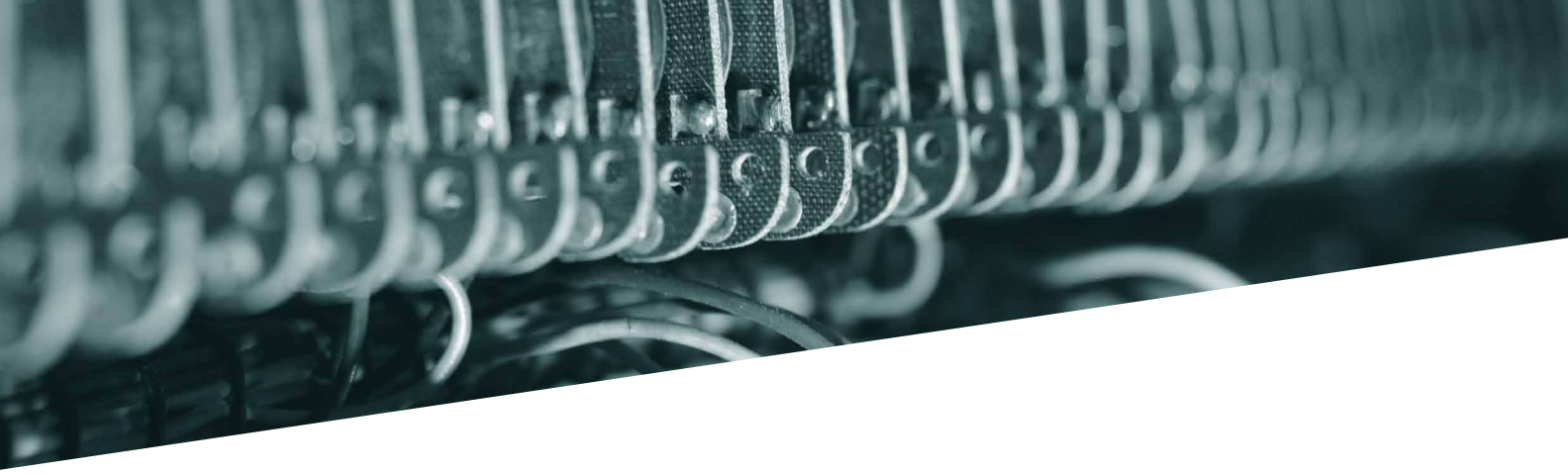

HOW DID SILICON VALLEY BECOME SILICON VALLEY?

Three Surprising Lessons for Other Cities and Regions

a report from:

