

Is manufacturing plant experience required to enter design and R&D jobs?

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I started my career in industrial R&D. I wanted to invent things, and make things better, not keep things running. I enjoyed the innovation and creativity of the process development function, but found that plant people were very reluctant (usually opposed) to implement things we "proved" in the lab or pilot plant.

After about 3 years, the company transferred me to a manufacturing plant in the Technical Support group. Despite my reluctance to leave the personal affirmation of R&D, I came to enjoy the plant people, the magnitude of the impact of just slight process improvements to the company, process control, statistical analysis, economics, and analytical trouble shooting. Unexpectedly, I learned much! And now, I greatly appreciate the benefits of that experience.

Then R&D folks, with their naive certainty, came to the plant to tell us the improvements that they wanted to implement. "Lock the gates! Turn off the lights! Nobody home!" was our cry. But upper management had approved the plant trials. What happens? They come, make changes, then leave on their 9-5 schedule. We were left to fight process complications, soothe operators, which, of course, happens at 2 AM, on weekends.

As others have responded to the question, I think it is very important that people in Design and R&D have significant plant experience to be able to understand the myriads of issues that manufacturing must deal with. They need to shape their innovations to accommodate the manufacturing context reality.

On the other hand, naivety permits creativity. Whereas, significant real-world experience "knows" a possible innovation will not work, this hampers transformation. So, it might be good to have inexperience and out-of-the-box creativity on design teams. However, design novices need to be well-supervised by experienced coaches. If experience supervises novices, then realism can be embedded in creative solutions.

For many graduates who are seeking employment, the design environment (attractive space, use of simulators, comfortable dress, landscaped building) is much more attractive than the often-uncomfortable field or manufacturing environment. As a parallel, for students, the capstone design course is usually much more enjoyable than the unit operations course (noisy, dirty, PPE, aggravating reality). So, if a company wants to hire office- or development-oriented students, they may have to offer them entry into design or R&D jobs. Then be sure that their supervision provides a comprehensive reality balance.

As a third stage in my career, I was in the Product Development group in the Marketing organization. My job was to direct innovations in our products to make them more competitive in our customers' manufacturing processes. Here, my manufacturing experience was essential to establish credibility with our customers. Also, the joys related to making our products more competitive were unexpected, and seeing how our customers ran their business gave me insight as to how we might also.

When I returned to supervising technical support engineers in my old manufacturing plant the insights from Marketing and R&D were very beneficial.

The last part of my career was as a chemical engineering professor, where I believe the diverse industrial experience gave me relevance and creativity advantages in both teaching and control research.

Maybe the question should be broadened to "Does diverse engineering experience contribute to effectiveness in other engineering jobs?" I say, "Yes, very much".

So, 1) Supervise novices by folks with diverse experience. 2) Let ambitious employees know that if they want to get promoted, they need to have company-wide experience. 3) After three or so years, when they get the hang of their current function, move ambitious employees to very different functions for the benefits of experience broadening.

To develop your potential, after building competency in one engineering function, accept transfers to others. Embrace the experience you will bring to the new function and the benefits that new experiences will give you in your career future.

Russ Rhinehart started his career in the process industry. After 13 years and rising to engineering supervision, he transferred to a 31-year academic career, serving as the ChE Head at Oklahoma State University for 13 years. Russ is a fellow of AIChE and ISA. Now "retired", he enjoys coaching professionals through books, articles, short courses, and postings on his web site www.r3eda.com.