Made in the USA

Fast. Flexible.
100% automated.
Guaranteed quality.

(No outsourcing
to China required.)

By Brendan I. Koerner

In early 2010, somewhere high above the northern hemisphere, Mark Krywko decided he'd had enough. The CEO of Sleek Audio, a purveyor of high-end earphones, Krywko was flying home to Florida after yet another frustrating visit to Dongguan, China, where a contract factory assembled the majority of his company's products. He and his son, Jason, Sleek Audio's cofounder, made the long trip every few months to troubleshoot quality flaws. Every time the Krywkos visited Dongguan, their Chinese partners assured them everything was under control. Those promises almost always proved empty. ¶ As he whiled away the

airborne hours, Krywko made a mental list of all the manufacturing glitches that had nearly wrecked his company. There was the entire shipment of 10,000 earphones that Sleek Audio had to discard because they were improperly welded, a mistake that cost the company millions. Then there were the delivery delays caused by the factory's lackadaisical approach to deadlines, which forced the Krywkos to spend a fortune air-freighting products to the US. Even when orders were produced on schedule, Krywko wasn't too pleased with the situation: The company always had precious cash tied up in inventory that took months to arrive after the prototypes had been approved.

The headaches had finally become too exasperating to bear. And so, on that flight, he turned to Jason and said that he was done with Dongguan. "I can't do it anymore," he said. "Let's bring it home."

Jason had been thinking the same thing.

When the Krywkos returned to the US, they searched for a manufacturing partner with the tools and expertise to produce their earphones. They found one just a few miles away from their Palmetto, Florida, headquarters: Dynamic Innovations, a maker of ruggedized computers and other equipment. Sleek Audio quickly signed up.

Today, a year since Krywko's decision to go against the offshoring tide, Sleek Audio has a full-scale manufacturing operation that can be reached via a 15-minute car ride rather than a 24-hour flight. Each earphone costs roughly 50 percent more to produce in Florida than in China. But Krywko is more than happy to pay the premium to know that botched orders and shipping delays won't ruin his company. And so far, the gambit appears to be paying off: Based on enthusiastic customer response, Sleek Audio is now projecting 2011 to be its most profitable year ever.

For US firms, the decision to manufacture overseas has long seemed a no-brainer. Labor costs in China and other developing nations have been so cheap that as recently as two or three years ago, anyone who refused to offshore was viewed as a dinosaur, certain to go extinct as bolder companies built the future in Asia. But stamping out products in Guangdong Province is no longer the bargain it once was, and US manufacturing is no longer as expensive. As the labor equation has balanced out, companies—particularly the small to medium-size businesses that make up the innovative guts of America's technology industry—are taking a long, hard look at the downsides of extending their supply chains to the other side of the planet.

"Companies are looking to base their decisions on more than just costs," says Simon Ellis, head of supply-chain strategies practice at IDC Manufacturing Insights, a market research firm. "They're looking to shorten lead times, to reduce the inventory they have to carry." When accounting giant KPMG International recently asked 196 senior executives to list their top concerns for 2011 and 2012, labor costs ranked below product quality and fluctuations in shipping rates and currency values. And 19 percent of the companies that responded to an October survey by MFG.com, an online sourcing marketplace, said they had recently brought all or part of their manufacturing back to North America from overseas, up from 12 percent in the first quarter of 2010. This is one reason US factories managed to add 136,000 jobs last year—the first increase in manufacturing employment since 1997.

The US certainly isn't on the verge of recapturing its past industrial glory, nor can every business benefit by fleeing China. But those that actually build tangible goods should no longer assume that "Made in the USA" is an unaffordable luxury. Unless a company is hell-bent on selling the cheapest goods possible, manufacturing at home makes more sense than it has in a generation.

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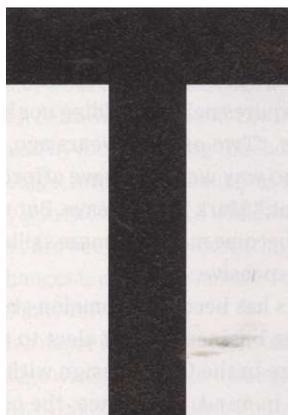
Think of offshoring as a technology. Like any relatively young and successful innovation, it enjoyed a honeymoon period during which everyone scrambled to adopt it, lest they miss out on the gold rush. But now many companies are starting to grapple with this new technology's limitations.