ENDEAVOR INSIGHT

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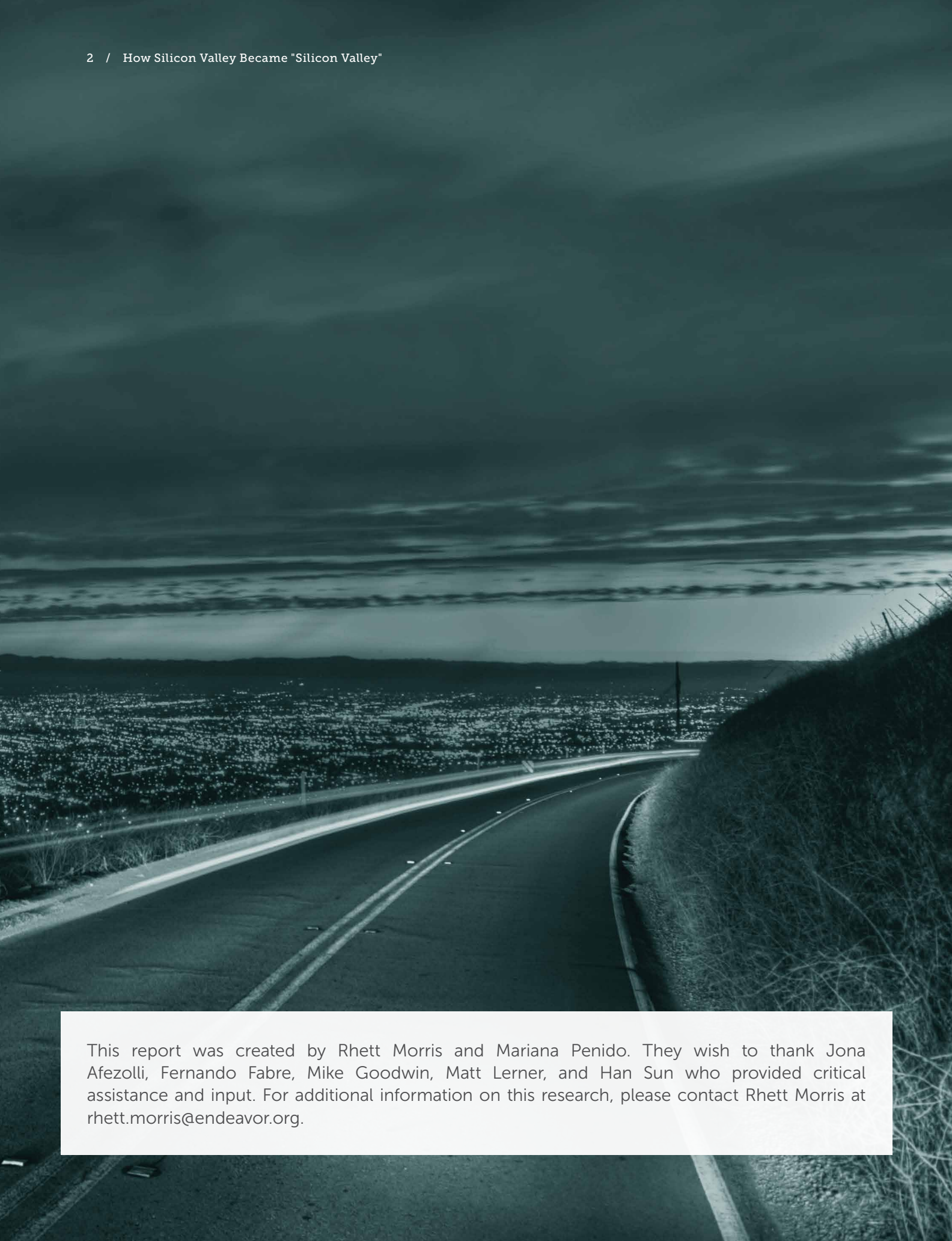


This report was created by Rhett Morris and Mariana Penido. They wish to thank Jona Afezolli, Fernando Fabre, Mike Goodwin, Matt Lerner, and Han Sun who provided critical assistance and input. For additional information on this research, please contact Rhett Morris at rhett.morris@endeavor.org.

INTRODUCTION

THE JOURNALIST Don Hoefler coined the term "Silicon Valley" in a 1971 article about computer chip companies in the San Francisco Bay Area.[1] At that time, the region was home to many prominent chip businesses, such as Intel and AMD. All of these companies used silicon to manufacture their chips and were located in a farming valley south of the city. Hoefler combined these two facts to create a new name for the area that highlighted the success of these chip businesses.

Silicon Valley is now the most famous technology hub in the world, but it was a very different place before these businesses developed. When the computer chip industry was emerging in the mid-1950s, there were no venture capital investors in the area.[2] Stanford University did not produce any research on computer chip components and the supply of local employees qualified to work with these high-tech devices was almost nonexistent.[3] The Bay Area was far behind cities like Boston and New York in the chip industry.[4] No one expected the region to become a hub for these technology companies.

Silicon Valley's rapid development offers good news to other cities and regions. This report will share the story of its creation and analyze the steps that enabled it to grow. While it is impossible to replicate the exact events that established this region 50 years ago, the development of Silicon Valley can provide insights to leaders in communities across the world. Its story illustrates three important lessons for cultivating high-growth companies and industries:

1. Great companies can develop in unlikely and challenging places.
2. A few entrepreneurs can make a large impact.
3. There is a framework for success that leaders can accelerate.

Lessons for Cultivating High-Growth Companies & Industries

1. GREAT COMPANIES CAN DEVELOP IN UNLIKELY AND CHALLENGING PLACES.

Innovative businesses can start up and become successful in cities and regions that are far from ideal.

2. A FEW ENTREPRENEURS CAN MAKE A LARGE IMPACT.

A very small group of successful founders has the power to spawn many companies that create thousands of jobs.

3. THERE IS A FRAMEWORK FOR SUCCESS THAT LEADERS CAN ACCELERATE.

New companies can develop rapidly when local entrepreneurs follow a cycle that supporters can speed up.

