy. But it's challenging that there aren't a lot of women in mechanical engineering.”

- Jessica Dunn
Mechanical Design Engineer, Tektronix

Selu Gupta started the Women in Technology group at Tektronix with Jessica. She's a Senior Hardware Design Engineer. She describes her journey to get there as similar to Jessica's, only worse.

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“My situation was even worse. I was the only female in my class all through my Bachelors program, and through my Masters program as well. The only female, and like Jessica said, every professor knows your name and the whole college of engineering because you’re that one. You know, the unicorn, as they say, because there’s nobody else. On top of that, I went to school at the University of Idaho, where there weren’t many people who looked like me, either. So that’s just kind of added to a little bit of the pressure. But it also

fueled me to really show what I could do. I interviewed for this hardware electrical engineering position. And, yeah, all the people who interviewed me were men. And my team has been all men. And which is why creating this women and technology group was so important for us.”

- **Selu Gupta**

Senior Hardware Design Engineer, Tektronix



My situation was even worse. I was the only female in my class all through my Bachelors program, and through my Masters program as well.



Julie Campbell has over 30 years of experience as an engineer working in the Test & Measurement industry. She’s worked two separate stints at Tektronix, where she’s currently a Principal Mechanical Engineer. She was 12 years old when she decided to become an engineer, inspired by her father’s work and a love of math.

“When I was a kid, I was about 12 when I decided to become an engineer. I loved math. My dad worked on the Grand Coulee Dam up on the Columbia river, installing the third powerhouse generator system. And so, for about six years of my life, I was going on-site with my dad and saying, ‘This is so awesome!’

Architect. I am also leading our research and new technology efforts.”

- **Julie Campbell**

Principal Mechanical Engineer, Tektronix

I will say that there is always a period of time when you are proving yourself. I guess it should be that way, no matter who you are or what your background is. There is a window. People were very positive, but there was still a window where I needed to get my work done. I needed to step up, solve problems. And I needed to follow through.

I have been in Test and Measurement for nearly 30 years. I did two internships with Tektronix in college, and started as an NPI and production engineer. I think that taught me the most about good design work. I was with Tek for 10 years, and then with a competitor for 14 years. They were good, but I am back with Tek now. Both companies do things completely differently, which was a really interesting experience. I am a Principal Engineer and am now working as a System

“ Given the huge developments in technology ... engineers will be in high demand over the coming decades, and they currently have one of the lowest unemployment rates in any of the major sectors. ”

- newengineer.com

CHAPTER 2 What Is Your Typical Day?

Jessica walks through what a typical day looks like for a mechanical engineer working at Tektronix.

“So it depends on what part of the program you’re in. We typically have mechanical engineers design the product in CAD. So you’re on the computer a lot. You know, heavy computer work at the beginning. And then once you have parts and the built stuff, then it’s a lot of testing. So making sure things fit together, figuring out how they don’t. I’m working with vendors. I’m getting parts, tooling, that kind of thing, and then testing the finished product and making sure it stands up to Tektronix quality standards. So, in a typical day, there’s a lot of computer work.

But then other parts of the program, you’re working with a lot of other people and collaborating.”

- Jessica

“According to LinkedIn, more than half of the top 15 emerging jobs in the United States are tied to engineering to some degree.”

- Boston Herald



Julie’s days used to be a lot like Jessica’s, but she’s since shifted from being a Mechanical Engineer into a leadership role.

“My role has shifted more to where I’m part of our architecture team. So my job is about advanced technology. And I do a lot of communicating with a lot of different people. My job also entails debugging. So, for

instance, if you have a product that has an issue in a serious lying down situation, where it takes some combination of mechanical and RF review to resolve the issue, that falls on me. So that sometimes is a little bit stressful, because you can’t ship something because we found a problem.

The other part of my job is now some product development, but

I’m supposed to be teaching and mentoring other engineers to do the harder tasks, and to do more advanced equipment and more advanced tests.

So in my role now, I spend a lot of time in meetings and doing presentation work, and gone are the days of having large blocks of time to spend on what is product and designing things. I have very



tight windows to finish and complete tasks. I have to think smart about how to get work done even faster.