The core component of offshoring, of course, is cheap labor. In 2000, when Congress was preparing to vote on normalizing trade relations with China, political opponents of the bill gave their colleagues satchels containing three pennies—supposedly the average hourly wage for Chinese workers. That figure was exaggerated, but the spirit of the stunt rang true: US manufacturers couldn't possibly compete with China's blend of rock-bottom wages and rising technical savvy. Once the bill passed, the offshoring trickle that started in the 1980s became an unbridled flood.

Chinese factories deftly took advantage of this situation by making it easy for even the smallest US startups to find manufacturing partners. Factories polished their English-language outreach and established ties with professional middlemen. Soon anyone with a blueprint and modest capital could hire a Chinese factory to stamp out 20,000 units of a video tripod, an ergonomic joystick, or an espresso machine.

But the system has started to overheat. Manufacturing wages more than doubled in China between 2002 and 2008, and the value of the nation's currency has risen steadily. It's now under tremendous international pressure to let the yuan appreciate even more, and the country must cope with worrisome inflation at home (food prices rose by nearly 12 percent last year). And though Chinese workers still earn a fraction of what their American counterparts do, the rising costs of labor there are prompting companies to reevaluate their production strategies.

Once they do, these businesses often realize something profound: China isn't the great deal they expected. A January 2010 survey by the consulting firm

long delays or hastily assembled products (or both).

"If you're a huge company like Apple, you can get the whole factory to work for you," says Paul King, founder of Hercules Networks, a New York company that makes charging kiosks for mobile devices. "You can put your own process in place, you can have your own quality control. But without that kind of power, you're just another customer, and they don't really care." King cycled through three Chinese factories from 2008 to 2010 before giving up on offshoring due to persistent manufacturing errors—LCDs that winked out after six months, lights that broke when tapped even gently. The quality woes have disappeared now that Hercules is making its kiosks in the US, King says, and the company is thriving.

To deal with their production backlogs, many Chinese factories have started subcontracting work to facilities located in

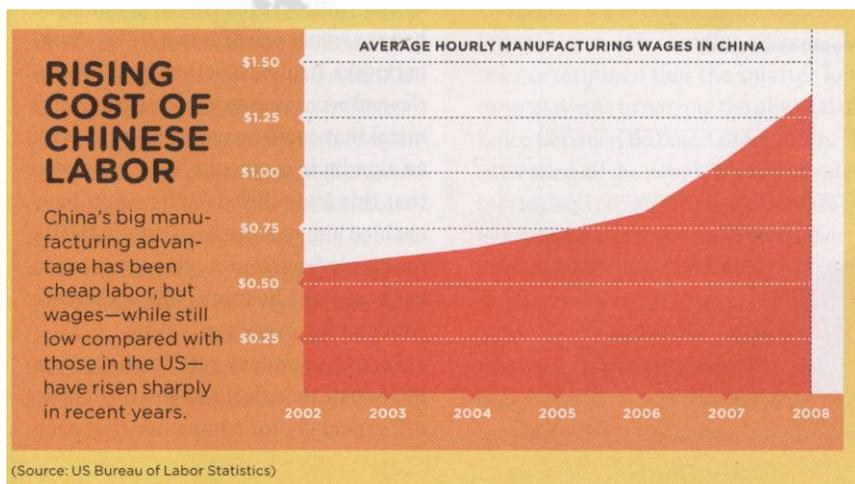**One reason for abandoning China is quality: Some products are too flawed to sell.**

Grant Thornton found that 44 percent of responders felt they got no benefit from going overseas, while another 7 percent believed that offshoring had actually caused them harm.

One big reason for this growing dissatisfaction is quality. Like Sleek Audio, countless US firms have received long-awaited shipments only to discover that the products are too flawed to sell. This problem is due largely to China's success: Factories are so overbooked that they have no choice but to favor their biggest clients. The smaller customers can end up facing

the center and western areas of the country, where labor costs are cheaper than on the industrialized coasts. But this usually makes the problems even worse. "They'll subcontract your work without providing the subcontractor with the same training that you provided to them," says George T. Haley, a professor of industrial and international marketing at the University of New Haven who specializes in Chinese business. "Then all of a sudden, your quality assurance goes all to hell."

