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All Ashore? Reshoring Highlights Value of Analytics to Pick Best Manufacturing Sites

Manufacturing products in the United States or China or Timbuktu isn't the issue. Making fact-based decisions about what's right for your company and your global customers is what matters most today.

Mike Newkirk, SAS | Jun 15, 2012

The Boston Consulting Group published the results of an interesting survey in April that showed a third of manufacturers are considering "reshoring" back to the United States from China. The survey received a lot of attention, but not for the reasons I thought it would.

Initial articles resulting from the survey have focused on rising wages in China, and improved plant automation in the U.S. But buried several paragraphs down is what I consider the real story: manufacturers are beginning to understand the true cost of manufacturing overseas, and 70% of those responding agreed that "sourcing in China is more costly than it looks on paper."

It's not just about sourcing in China. Consumption is no longer a one-way street. Once you built a cell phone in China with the plan to ship it to the U.S. Today, some of those phones are being sold in China, too. Opening a tractor plant in India is less about seeking a low-wage workforce and more about serving the growing need for tractors in India. Manufacturers also are under pressure to shorten product cycles, offer a broader array of customization, and shoulder some of the risk once felt by distributors and retailers. In other words, where to manufacture a product is a more complex problem than simply calculating wages and shipping costs. Reshoring is merely a symptom of that. Manufacturers need to think about several factors as they choose where to build products and how to source materials for those plants.

Supply Chain Decisions

The Japanese tsunami of 2011 is a perfect illustration of supply chain volatility and its hidden costs. Japanese automakers supply their North American customers with products built mainly in North America. For example, the Toyota Camry is more "American" than many cars built by Detroit. But the tsunami exposed a weakness: several key parts for North American factories came from Japan, and only Japan. Weeks of backlogs in getting parts to the U.S. came just as auto sales were beginning to turnaround for all automakers, and the bottleneck cost the affected companies a reported $1.3 billion.

Manufacturers need the ability to model "what if" scenarios to anticipate possible supply chain disruptions and then choose the most cost-effective means of avoiding them. Modeling that uses causal data like weather events or war disruptions -- or less ominous events like promotions -- should be a regular part of a robust forecasting business process.

Mass Customization Demands

In my grandfather's day, Henry Ford promised you can have any color of Model T you want as long as it was black. Customization was non-existent. Forty years later my dad could scarcely believe that he only had to wait four weeks for his "specially" built 1968 Buick Electra 225. Today, my daughter can waltz into the Apple store where they have devices in a multitude of colors and, oh yes, she also can have her name imprinted on the device she buys. We are on the cusp of some manufacturers being able to predict each customers individual preferences before they come to shop, whether online or in a bricks-and-mortar store. For post-modern shoppers, it is all about us. We want unique products that express our personality. The manufacturers who thoroughly know their customers and have the data and advanced analytics to gain insight from that data in a timely way will win the day.

oxymoron, but whoever figures out how to anticipate the individual consumers preferences and build it before they come, will own the market.

Shorter Lead Times

Electronics and soft goods manufacturers are increasingly being asked to shoulder the burden of getting the right amount of the right product to the right stores at the right time. Once upon a time, retail buyers would place an order for 100,000 pairs of a new style of athletic shoes and put the shoes that didnt sell by the end of the season on the clearance rack. Today's realities mean buyers now will place a smaller initial order with the contractual expectation that the shoe manufacturer will keep plenty of product in the pipeline. With that dynamic in place, suddenly an overseas plant is no bargain -- especially given the costs of expedited shipping to fulfill contract demands. But what if the local market has developed an appetite for some of the product being made there? In this case, analytical inputs to the sales operation and planning process can help manufacturers make cost-effective decisions regarding the balance of unconstrained demand and constrained supply, shipping costs and risks and time to market. Maybe the new model dictates that a Chinese plant is still a good bet for a large initial run -- along with the mass production of products for the Chinese market, while a smaller North American plant is tooled to handle restocks of hot products. Perhaps the Chinese plant should build the base product (that also can be sold as is in that market), with the North American plant customizing it for local tastes.

