SILICON VALLEY'S SEMINAL START-UP

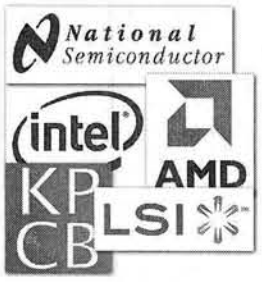
CHIP MAKER SPAWNED AN INDUSTRY — AND A CULTURE

WAYNE MILLER — MAGNUM PHOTOS

Roots

THE START

The Fairchild Eight left the lab of Nobel Prize winner William Shockley to start Fairchild Semiconductor in 1957. Shown three years later, they included, from left, Gordon Moore, C. Sheldon Roberts, Eugene Kleiner, Robert Noyce, Victor Grinich, Julius Blank, Jean Hoerni and Jay Last. The successful chip maker, dubbed "the Google of the era" by venture capitalist E. Floyd Kvamme, helped establish the valley's entrepreneurial legacy.



A LOOK AT FAIRCHILD'S OFFSPRING

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Offspring include Intel, National Semiconductor

By Mark Boslet
Mercury News

During a rare public appearance this month, high-tech pioneer Gordon Moore looked back on a storied career that began when Silicon Valley was still rich with prune and apricot orchards.

"I had the opportunity to get in at the beginning, when the industry was just forming," Moore said of co-founding the seminal start-up Fairchild Semiconductor in 1957. "It was a different era."

While the valley's orchards have given way to urban sprawl and high-tech campuses, the chip-making heritage Fairchild established continues, and the lessons of its founders and early employees remain as relevant as they were five decades ago. More than any other company, Fairchild — which celebrates its 50th anniversary Monday — laid the foundation for the valley to become the global high-tech leader it remains today.

The company "was the Google of the era," recalled venture capitalist E. Floyd Kvamme, who joined Fairchild as a product marketing engineer in 1963. "It was the king down here."

Fairchild was co-founded by Moore, Robert Noyce and six other young scientists and engineers who quickly became known as the Traitorous Eight for their decision to leave Nobel Prize winner William Shockley and his company, Shockley Semiconductor, about a year after being hired. Noyce and

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Legacy

CULTURE OF START-UPS

Former Fairchild employees went on to found more than 20 start-ups, which in turn led to dozens of other companies. They include Intel, the world's biggest maker of computer chips, and Kleiner Perkins Caufield & Byers, one of Silicon Valley's leading venture capital firms.

"Fairchild was the mother of the spin-outs in Silicon Valley."

— T.J. RODGERS, FOUNDER AND CHIEF EXECUTIVE OF CYPRESS SEMICONDUCTOR

INNOVATION ENCOURAGED

Engineers and scientists blazed new technical paths, designing not just transistors but the machinery to make them. Production tools needed to be made from scratch.

"We were making an invention every day."

— JAY LAST, FAIRCHILD CO-FOUNDER

PROGRESSIVE WORK ENVIRONMENT

Ideas flowed and employees were given a great deal of freedom. Co-founder Robert Noyce offered suggestions rather than barked orders. If a worker's proposal was good, the go-ahead was given.