The other thing I'm probably more involved with now is helping to develop processes for other engineers, to introduce their ideas and to bring their ideas to reality. So I have a lot less quiet time. I kind of miss my quiet time at my desk, I don't have much of that anymore. But the rest of it is pretty interesting, because I get to see that people are very creative, and I really like looking at their ideas and helping them try and flesh those out.

I looked at my stats, and it's interesting. I have 90 people I collaborate with in a month on 6 different projects or activities. I am challenged to communicate with many different people with different technical or leadership roles, and I'm now trying to understand all sorts of concepts that aren't part of my discipline."

- Julie

Terry describes every day as being different. He says his best time is spent talking to customers about a product.

"This is what I love, that every day is different, but we have a range of roles. We may be working with

customers at their site, we may have customers here in Austin with us for training, we may be testing and adjusting products in our laboratory, someday we create or edit content—writing a report on performance, updating instructions and or documentation. Some days are presenting content. My best time is working with customers on a new product, to understand how it helps them, or integrating a new product into a customer's process."

- Terry

Selu typically can be found working on circuit design, simulation, and quick prototyping during the early stages of the product. This is usually followed by circuit board design, schematics, and then PCB layout.

"As an electrical design engineer, one can be working on circuit design, simulation, and quick prototyping during early stages of the project. That is usually followed by the phase of circuit board design and schematics, and then PCB layout. When the boards come back, a lot of time is spent on test, debug, design and spec verification, and integrating with software and firmware. We then go through cycles of manufacturing builds, before releasing the product."

- Selu

“

Tech roles inevitably evolve over time, so one attribute I'm always looking for as an employer is learning agility. We want people who not only can learn and evolve, but who actively want to.

- Dennis Grinberg, Eaton ('How to Engineer Your IoT Career' eBook)

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A typical day for Conor is spent answering technical questions and proposing design solutions. He works closely with engineering and product management to understand the process of developing new products and how they solve problems for customers.

"I'm often in a dynamic environment, working closely with my direct ASE team and our customers to help answer technical questions and propose design solutions.

We also work with our engineering and product management teams to

understand the range of processes involved in the development of new products, and how they work with customers to solve their problems."

- **Conor**

CHAPTER 3

Who Gets Hired?



When Axel is hiring, he looks for people willing to do the stuff that you can't teach. The positions he is looking to fill aren't for those who want fixed 9-5 schedules.

"I'm looking for computer application engineers, for technically oriented people who are also in the field. And I think the challenge is, it's not always the same working day job, from 9 to 5. It's looking for people who are highly flexible, willing to travel, and they're really open-minded and enjoy talking to customers. And you need to like to do that, which is something that we can't really teach people."

- **Axel**

Terry looks for people who are capable, but also willing to experiment. For Terry, finding the right people to develop is part of the search.

"We've got a global team, and we are ultimately looking for people who are comfortable with ambiguity and solving problems. We work in a culture that is very experimental, where you want to try something and quickly prove that it will work. Or, if it fails, then you move on to the next iteration, and continue to find that right solution, so we can test and validate it."

- **Terry**

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According to Julie, there are roles for analysts, general-purpose engineers, and software program managers at Tektronix. One thing that is important at Tek is that you communicate well and adapt.

“It kind of depends on the role that we’re interviewing for. But I think one of the things that is important for us is people who can communicate well and adapt.

So whether you’re an analyst, we have positions for analysts. We have positions for general-purpose engineering. I think right now we’re hiring for the software program managers.

So our program managers are typically engineers who are very good at understanding and boiling problems down to the root, and helping the team collect their thoughts. So being good communicators, to craft and understand things that are

outside of your discipline, I think is valuable at Tek. But I think the biggest thing we’re looking for now is being able to adapt and move fast.”

- **Julie**

According to Jessica, there is always a need for people who are adaptable and willing to learn in whatever role they occupy. In an electronics company, you can’t silo your expertise, she says.

“It’s really role to role. Sometimes we are looking for a system architect. In that case, we are looking for somebody who has a lot of experience with a certain system design, or has really good experience with designing FPGAs for bigger system solutions.