In addition to quality issues, subcontracting also exacerbates a second major problem with Chinese manufacturing: the lack of safeguards on intellectual property. The more subcontractors that get their hands on a design, the greater the odds of IP theft. Peerless Industries, an Illinois company that makes flatscreen and projector mounts, learned that lesson the hard way. "Knockoffs of our products started showing up in markets here in our own backyard," says Michael Campagna, Peerless Industries' chief operating officer. "It wasn't necessarily our supplier doing it - it was our supplier's supplier."

Finally, sheer distance remains an intractable problem. Shipping costs nose-

RISING COST OF CHINESE LABOR

China's big manufacturing advantage has been cheap labor, but wages—while still low compared with those in the US—have risen sharply in recent years.

AVERAGE HOURLY MANUFACTURING WAGES IN CHINA

$1.50
$1.25
$1.00
$0.75
$0.50
$0.25

2002 2003 2004 2005 2006 2007 2008

(Source: US Bureau of Labor Statistics)

dived in the wake of the 2008 financial crisis but have since crept up as oil prices drift back toward $90 a barrel. And then there's simply the time it takes to get goods from China. With credit hard to come by these days, companies are reluctant to tie up cash in inventory that takes three to six months to manufacture, ship, and clear customs.

When you include all the various drawbacks and costs that don't appear in a factory's price quote, manufacturing certain high tech goods in China can end up being surprisingly expensive. In 2008, three McKinsey consultants analyzed the production of midrange servers, taking into account everything from shipping to quality to exchange rates. They concluded that fabricating such devices in China made sense in 2003, when the required labor was 60 percent cheaper there than in the US. At that time, they estimated, the per-unit savings ran about $64. But this advantage, McKinsey concluded, had vanished by 2008: "After factoring in the higher labor and freight costs, we find that the former offshore savings have turned negative—a burden of an extra $16."
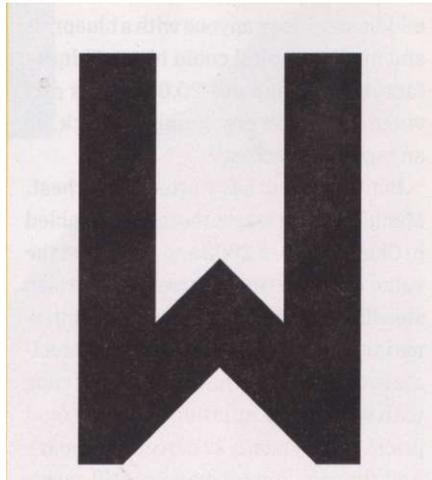
When Mark and Jason Krywko started looking into how they could return Sleek Audio's manufacturing to the US, they quickly realized there was only one way to make the move feasible: Minimize the role of humans on the assembly line. And that meant redesigning products to take advantage of automated tools. After all, Chinese labor may be cheap—but a robot works for less.

