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Writing a Hot Resume for Today's Job Market

A Tale of Two Engineers

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A doctoral candidate named Mike walked into my office the other day. I asked him what field he was researching for his degree. He told me he was working in metal stamping, and that he liked it a lot. I asked him how he could do that without the benefit of having a tool-room, materials, or even a stamping machine available to use to learn and experiment. He told me that he was using computer software to simulate all of that, and that he didn't think he needed those things.

At that point, I told him that I would be surprised if he would be hired as a manufacturing engineer today without shop-floor experience. He countered that he knew of many PhD's who have been hired at high levels without plant experience, and he was confident he could get a job. Point for him! (Sadly, I know of many also, but that is the topic for another article.)

I told him the story of a friend and mentor of mine, Will, with whom I worked at Fisher Body when I got out of school. Will had come up through GM's apprentice program and finally ended up as a superintendent of a GM stamping plant. Over his career, Will had seen it all, done it all in stamping (and about everything else—in a great career). When he retired, he thought he was out of manufacturing, moved to Florida, and took up a new career day-trading stocks and drinking martinis on the beach. After a couple of

months, Toyota started calling him for help with a stamping problem. He kept declining. Finally, he decided he would make some unreasonable demands to come to Japan, and they would give up. Instead, Toyota agreed to pay mid-six figures, and supply limos, chartered planes, and the like to fly Will and his wife to Japan. Two weeks later, he found himself in a conference room looking at a stamping with a pucker (shows you Toyota's relentless drive to perfection here). He advised a modification to some binder clips (the part that held the blank down). Eighteen minutes later he was walking out of the plant—problem solved and much richer. The point is that the “theory of stamping” was inadequate to replace the “technology and experience of stamping.”

Mike understood the message and is trying to figure out how to get some hands-on experience.

The point of this article is to provide advice, from an academic perspective, about things to do to further your career. It is widely known that manufacturing companies of all sizes are looking for individuals who are like both Mike and Will, but can't find them. There are jobs out there all over the country for those with the right resume, for the guys with Mike's academic pedigree and Will's experience.

Looking for a Pedigree? If you are long on experience, like my friend Will, and are looking to put academic

achievement on your resume, the simple answer is to get an engineering degree. If you can do this, there are jobs available immediately. You can work as an engineer, consult, or even open up your own shop. However, there are barriers to getting an engineering degree. The time commitment, balancing this with workload, family, and other things, can make an engineering degree difficult to complete. Another big barrier to gaining the degree is—Calculus. Yes, accredited engineering programs require Calc and this proves to be an insurmountable hurdle for some people of all ages. So I have some tips here to help gain some academic stature without going through the engineering route.

First, consider certifications that demonstrate your knowledge. A diploma in engineering represents that you have mastered a set of tools and a way of thinking to solve problems. You can demonstrate that you have mastered tools and thinking by achieving respected professional certification. For example, the SME offers certifications as a Certified Manufacturing Engineer (CMfgE) and a Certified Manufacturing Technologist (CMfgT). If you have a resume that is full of manufacturing experience, then pursue the CMfgE track. The study area is “learnable.” Moreover, the “theoretical” part of this test (math, fluids, dynamics...) can be addressed by taking a couple of courses at a local community college.

This is much easier than getting a four-year degree and taking all the general education requirements (history, anthropology, art history...) that you really don't need.

There are other certifications that also can build a resume. For example, the American Production and Inventory Controls (APICS) society offers certifications in production operations. Prep classes are usually held on weekends as are certification tests. APICS certification is well-respected.

Getting certified as an ISO 9000 Assessor is also a very well-respected certification. There are usually short courses available to get the first level of the certification done.

Another respected certification is the SME Lean Certification. I have reviewed the materials and am impressed with the simple, straightforward presentation and its ability to prepare you for the certification tests.

Then there are technical/software certifications. For example, certification in MasterCam (for my money the best CAM program in the world) is sometimes even offered at local community colleges. I think certification in this excellent tool should be required for all manufacturing engineers. However, without some hands-on experience running machine tools, you really don't understand what MasterCam does and what the input values really mean.

Many of these certifications can be done at home with tests administered over the internet. So, it is convenient and simple to do these, which can help augment your experience with the certified pedigree.

Now, imagine a resume with 15 or more years experience on the shop floor, a degree in business (if engineering is too tough), and certification as a CMfgE (from SME) and a MasterCam Cert. My friend, there will be a lot of people interested in talking to you!

Degreed Engineer Looking for Experience. For those out there that have been tube jockeys or paper pushers longing to actually build things with their hands and brains, the problem is getting experience. So, where do you go without starting at the bottom again? The answer: community colleges. Many community colleges offer manufacturing courses and degrees ranging from using machine tools, CAD, CAM, robotics, and more. Usually these are inexpensive courses, many offered on nights and on weekends. However, not all programs offer the same opportunity to get your hands on the latest and greatest equipment. So, another thought is to go to community colleges and examine the facilities and equipment and make sure it is what you are looking for.

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I want to also plug a great thing that Haas Automation (Oxnard, CA) is doing in their partner program with learning institutions across the country. In this program Haas works with community colleges, providing them modern equipment for training their student technologists. My advice is to find one of the community colleges that is a Haas Technical Education Center (HTEC) and go there. If you are going to spend the time, make it worthwhile. You can even check the internet at <http://www.htecnetwork.org/index.cfm> to find a school near you.

I give my students, whether undergrad, Master's, or PhD-level, the same advice that I have imparted here. While they are pursuing their

undergrad or master's degrees, I advise them to go to the local community college and get some hands-on experience. They have thanked me for this advice, and those that have done it have been hired quickly within days of graduation.

The Future of Manufacturing. In many ways I see manufacturing being reinvented in the next ten years. I believe that the way to a new future is going to be led by the seismic shift to nanomanufacturing and micro-manufacturing. While we can talk about the theory and experience in current "macro" manufacturing as we have done above, it is clear that no one has long experience in nanomanufacturing. Nanomanufacturing theory is being developed right before our eyes, with models of manufacturing being reinvented on a daily basis. In some ways, this puts everyone on an even playing field, so there is a chance to "reinvent" your career by leaping into this "brave new world." Staying current through magazines, books, and the internet is a great start. There are growing classes in nanomanufacturing at colleges (I teach one myself and taught it at Ford to help their engineers). Conferences provide short courses which can help you prepare for the future of nano, I strongly advise making it a goal next year to go to a conference (like SME's) and take advantage of an "intro to nano" short course to prepare for the future.

In the end, it is a question of survival. For manufacturing professionals to survive, they need both theory and experience to gain employment and promotion. For manufacturing companies to compete, they need the professional who brings both theory and experience to the company. In the end, we all need to be like Mike and my friend and mentor, Will, to achieve personal and industry success. ■