PHOTO ON COVER: FLICKR USER MICHAEL KAPPEL • PHOTO ON LEFT: A RECENT VIEW OF SILICON VALLEY AT NIGHT BY FLICKR USER PETERTHOENY

The San Francisco Bay Area was a very difficult place for the first computer chip entrepreneurs.

THE BEST WAY to understand Silicon Valley's success is to follow the story of its creation. This story begins thousands of miles from the Bay Area in a laboratory where scientists developed the first computer chip technology.

▶ A GROUNDBREAKING INVENTION. In the late 1940s, a team of physicists at an AT&T research center in New Jersey created the transistor, a new "semiconductor" device that could control and amplify electric signals.[5] The transistor quickly began to replace other signal processing technologies. It became so important that its three inventors were awarded the Nobel Prize.[6]

In 1955, one of these inventors, a MIT-trained scientist named William Shockley, decided to leave the laboratory and start a company that produced transistors.[7] Shockley considered locating his company in Boston or Southern California, but he eventually chose to return to the place where he grew up.[8] In 1956, he started his new business in Mountain View, a small town in a farming valley 50 miles south of San Francisco.[9]

Farm workers drying prunes near Mountain View.

▶ A REGION FULL OF CHALLENGES. Shockley's decision was quite surprising. As the chart on the opposite page illustrates, the San Francisco area was far behind cities like Boston and New York in the the computer chip industry.[10] Research has also shown that building a successful company requires access to three things — financing, customers, and employees — that were in short supply for startups like Shockley's.[11] In the mid-1950s, there were no venture capital firms in the Bay Area.[12] The U.S. military often acted as the main funder and customer of high-tech companies.[13] However, at that time only a small portion of the military's startup capital and sales contracts went to electronics firms in and around San Francisco.[14] The Bay Area wasn't even the leader in its own state; Los Angeles and San Diego both received more funding for high-tech research and production.[15]

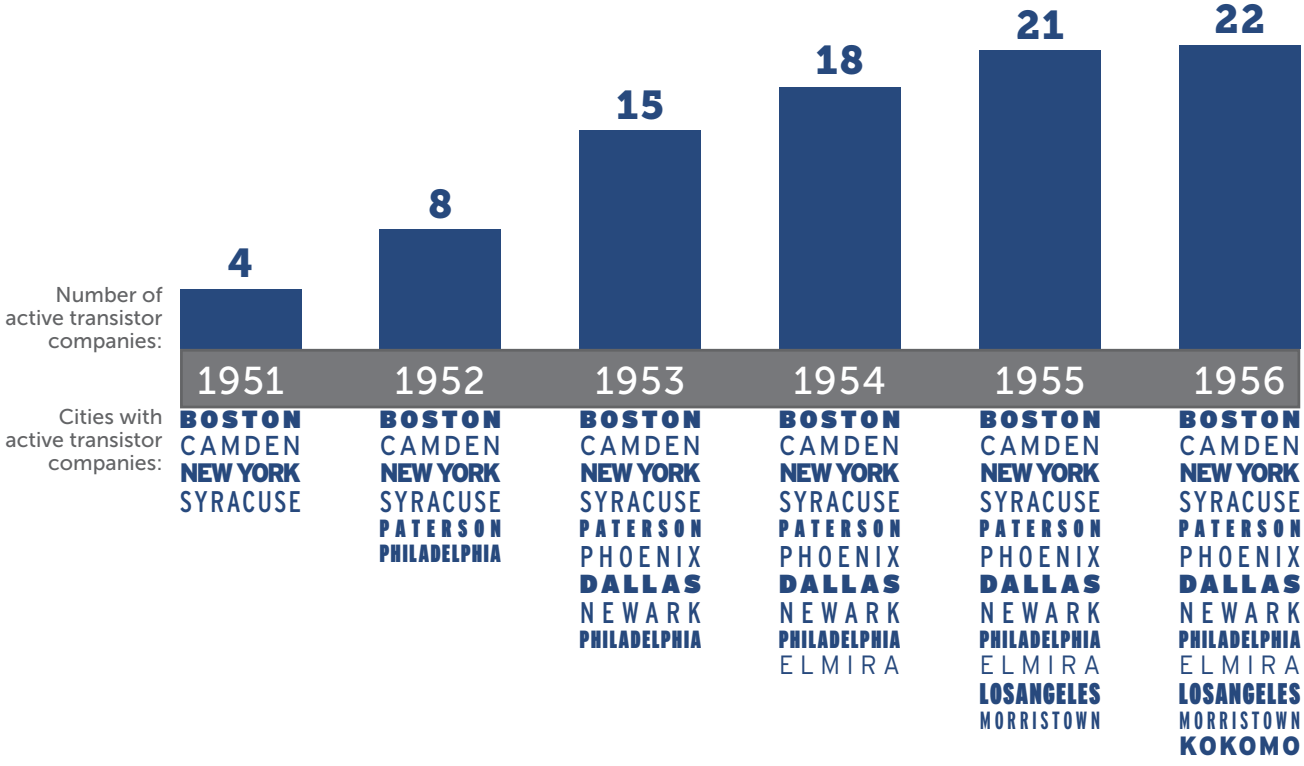
It was also difficult to find talented employees since engineers with semiconductor expertise were concentrated in cities that already had transistor companies. The Bay Area did have a small cluster of tech firms, but these companies worked with technologies that were very different from those in the transistor.[16] As a result, their employees lacked the knowledge Shockley required.