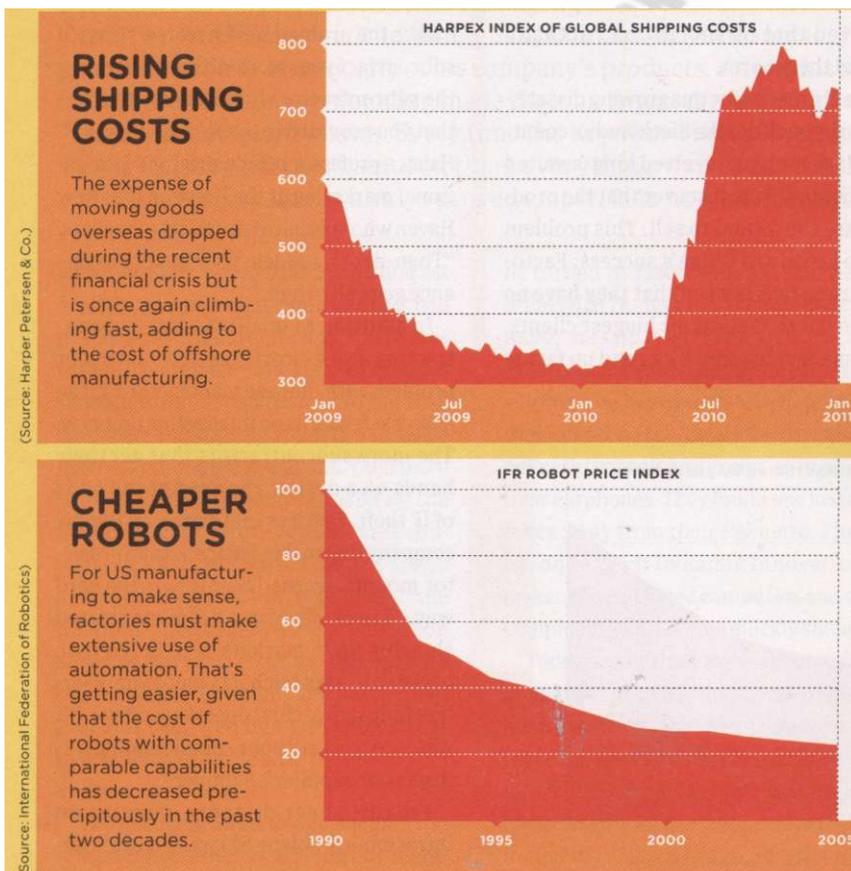Sleek Audio's SA6-R earphones featured plastic side panels that the Chinese factory had to weld into place by hand. The company decided to automate the process, replacing human labor with robots. The Krywkos redesigned the entire product around a solid aluminum center that the speaker gets fitted into; assembly requires neither welding nor human hands. "Two or three years ago, there was no way we could have afforded to do that," Mark Krywko says. But robots have become markedly more skilled and less expensive.

This has become a common strategy among businesses that elect to manufacture in the US: Redesign with labor costs in mind. In essence, the companies are innovating around cheap labor. "We've redesigned products five or six times, trying to reduce the number of connectors, the number of screws, anything that would require additional labor," says Albert VanLeeuwen, chief financial officer of QSI Corporation, a Salt Lake City manufacturer of rugged data terminals that has resisted the siren call of Asia. "With some of the products we're introducing this year, we've decreased the labor content 40 percent."

One of the most important cost-cutting innovations has been the development of less labor-intensive methods for making the printed circuit boards that are essential to all electronics. Fabrication used to require numerous workers, who would place the parts on each board by hand. "Now we put the board in one side of a 160-foot-long chain of machines, and it comes out the other side finished—all the thousands of connections soldered perfectly," says Dana Morey, executive vice president of the Morey Corporation, a Chicago-area electronics manufacturer.

Another way to limit production cost is to swap in less expensive though equally resilient materials. When Hercules Networks' King severed ties with China, he had an engineering firm analyze his charging kiosks. It found that the Chinese factories had been using an unnecessarily heavy metal that could be replaced easily with an aluminum composite. King estimates that this and other design tweaks have enabled him to make his kiosks in the US for barely 5 percent more per unit than in China—and he thinks that soon there won't be any premium.

Even if a company gets stuck paying a little extra, though, it's often a wise trade-off, especially for companies that need

RISING SHIPPING COSTS

The expense of moving goods overseas dropped during the recent financial crisis but is once again climbing fast, adding to the cost of offshore manufacturing.

HARPEX INDEX OF GLOBAL SHIPPING COSTS

800
700
600
500
400
300

Jan 2009 — Jul 2009 — Jan 2010 — Jul 2010 — Jan 2011

CHEAPER ROBOTS

For US manufacturing to make sense, factories must make extensive use of automation. That's getting easier, given that the cost of robots with comparable capabilities has decreased precipitously in the past two decades.

IFR ROBOT PRICE INDEX

100
80
60
40
20

1990 — 1995 — 2000 — 2005

to be nimble enough to make changes on the fly. For example, many businesses look to bigger players to determine the price of parts. If a Goliath decides to order millions of a certain component, the Davids can benefit by incorporating the suddenly cheap widget into their products as well- but only if they do it quickly, while loads of that part are being made. Executing such rapid changes is difficult when the factory is 8,000 miles away.