So some of those positions are very specialized, and we are looking for a lot of experience. But even in those situations, given the nature of the products that we

design, we definitely need people who are adaptable and are willing to learn. You can’t just stay in your little silo of expertise. You need to interact with so many different engineers just to get your own job done, because everything is so integrated. And we’ve got electrical engineering hardware, we’ve got software, we’ve got mechanical engineering with that test manufacturing.

And every engineer at Tektronix is usually interacting with two to three of those functions at various stages in their project to get it done. So adaptability and flexibility, and obviously the willingness to learn is very, very important, because without that, you can’t really be doing your job.”

- **Jessica**

“ *It is customary to know the name and job title of the people who will be interviewing you. If you view their LinkedIn page they will likely know you did so, but it's not a big deal! It comes across as being thorough.* **”**

- **Shabaz Yousaf**
element14 Top Member



CHAPTER 4

How Do You Build A Network?

In order to deal with the challenge of balancing a career as an engineer and a personal life as a mother, Jessica formed the Women in Technology group at Tektronix with her colleague Selu.

“It’s been an amazing career, learning from a lot of great people, and everyone’s been very supportive, but then eventually you become a mom. And balancing your career as an engineer and a mother has been a challenge, for me.

And so we created the Women in Technology Group, to form a community where we could collaborate and form a support structure for a vast number of people, including moms at Tektronix.”

- **Jessica**

The Women in Technology group started as a way to connect female engineers, and the mission became to create an inclusive and diverse environment.

“Everybody is welcome to be a part of the Women in Technology group. Our mission is basically to create this very inclusive and diverse environment at the company where we have a network, we have a community, and this opportunity to collaborate with everybody to create awesome products.”

- **Selu**

Julie finds time to attend Women in Technology meetings even with her busy schedule. As a leader, she felt she should help support and promote the group, as she followed all the cool things they were doing.

“When I go to the meetings and I listen to the different people talk about their experiences, people really open up, and talk about what excites them about technology

and engineering, and participating in projects around technology, because it’s not just women engineers.

We have a lot of men come out. They think our topics are interesting.”

- **Julie**

Terry suggests getting involved with industry consortiums, technical publications, and solving industry problems as a way to build a network.

“Many of us know each other through work in the industries, we work in the same space, and technology areas. So, as you can see, being involved in industry consortiums, being involved in technical publications, being involved in solving industry problems, you end up meeting a lot of people.”

- **Terry**

Axel suggests starting with communities, as well as trade shows & symposiums.

“I think networking, starts mostly in the communities, as well as in trade shows and symposiums. So you go to a couple of events, then you hook up with the same people later, and at a certain point people will come to you, and ask you something.”

- **Axel**

Patrick didn’t start networking until he landed his first job.

“Networking didn’t start off before getting the job for me, but it started right away when I began the job. My networking really began the first day at Keysight. Connecting to the team, seeing who knows what, because you cannot know everything.”

- **Patrick**

Conor suggests you start networking when you are still in school. He also recommends connecting with alumni and attending career webinars.

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“I’d say it’s very important to have a good relationship with professors in the university. I had a very good relationship with my thesis supervisor, he had a lot of connections with a lot of different large companies. I think for others in university as well, it’s very important to stay connected with your alumni.”

- *Conor*

CHAPTER 5 Is It Ever Too Late to Begin Again?

According to Axel, it has less to do with ability, and more about the willingness of the company to hire you after a certain point.

“I’m 56 now, and if I decided to go into a completely different business area, I would say probably it’s too late. But if you’re in your 20s, 30s, even the beginning of your 40s, I would say it’s easy and it happens to begin a career again. The other question is if the company is willing to hire you at a certain age, at a certain salary expectation. But that’s definitely a different story.”

- *Axel*

For Terry, it’s never too late.

“I don’t think so. I think there’s always going to be a learning curve, but as engineers our job is always learning and applying it to new problems. Most of the recent Nobel Prize winners have been people who studied one area and were then working in another. The challenge that people experience, whether they’re 20 or they’re 50: can you learn the fundamentals, and then start applying them?”

- *Terry*



Watch the [Engineering Career](#) and [BadassWomen Engineer Career](#) Virtual Panel. Learn more about the engineering field on the [Business of Engineering](#) page. And don’t forget to download [the second part of the careers eBook](#) in this series.



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