

Jack Bolick, president of Honeywell Process Solutions, [www.acs.honeywell.com](http://www.acs.honeywell.com), Phoenix, Ariz., a leading maker of industrial control systems, is very outspoken about the problems facing manufacturing and the education system within the United States. In an effort to revive the educational effort and spark new life into manufacturing, Bolick speaks openly and candidly with *Start* Editorial Director Peggy Smedley. What follows are excerpts from an interview that Bolick conducted with Smedley for her new book "Mending Manufacturing."

**Q. What do you think is happening to manufacturing?**

A. Manufacturing has been facing unbelievable pressures related to technology. An article I read recently said that in the last 30 years or so in the United States we've been in the final phases of globalization where competition is equaling out from continent to continent. And, according to this article, all of this has brought on a state of "economic marshal law"—economics controls everything.

By the time I was 35-years-old, I had spent over half of my life in manufacturing and seen many changes take place. The first spreadsheet came out in the mid to late 1980s when VisiCalc first came out. Before that, we used paper spread-

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sheets and relied on mechanical, programmable machines to do the algorithms.

Once we had all the data input on a spreadsheet we would extrapolate information. After VisiCalc, Lotus, and Excel came out, and that's when the leveraged buyouts started. That's when economic marshal law commenced. Suddenly, any accounting or finance person could get

data off a mainframe and start crunching data very quickly. They found out a lot of interesting things that way. There were companies just sitting there kind of fat and lazy with tons of real estate that they had to revalue.

That ignited a lot of these leveraged buyouts. Then came the birth of the productivity phase when that same computing power kept getting faster.

There used to be secretaries at every desk, and we made our formal presentations by using the old quarry lettering machines. Then all of a sudden, Harvard Graphics came out, and pretty soon you had a system for one out of every 30 or 40 people instead of having one secretary for every five or six people.

As we moved up the technology curve, more of the "technology" jobs went to Korea and Taiwan. It took Korea about 20 or 30 years to move up the curve, but now, they're as state-of-the-art as we are today and their standard of living is about the same as ours. Now India and China are coming on board.

The difference is those countries produce six times as many high-quality graduates as the U.S. and Germany. The difference right now is that China and

India are coming up that curve much faster. Economic marshal law, so to speak, has kept inflation down and created too much capacity—it's caused everybody to hold pricing. We don't have the normal cycles that we used to have.

Now what's happening is everybody has to think of a bigger and better



mousetrap. It's not a different mousetrap; it's just bigger and better. Who would have thought that we'd be paying three bucks for a bottle of water?

**Q. Was this visionary manufacturing or just marketing?**

A. That was wonderful marketing. Is there really value in that bottle of water versus a beer or a Coke or anything it takes to produce that? No. And yet, we spent years just trying to get from the well to tap water. And you know how good tap water is, even today. What comes out is probably just as good if not better than what is in that bottle of water.

Innovation is the ability to bring manufacturing, marketing, and all those skills to bear. You know how you convince the public to buy? Understanding your customers. What's the value proposition? How does it really have value to help them in this state of economic marshal law? I think that means better education, it means more innovation in R&D, and less tax regulation. I think what's holding us back in this country is our education system.

Students don't perceive there to be many opportunities in manufacturing.

So how do we know where to invest our money and get back that edge over the competition? The competition is changing. We've got these big mega markets, totally new economic poles that have to compete globally. I think it's important to keep free trade flowing between them. That's very important. It's important that we not get bogged down in all kinds of regulation.

**Q. Would you then say that more of the problems tend to be our culture vs. the way that students think manufacturing is a greasy job?**

A. I think it is. When we said, "Put a man on the moon," that was a clear

through a national campaign. Lee Iacocca did it with restoring the Statue of Liberty. We've got to galvanize our population to get a cause. Japan's a good example. They'll come out and say they're going to be No. 1 in the electronics industry. When Ronald Reagan was president, we were at kind of a low point, and he rallied the people to believe we were the best in the world. He was kind of the glue that made it all come together. We need a charismatic leader to step up like that. One thing I will say for sure about Americans—we're winners. You know, we can't stand to lose. And if we focus on something, and we really want to do it, we'll go do it. So it's really just getting that focus.

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directive that the whole country got behind and it drove a lot of technology. Today, I don't think we have that vision. Homeland security is the only thing I can think of right now that's really galvanizing the drive to technology. It's putting money through Congress to go look at manufacturing and find ways we can be more secure. There's not a real positive image of manufacturing. The base of the problem is more the family unit and the education system.

**Q. How do we get today's students to want to enter the manufacturing arena?**

A. I don't like to say that government is the answer to a lot of things, but I do believe that there should be commonality across all of our wonderful states and territories in terms of education and security. I don't know who else can do it other than the government to step up

**Q. One of the things that we've said repeatedly in manufacturing, is that if we don't do some things now—and maybe education is a part of it—but if we don't rectify the problems quickly, we could become a Third World country. Would you agree with that?**

A. One of the best things about America is that it's a melting pot. Some of the world's brightest flock to this country to live and work. There has been an overwhelming injection of knowledge in this country to compensate for some of our woes and our poor education. I think if we put barriers up and start shutting our borders, that could be a major problem. We have to have a good environment. We have to make sure we don't just overload on regulations. We just can't stick our head back in the ground like we've done in the past. I think we'll be okay if we don't overregulate, and we start getting some of these things, like education,

back on the top of the agenda again. I think manufacturing, all of it will be okay, because the innovation will come, and with innovation will come new jobs.

**Q. What else should we talk about in the education system, or any other part of the manufacturing crisis we're in?**

A. It is a very complex problem. But I tried to give you some insights, at least, that I believe got us where we are today. Some of us just think this is a natural progression of the economy around the world. The only difference is, it's speeding up. And let's not forget, one of the things that got us in trouble in the '60s for awhile, and we came back from that, was that we bombed Europe and Japan to the ground during World War II. And then we helped them by investing, and we owned a lot of manufacturing companies over there. They helped put the latest and greatest technology into place. And then what happened is, coming into the '70s, we went through a lot of pain because those guys were so much more productive than we were. They had the best factories. What had we done? We had old equipment. Then we went through revitalization.

Everybody said the Japanese miracle was going to roll over us. But we went through a huge revitalization and got ahead of the curve. We moved way ahead of the curve with Microsoft. These are cycles that tend to repeat. We need to look at the past to project the future. We need to continue to invest and not overregulate. Then manufacturing will be okay.

I do believe we need a little more of a plan to getting this noise out of the way and to get education back on the top of the agenda. We tend to wait until there's a crisis to get issues back on the top. But, we also tend to move fairly quickly to fix something.