This is a major reason why Networkfleet, a San Diego wireless vehicle-management company, decided to keep its manufacturing in the US after flirting with China two years ago. "In my industry, the guys who drive costs are the guys who make, say, the individual components for OnStar modules," says Diego Borrego, Networkfleet's founder and vice president of product engineering. "Those are high-volume pieces, so we need to be able to adapt our devices to take advantage of that hardware. To stay cost-competitive, I need to be able to make those changes fast." Networkfleet concluded that it couldn't make speedy alterations if it partnered with a contract factory in Shenzhen.

Large companies don't only determine parts for their smaller brethren; they also create demand for innovative products that complement their own. (Think, for instance, of the enormous accessories industry that's sprung up to support mobile phones and audio players.) The best way for companies to capitalize on new demand generated by something like the iPad is to act quickly, getting their wireless keyboard or speaker system on the market before the competition. When time is of the essence, there are obvious advantages to having a supply chain that's thousands of miles shorter than your rivals'.

"Our sales team had a meeting in October and found out there was no articulating wall mount available for the Samsung 9000 TV," says Campagna of Peerless Industries, which is now manufacturing in Aurora, Illinois. "Within four weeks, we'd designed a new mount and had it on the market. No way could we have done that in China. It probably would have taken us eight to 12 weeks."

True, Peerless probably could have made those mounts in China for a bit less. But the company would have entered a market already flooded with competitors instead of leading the way.
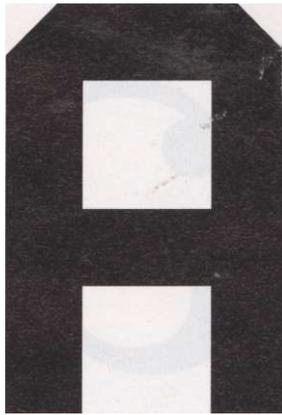
A company that sells tens of thousands of units a year may no longer see the wisdom of sending its manufacturing to China. But what if that company wants to scale up and sell millions? Big customers get more than just the best price quotes and most prompt service from Asian factories; they also frequently receive massive government subsidies and perks. When a nation offers to pay hundreds of salaries and throw in free land to boot, an ambitious company can find it hard to say no.

But there is evidence that large corporations are no longer automatically swayed by these goodies. In October 2009, NCR decided to stop manufacturing its North American-market ATMs at facilities in China and India and make them instead in Columbus, Georgia. Last October, General Electric elected to invest $432 million in four new US manufacturing facilities that will build environmentally friendly refrigerators and water heaters. These are precisely the sort of companies that stand to benefit the most by heading overseas. But they determined that the smarter long-term play was to narrow the physical distance between R&D and production. "By colocating all the people who are involved in bringing a product to life, we increase collaboration and problem-solving and shorten development time," says Kevin Nolan, GE Appliances' vice president of technology.

To be sure, the age of offshoring is far from over. The largest companies will continue to manufacture overseas more often than not—the raw economics still demand

it. Once a company gets big enough, it can afford to hire full-time staff in Asia or build its own factories outside Shenzhen, taking advantage of cheap labor without incurring many of the headaches that haunt smaller players. And even if dozens of little companies decide to stay in the US, they can never create as many manufacturing jobs as a Fortune 500 behemoth—especially if the smaller companies are using robots.

It's also a safe bet that Asia will fight to win back those smaller companies. It will likely do this not by lowering prices but by ironing out the procedural kinks that have made offshoring an increasingly dicey proposition. Factories in the Chinese interior will try to prove their reliability, aided by government programs designed to improve the nation's infrastructure. Quality-control regimes will be revamped to decrease the number of lemons that slip onto container ships.

Meanwhile, other countries will continue to offer an alternative to either staying in China or coming home. Vietnam, for example, is trying to position itself as a viable option for Western tech companies, a sales pitch strengthened by the fact that Intel recently opened a 500,000-square-foot factory in Ho Chi Minh City.

But distance will continue to matter, for one simple reason: In dynamic systems such as supply chains, the tighter the connection between nodes, the lower the risk of something going haywire. That risk can be tolerated when the benefits of stretching the connections are too great to ignore. But when those benefits diminish, it's time to consider building a system that is stable by design. And once America's formidable innovation muscle is focused on keeping manufacturing nearby, new and inventive systems for reducing labor costs—without going overseas—will be developed quickly.

After all, it's one thing to gamble on a new design, quite another to entrust your company's fortunes to the whims of a Dongguan factory owner.

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