A similar optimization puzzle comes into play for the makers of heavy equipment. Shipping earth moving or agricultural equipment is costly, so it makes more sense to build that equipment near where the earth needs to be moved or where the corn needs to be harvested. Manufacturers need a keen understanding of not only where demand is today, but where it will be in 10 years as they plan plants and the supply

excellence center that works with dozens of business units. Using this analytics know how, they determine whether and when to open plants in new markets, how much supply will be required, how much demand to expect by product line, how much raw material prices will fluctuate and other key factors that could sink them if they get it wrong. The profit on many of these products is narrow, so their analytics-driven decisions have an enormous impact. One interesting trend that has come out of their work is that decision-making executives now are schooled in analytics, and they make decisions based on the facts analytics deliver. It has become a critical part of their culture. They are not surprised to see a statistical analysis for any question because it is now a part of their corporate DNA.

When will analytics become a part of your company's DNA? Making manufacturing, supply chain or operational decisions without an analytics foundation is a sure path to lost opportunities and lost profits. Manufacturing products in the United States or China or Timbuktu isn't the issue. Making fact-based decisions about what's right for your company and your global customers is what matters most today.

Mike Newkirk is the Director of Manufacturing and Supply Chain Solutions at SAS.

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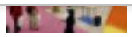

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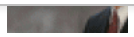

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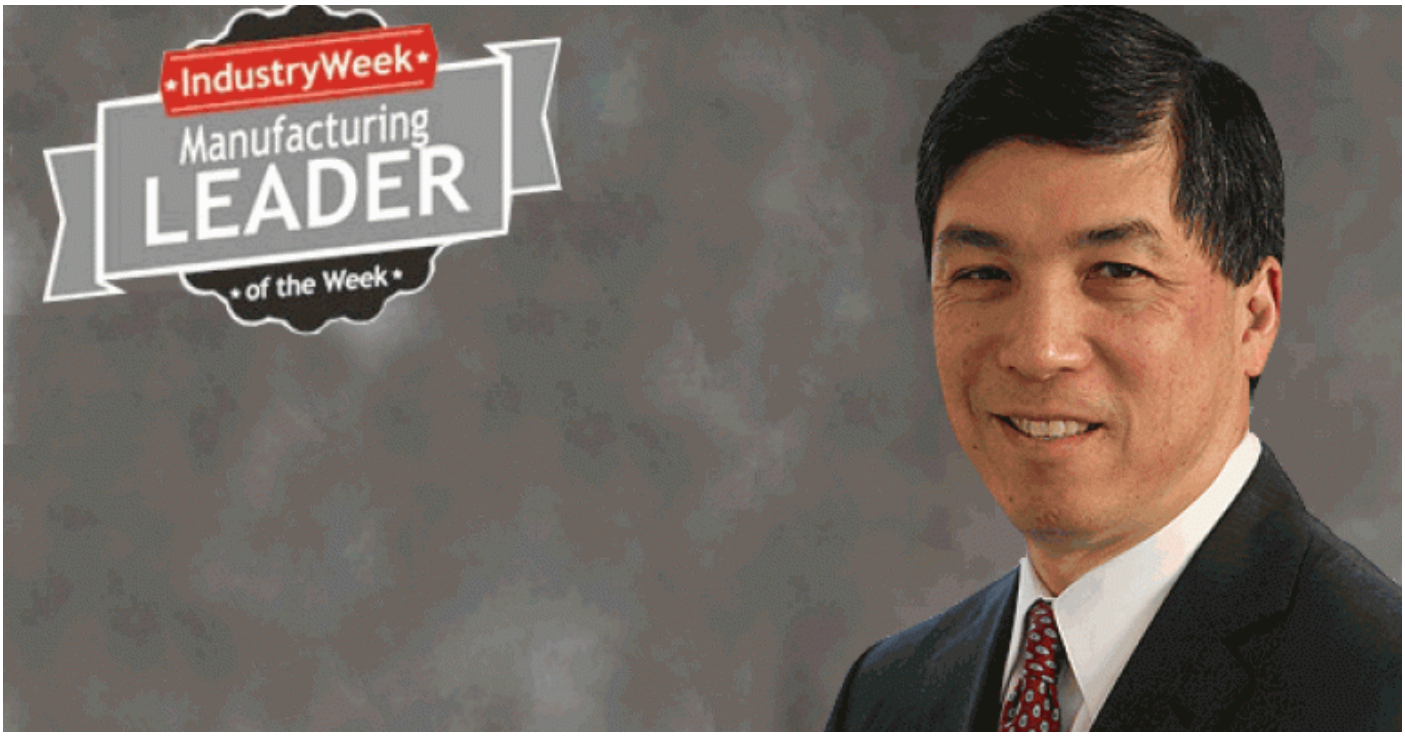

