

# Network of obscure Asian suppliers powers Apple's success

October 3 2012, by John Boudreau

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On a November afternoon two years ago, a taxi pulled up to the gate of Ta Liang Technology, one of countless nondescript companies that make up the global gadget supply chain.

Sitting in the back seat was an American wearing a T-shirt, shorts, sandals and carrying a backpack, looking like a tourist who took a wrong turn in this town south of Taipei that has few English speakers. But the passenger's business card needed no translation: Supply Base Engineer, Asia Procurement Operations - Apple.

The unscheduled visit, a glimpse of Apple's global supply chain in motion, set off a scramble. Within minutes, the Apple rep was sipping coffee with Ta Liang's chairman and other executives, who were presented with a technological challenge that could lead to a sizable contract.

Apple's massive supply chain is what enabled the record-breaking rollout of the [iPhone 5](#) in September; more than 5 million units were sold by the end of its first weekend. While the Cupertino, Calif.-based company outsources component production to numerous corners of the globe, Taiwan is at the center of the Apple manufacturing ecosystem.

The island is packed with aggressive and nimble companies vying to provide under-the-cover but critical technology that ensures that Apple's [latest gadgets](#) arrive on the global stage by the millions at Apple's command. And Taiwan's importance is apt to grow if Apple shifts the

production of its iPhone chips from Samsung, with whom Apple is engaged in a patent war, to Hsinchu-based [Taiwan Semiconductor Manufacturing](#), which industry insiders here believe will happen soon.

"Apple's supply network is perhaps the most sophisticated in the world," said Creative Strategies President Tim Bajarin.

Many people have heard of Taiwan-based Foxconn, whose factories across China employ more than a million workers to assemble everything from MacBooks to iPads. But it is off-the-radar-screen companies like Ta Liang that Apple consistently relies on to figure out hard-to-solve production problems on tight deadlines. A contract with Apple can send a supplier's stock share soaring - or even represent most of its revenue.

But working with Apple is not easy. Its engineers are uncompromising, and it imposes a code of silence enforced with financial penalties for product leaks. And its history of cutting suppliers in a heartbeat helps create a "love-hate relationship" between Apple and the companies that build its products, said Stephen Su, general director of Taiwan's Industrial Technology Research Institute, who used to work for a company that supplies camera modules for iPhones, iPads and [MacBooks](#).

"Apple does not co-invest in a new technology with a supplier," he said. "And they are not patient. 'Can you do it? If not, I will go to another supplier.' "

Still, when the world's undisputed leader in consumer technology comes calling, company executives often order their engineers to work around the clock.

Initially, Ta Liang executives were aghast at Apple's specifications. They were handed flexible, folding panels made of fiberglass and told to make

them without the slightest rough edge or blemish - even though consumers would not see them because they would be covered with another material.

"That made it almost impossible," recalled Jerry Chen, president of the 325-employee-company, which builds sophisticated machines weighing 12 tons each that are used to create tech components such as circuit boards for iPhones and other devices. A week later, however, Chen invited the Apple rep back for another coffee - and the proud unveiling of a machine that had been configured to seamlessly make the cuts Apple wanted.

"We took him to our factory to see the production," Chen said. "He used his hand to check out the cut. 'Oh, wonderful!' he said."

Apple ordered 21 machines from Ta Liang to produce the world's first iPad covers.

"He never told me what the product was for," Chen said. "It wasn't until after Steve Jobs announced it that I saw what it was for."

According to a report Apple released earlier this year, the company relies on 156 official product and components suppliers, about a third of which are based in Taiwan. But the report doesn't include companies like Ta Liang Technology, which says about 20 percent of its business is derived from building sophisticated factory machines that produce Apple products. Nor does it include TeamChem, a 17-employee startup also in Bade that makes chemical coatings for circuit boards for Foxconn.

"We are just a tiny screw in the machine," said Todd Yeh, TeamChem chairman.

But the small "screw" remains on Apple's radar screen. An Apple engineer called to inquire about TeamChem's new conductive adhesive technology that, among other things, would allow chips to be mounted directly on an iPhone circuit board, eliminating the need for tiny sockets. This would lower manufacturing costs, increase the speed at which the devices roll off assembly lines and allow them to be even thinner. The adhesive, which has yet to be mass-produced, could also be used on flexible circuit boards for future devices with flexible panels.

As long as Apple remains on top, companies will do just about anything to work with it, Su said.

He recalled traveling to Cupertino, Calif., a few years ago to make a product proposal. He arrived at San Francisco International Airport from Taipei in the afternoon, drove to Apple's campus for a one-hour meeting, then returned to SFO for a midnight flight back to Taiwan - a common practice among suppliers.

"For us, time is money," said Su, who declined to say what product his former company was talking with Apple about.

Apple's willingness to cut suppliers loose on a moment's notice could ultimately damage the company's [global supply chain](#) should it lose its competitive edge, Su said. If that were to happen, many suppliers might first line up behind other companies with whom they have enjoyed long-term relationships, potentially making it more difficult for Apple to find partners, he said.

For now, though, Apple calls the shots. And suppliers willingly follow.

Working with Apple, Bjarin said, "raises their status immeasurably. If they are a supplier to Apple, they are considered a first-rate manufacturer."

In the third quarter last year, Ta Liang's Chen received an email from the Apple representative who visited his company. He wanted to know if the company could create a new metal cover for what most likely would be the iPhone 5. Once again, Apple's request required extraordinary efforts.

"They wanted it cut perfectly smoothly," Chen said. In the end, "It was too difficult for us," he said.

Still, he eagerly anticipates the next call: "We are always serious about [Apple](#)."

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