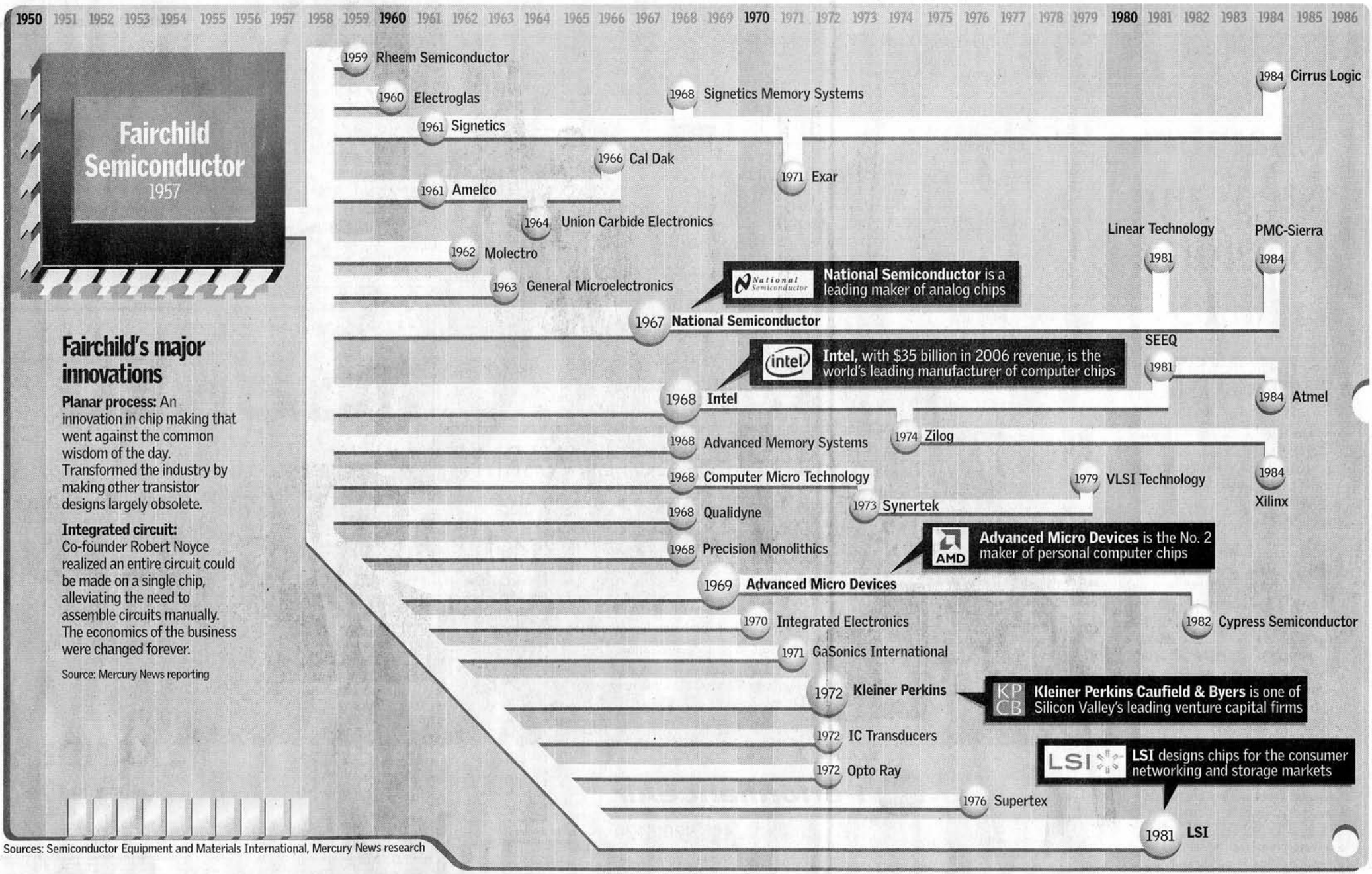
"You could move up very quickly if you were successful."

— BERNARD MARREN, WHO JOINED THE COMPANY IN 1960

FAIRCHILD AT 50

CHIPS OFF THE OLD BLOCK

Fairchild Semiconductor was a seminal company in the creation of Silicon Valley. It and its offspring spawned dozens of high-tech companies, including Advanced Micro Devices, National Semiconductor and Intel.



Fairchild's major innovations

Planar process: An innovation in chip making that went against the common wisdom of the day. Transformed the industry by making other transistor designs largely obsolete.

Integrated circuit: Co-founder Robert Noyce realized an entire circuit could be made on a single chip, alleviating the need to assemble circuits manually. The economics of the business were changed forever.