Organization: Harvard Business School

Previous Employers: IBM, Eastman Kodak, Thomson, Ofoto, Silicon Graphics

Education: PhD, chemistry, University of California, Berkeley

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Shih's Watchword: Make the US an Attractive Choice for Manufacturing

Bring iPhone manufacturing to the U.S.? Harvard Professor Willy Shih thinks policymakers instead should focus on ensuring our manufacturing strengths stay that way.

Steve Minter | Dec 19, 2016

What should be done to strengthen American manufacturing? It's the question of the hour given President-elect Donald Trump's promise to dramatically boost U.S. manufacturing employment. Trump campaigned on rewriting trade treaties as a way to make the United States a more competitive nation and bring back factory jobs. He has not been shy about criticizing U.S.-based companies, such as Carrier, that plan to move jobs outside the country.

But during the campaign, one of Trump's most frequent targets was Apple, the world's most valuable corporation, which he repeatedly challenged to build its iPhones in the United States rather than China.

Willy Shih, a Harvard business professor and industry veteran, is skeptical that

work on U.S. manufacturing, "Restoring American Competitiveness" for the *Harvard Business Review*. In fact, he points out, many critical electronic components such as flat panel displays have never been produced in large quantities in the U.S.

Virtually all the components that go into an iPhone, for example, are made overseas. So even if Apple, or more likely a supplier such as Foxconn, were to invest in an assembly plant in the United States, the components of the phone would still be made elsewhere. Building the component factories in the U.S., says Shih, would take longer than two Trump terms in office and cost billions of dollars. He doesn't believe that global supply chain will be recreated in the U.S.

Then there is the question of what kinds of jobs would be created in the U.S. In recent years, says Shih, many of the jobs that have moved offshore have been low-wage assembly jobs. He says the U.S. has lost the workforce that is willing to do those types of jobs. He points to Motorola's attempt to build the MotoX phone in Texas.

"They couldn't get people who wanted this kind of work," he notes, "and they were good jobs."

Americans' attitudes toward repetitive work and the spread of automation have combined, he says, to change the "picture of what kinds of factory jobs there are in many cases." Turning back the clock to a time of millions of assembly-oriented factory jobs, says Shih, is not going to happen.

Apple does do some manufacturing in the United States. It makes its Mac Pro desktop computers in Austin, Texas but, notes Shih, that is a relatively low-volume, high-value product. When companies such as Apple introduce a new model of their cell phones, the supply chain has to be able to move massive amounts of products

Shih recommends a different focus for strengthening U.S. manufacturing.

“Before we wring our hands too much about bringing things back, I would make sure the areas we are strong in will continue to be strong for the foreseeable future,” says Shih.

Shih disputes the idea that American manufacturing is in terrible shape. “It clearly varies by sector,” he contends, pointing to strengths in sectors such as aerospace, pharmaceuticals, and advanced materials.

