

Massive chip consolidation wave is changing semiconductor industry

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A wave of mergers and acquisitions is reshaping Silicon Valley's semiconductor industry as companies join forces to shoulder the soaring technology costs required to stay competitive.

Half a dozen chipmakers in Silicon Valley, including a few storied names, have changed hands in less than two years in nearly \$12 billion in [mergers and acquisitions](#) affecting thousands of employees and costing some their jobs. In one merger 1,600 people are being laid off.

"The net winners are investors. The net losers are the employees who lose their jobs," said Betsy van Hees, an analyst with Wedbush Securities.

In the biggest deal yet, Singapore-based Avago Technologies, which bought Silicon Valley's LSI a year ago, announced Thursday that it will acquire Broadcom, an Irvine-based chip maker and major supplier of integrated circuits for the [mobile phone industry](#), for \$37 billion in a cash and stock deal. The acquisition will create a \$77 billion company, Avago said. While it is incorporated in Singapore, Avago - a spinoff of Hewlett-Packard's semiconductor operation that went public in 2009 - says it is "co-headquartered" in San Jose.

With that announcement, key industry mergers and [acquisitions](#) pending or completed, including companies not in the valley, totaled more than \$60 billion during the same period.

The targets of all this activity make a variety of specialty chips for industrial, automotive, mobile and storage applications and include valley companies Volterra Semiconductor, LSI, Omnivision Technologies, Integrated Silicon Solution Inc. (ISSI), Spansion and Silicon Image.

"We're at a point where the cost of being at the leading edge is becoming prohibitive for all but the largest semiconductor companies," said Mark Hung, an analyst with the technology research firm Gartner. Hung said it can cost \$100 million to produce a leading edge chip. "It's very different from decade ago, when you could get a viable chip done with \$10 million to 30 million dollars," he said.

"Even fairly big companies really cannot afford to stay ahead of their competitors. That's why you're seeing this wave of mergers and acquisitions," he added.

Chipmakers are dealing with the increasing expense of producing their devices as transistors sink toward the size of a few atoms, while at the same time getting ready for an expected wave of new applications for the Internet of Things and its billions of connected devices, analysts say.

The industry is still growing, but is undergoing a natural consolidation, said Mike Wyatt, head of global technology mergers and acquisitions for Morgan Stanley. "The semiconductor market is a huge market," said Wyatt. "You really have to be a big player to compete effectively."

Global semiconductor sales were \$335.8 billion in 2014, with \$173 billion of that in U.S. sales, according to the Semiconductor Industry Association.

The \$6.6 billion acquisition of San Jose chip company LSI by Avago started the ball rolling after it was announced in December 2013, said

Raymond James analyst Steve Smigie.

The share price of an acquirer typically drops after the acquisition, but in the case of Avago and LSI, the prices of both companies went up, he said.

"Acquirers are like, 'Hey, investors are going to pay for that now,'" Smigie said.

The growth of the "Internet of Things" has also set off a scramble not to be left behind in what may become a major market for tiny embedded chips and sensors. Mergers can bolster a company's technology.

In just such a deal, Cypress Semiconductor of San Jose merged with Spansion, based in Sunnyvale, in a \$1.6 billion acquisition announced in December. The deal bolstered each company's micro and memory chip offerings for cars, medical and mobile devices, Ernst and Young noted.

But it also triggered a layoff of 1,600 employees. "Everyone has been notified but not all have left yet," said Cypress spokesman Joe McCarthy.

Cypress also is battling to acquire ISSI, which had all but inked a deal to be acquired by a Chinese private equity consortium for \$639.5 million in March. ISSI's largest shareholder, activist hedge fund Starboard Value, expressed "serious concerns" that Cypress was not asked to bid on Milpitas-based ISSI and pushed its board to consider an offer from Cypress. The Chinese deal is on hold while Cypress explores a bid. A Chinese consortium with some of the same members acquired Omnivision, of Santa Clara, for \$1.9 billion in April.

The merging and acquiring is creating some powerful players. The Dutch firm NXP acquired Freescale, an Austin, Texas, semiconductor

company, in an \$11.8 billion deal that will make it a strong player in the Internet of Things.

"That one is going to create a powerhouse," said Jim McGregor of Tirias Research. Competitors "were in shock," he said.

NXP and Freescale said the combination of the two companies was "focused on the high growth opportunities in the Smarter World," another name for the Internet of Things.

Slowing growth for some types of chips is spurring some acquisitions, analysts say. Personal computer sales, which are a big market for Intel's processors, are dropping, and chips for most applications are becoming "good enough," according to Bernstein Research.

"The pursuit of faster processors is gradually running out of steam," the research company said.

That has put Intel - which makes processors for PCs and servers - in acquisition mode. The giant Santa Clara chip company offered \$13 billion for Altera in March, which makes a programmable logic chip finding wider application in server farms. Altera spurned the offer but talks are reported to have resumed.

There's probably more to come before the urge to merge is satisfied. Two of the largest valley semiconductor manufacturers, Maxim Integrated Products and Xilinx, both based in San Jose, are said to be likely acquisition targets for Avago. Maxim is an acquirer itself, having taken over Volterra in 2013 for \$500 million.

Acquisitions also are a way for companies in an industry that is seeing slowing growth to show revenue increases to Wall Street investors, said van Hees of Wedbush Securities

"There's been a lot, and a lot more is going to happen," she said. "The industry will continue to consolidate."

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