Source: Mercury News reporting

Sources: Semiconductor Equipment and Materials International, Mercury News research

ROB HERNANDEZ — MERCURY NEWS

Valley's seminal start-up

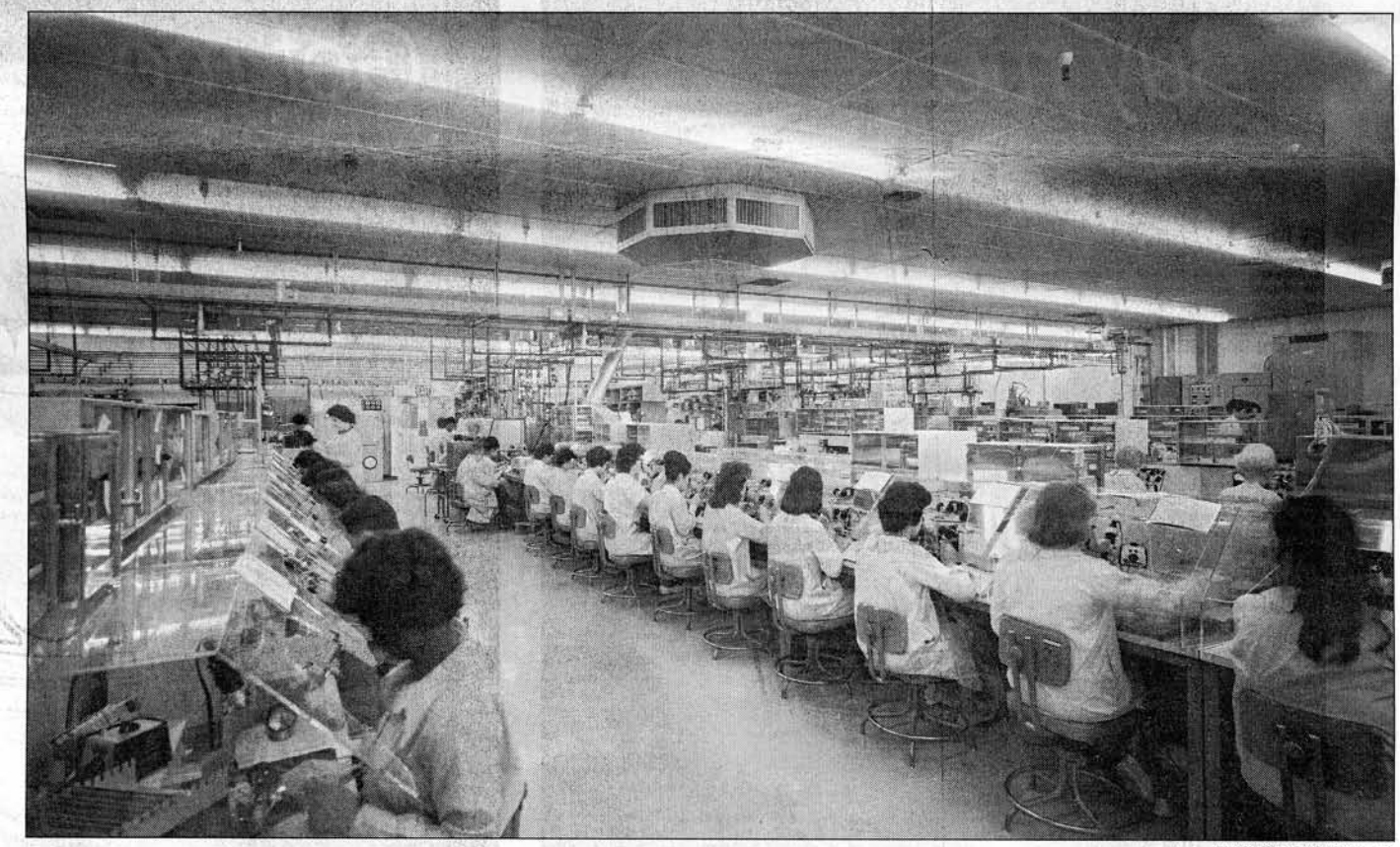
Continued from Page 1A

Moore would go on 11 years later to found Intel.

It wasn't long before Fairchild, which set up shop in Palo Alto but is now headquartered in South Portland, Maine, transformed the industry with its inventions. Several of its innovations for designing and manufacturing chips still rank as among the most important in high-tech history.