To build on these strengths, he explains, policymakers need to create a business environment where manufacturers want to locate their businesses and can operate competitively on the world stage.

How do you do that? Shih says there are several states where governors have provided a model. One prominent example is South Carolina, where he says Gov. Nikki Haley (who President-elect Donald Trump has selected to be U.N. ambassador) “has done a terrific job recruiting businesses” into the state.

As evidence, Shih points to the BMW factory in Spartanburg, the largest BMW facility in the world. That plant is wrapping up a $1 billion expansion that increased the workforce by 800 jobs and provided it a production capacity of 450,000 vehicles annually. Mercedes Benz and Volvo have also opened factories in the Palmetto state. These OEMs have attracted a growing cadre of auto suppliers. Over 250 companies produce auto parts in the state now.

The state also has seen its aerospace industry grow quickly since Boeing announced in October 2009 that it would establish a factory in North Charleston to assemble the 787 Dreamliner aircraft. That facility employs more than 8,000 workers.

Shih says other states such as Texas and Indiana have also worked successfully to attract manufacturing. He acknowledges they use incentives in luring manufacturers to their states but says that providing incentives is the norm here and internationally.

“Realistically, most major production facilities have some kind of government assistance, either in infrastructure to support the factory or tax abatement or whatever,” he says.

Taxes and regulations are two areas where the incoming administration has promised to provide relief to the business community. Shih agrees that they are important pieces of a movement to attract and grow manufacturing.

“People look at corporations and tax rates and say, ‘Oh, we ought to tax them more,’” he says. “If you do that, all you do is push them to places like Ireland or Singapore.”

Along with more competitive tax rates, Shih says, the U.S. needs to simplify its regulations. He compares the Glass-Steagall Act, which was passed in 1933 to regulate banking and is 37 pages long, with the Dodd-Frank financial reform law enacted in 2010, which is some 2,300 pages. “Who really understands all those regulations?” Shih asks.

Shih says businesses are facing not only more complicated regulations but that these regulations are written by people who don’t understand the effect they will have on companies. Section 1502 of the Dodd-Frank law on conflict minerals is well-intentioned, says Shih, but the regulation “doesn’t really reflect an understanding of what the supply chain for those minerals is.”

While a more business-friendly environment will help to create more manufacturing jobs, there is a strong countervailing force. Shih says advanced economies are increasingly investing in automation.

Germany, where automation is being driven by the automobile industry, is “quite aggressive” in its Industry 4.0 effort, notes Shih. The country is banking on its investments in the industrial internet and advanced machinery to offer mass customization and be competitive despite high labor costs.

China is also making huge investments in automation, says Shih, as it faces a future where its workforce will be shrinking. Chinese leaders, he says, “have no problem scrapping an entire line and saying, ‘We will just automate this.’”

If anything, Shih’s research suggests, U.S. manufacturers are less inclined to invest in automation. The reason: they have existing infrastructure which is working well and which is not fully depreciated. He says there is a parallel with the electrification of American factories back in the late 1910s and early 1920s.

“Electrification of U.S. factories actually went relatively slowly,” he notes, because the water wheels and other power sources of the time were “all paid for and depreciated.”

Providing manufacturers with employees with the right skills is a critical aspect of growing U.S. industry but Shih says that challenge is made more difficult by changes in the relationship between employers and employees. When employees worked most or all of their career at one company, employers had an incentive to invest in keeping their skills up to date. But in recent years, says Shih, U.S. employers have moved to a more transactional model as employment tenure has shrunk.

While U.S. manufacturing faces serious challenges, it also benefits from substantial advantages. One is that the U.S. is still the leader in software, says Shih, an increasingly important part of design and production in manufacturing.

“If you look at where all the major operating systems used in the world are developed, they are in a 100-mile wide stretch of the Pacific coast of the U.S.,” he says.

“We still have the most valuable market in the world,” adds Shih. “My watchword is make the U.S. an attractive location choice.”

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