But its influence didn't end there. The company helped create the valley's entrepreneurial culture of start-ups and venture capitalists. Its former employees, dubbed "Fairchildren," founded more than 20 start-ups, and the companies they formed spawned dozens more. Among them are National Semiconductor, LSI, Intel and venture capital firm Kleiner Perkins Caufield & Byers.

"Fairchild was the mother of the spin-outs in Silicon Valley," said T.J. Rodgers, founder and chief executive of Cypress Semiconductor of San Jose. Part of the reason was simple. Back then, "everybody knew everybody else."



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The production line of Fairchild Semiconductor is shown in 1964. The company helped create the valley's entrepreneurial culture of start-ups and venture capitalists. Its former employees founded more than 20 start-ups, and those companies spawned dozens more.

Varied skills

From the beginning, Fairchild was a disparate group. Moore was schooled as a chemist and physicist. Cofounder Jay Last studied optics. Swiss-born Jean Hoerni, also a co-founder, had two doctorates in physics, one from Cambridge University. Cofounder C. Sheldon Roberts was a metallurgist.

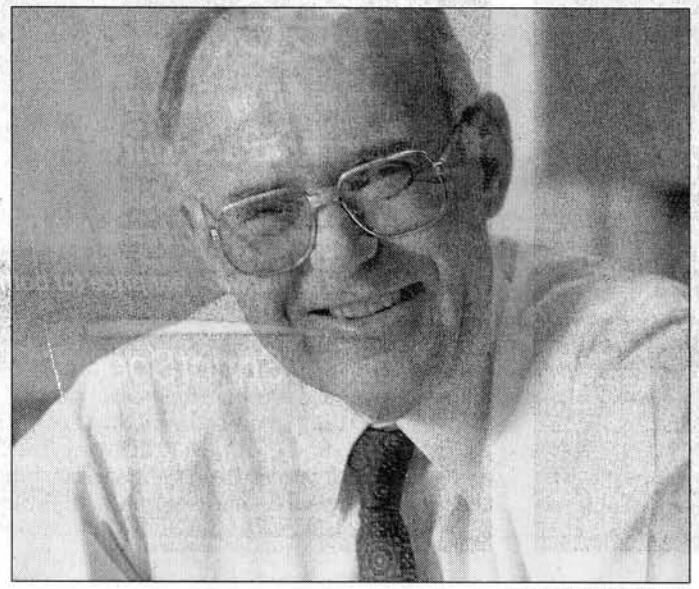
Several years after its founding, Fairchild hired Andy Grove, Intel's former chief executive, to work in its research and development department.

Many former employees say that despite the decades that have passed, their company remains a useful model for start-ups today.

"We were making an invention every day," said Last, 77. "We figured out ourselves the products we wanted to make" and relied on the sales force to identify potential customers.

Today, most businesses start with venture capital, which "didn't exist then," Last noted. But the business goals are unchanged. "Nobody pays you for being clever," he said. "They pay you to satisfy some need they've got. An awful lot of inventing is figuring out what you want to do."

With little venture funding to rely on, Fairchild got its start with $1.38 million it raised from Fairchild Camera and Instrument of Syosset, N.Y. In exchange, Fairchild Camera and Instrument retained an eight-year option to buy the company, which it exercised in 1959. The company was sold to Schlumberger in 1979 and then to National Semiconductor in 1987 before becoming a separate public company in 1999.



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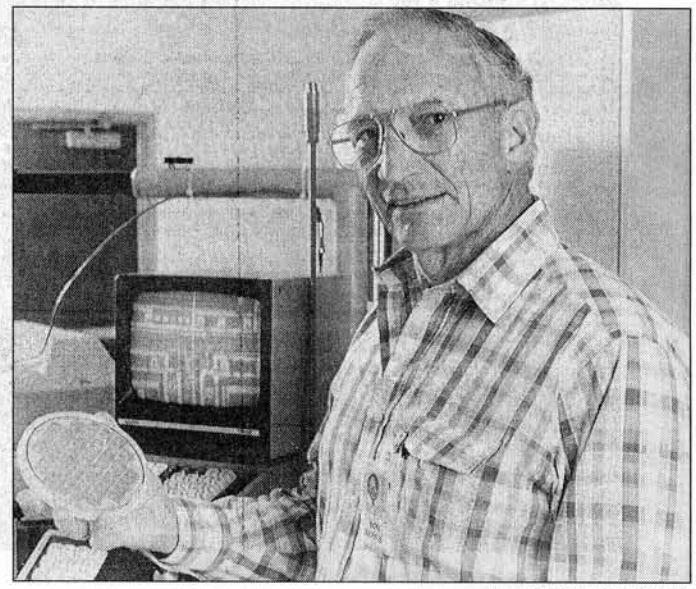
Gordon Moore, shown in 1989, was co-founder in 1957 of Fairchild Semiconductor and, 11 years later, Santa Clara chip maker Intel.



ASSOCIATED PRESS ARCHIVES

Robert Noyce was one of eight young scientists who co-founded Fairchild Semiconductor. He co-founded Intel with Gordon Moore.

At its peak in the mid-1960s, Fairchild was one of the largest producers of silicon transistors and controlled 30 percent of the market for integrated circuits, according to the Computer History Museum in Mountain View. It was in those heady days that Moore came up with his famous Moore's Law, a prediction that the numbers of transistors on a computer chip would double every two years. More than four decades later, his law still holds true.

Major inventions

Fairfield's top inventions include its 1959 pioneering of the planar process for producing silicon transistors — a technique that left a layer of silicon oxide on the circuits to protect them from contamination. Until then, it was believed the oxide had to be removed for the circuit to work.

Weeks later, Noyce built on the planar invention with a second monumental breakthrough: He imagined an integrated circuit, or an entire circuit on a single chip. By evaporating a coating of metal on the planar layer and etching in wires, Fairchild connected previously unconnected circuits, allowing them to work together and greatly increasing their utility.

The pair of innovations didn't just permit chips to be made more easily and inexpensively; they also made other transistor designs of the day largely obsolete.

"Until we came along, transistors were made one at a time," Last said. "We started making wafers with a lot of transistors on them. It was a batch process."

Fairchild pioneered a hard-charging business plan as well, said Jerry Sanders, who joined the company in 1961 as a district sales manager and left as worldwide director of marketing in 1968. Its "no surrender, no retreat" way of doing business is just as relevant today as it was then, said Sanders, 71, who went on to co-found Advanced Micro Devices in 1969.

Building a company requires speed, risk taking and sometimes swinging for the fences, he said. And "it goes back to the mantra: 'How are you different; how are you better?' " he added.

"You've got to be bold," Sanders said. "Fortune favors the brave."

The early days of the chip industry were fraught with uncertainty. "There were a lot of questions about integrated circuits," Moore said. "There were a lot of arguments why they didn't make sense."

Some people thought they wouldn't be reliable. Others questioned whether manufacturing lines could produce enough defect-free chips.

Fairchild plunged ahead. Noyce argued that Fairchild should sell integrated circuits for less than the initial cost of their components, Moore said. It was a radical idea. The plan was to make a profit as volume rose and costs fell.

Despite its success, Fairchild wasn't all hard work and drudgery. It was an open work environment with a free flow of ideas and, sometimes at the end of the workday, a free flow of drinks at the Wagon Wheel in Mountain View.

'A lot of freedom'

"Fairchild was very, very progressive," said Bernard Marren, who joined the company's engineering department three years after its founding. "They were very trusting. They gave you a lot of freedom." If an idea made sense, the go-ahead was given.

"You could move up very quickly if you were successful, and get fired very quickly, too," said Marren, who now is chief executive of Opti in Palo Alto.

One Fairchild mistake, many former employees say, was not issuing stock options to key workers in its early days. Eventually, many left for what they considered better opportunities.

"I don't think (the company) understood the significance of what it had," Marren said.

Today, technology moves at a faster pace and the valley — in the era of the Internet — is much more diverse. The days when a start-up like Fairchild had to build everything from scratch — from production tools to design technologies — are gone.

But the entrepreneurial spirit is not. "I don't think start-ups have changed," said Marren, "but how they are implemented is different."

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