Stanford's engineering program was also quite small. Fewer than 20 engineering PhDs graduated from the school the year Shockley started his firm.[17] These graduates had little to no experience working with transistors since Stanford did not have a semiconductor lab.[18] In addition, strict immigration policies prevented local entrepreneurs from accessing talent from other countries.[19] In the 1950s and 1960s, immigrants made up less than 10% of the area's population — the lowest level in the last 150 years.[20]

PHOTO AT CENTER: FLICKR USER CAMPBELL HISTORICAL MUSEUM & AINSLEY HOUSE

DEVELOPMENT OF THE COMPUTER CHIP INDUSTRY'S FIRST TRANSISTOR COMPANIES

Many cities were far ahead of the Bay Area.



Sources: Tilton, 52. Klepper 79-116; Endeavor Insight analysis.

▶ **THE VALLEY'S FIRST FAILURE.** Shockley worked hard to overcome these challenges. He secured financing from an investor outside the Bay Area, but talent was more difficult to find.[21] He offered jobs to his former co-workers at AT&T's research lab, but they refused to move to the region.[22] (The local area was so rural that it lacked long distance telephone service.[23]) Researchers at RCA, another leading transistor company, also turned him down.[24]

Since he could not hire experienced employees, Shockley tried to recruit the best young talent that was available. He placed ads in academic journals and traveled across the U.S. to meet graduate students.[25] This search yielded eight promising researchers and engineers who formed the core of his new firm. They included three PhDs from MIT in Boston, a PhD and a professor from CalTech in Southern California, two engineers from the New York area, and one local PhD from Stanford.[26]

These men were quite young — their average age was 30.[27] Each was also hungry for new opportunities, which Shockley could provide. "It was like picking up the phone and talking to God," said Robert Noyce, one of the MIT PhDs. "He was absolutely the most important person in semiconductor electronics."[28]

Although the company had a great team, it faced major problems before it could pursue customers. Shockley turned out to be a terrible boss.[29] He insulted employees and was so paranoid that he once ordered his entire staff to take polygraph tests.[30] These actions doomed his business. After just one year, all eight of the employees Shockley had worked so hard to recruit resigned on the same day.[31]

Shockley's company would shut down a few years later. The departure of the eight researchers weakened the firm to a point from which it could not recover. It also left a key question unanswered: was it even possible to build a competitive computer chip company in the Bay Area?

A small group of ambitious entrepreneurs created the first successful chip company in the Bay Area.

▶ **A NEW BEGINNING.** Arthur Rock was a young banker working in New York when a colleague handed him a letter that would reshape the computer chip industry. It came from Eugene Kleiner, one of the eight employees leaving Shockley's company.

"If suitable backing can be obtained, the present group can reasonably expect to take with them other senior people," the message read. "We believe that we are much more valuable to an employer as a group. We have an experienced and well-diversified group of men with background in the fields of physics, electronics, engineering, metallurgy, and chemistry."[32]

The eight men leaving Shockley wanted to continue working together to make transistors, but no other companies in the San Francisco area produced the devices.[33] Kleiner's father had contacts at the bank where Rock worked. Kleiner reached out to the bankers there because he hoped they could find an East Coast transistor company that would hire the men leaving Shockley as a team. The eight researchers had sacrificed promising careers to work together in this new industry. Most of them had moved their families a great distance. They weren't ready to give up.

Rock quickly recognized the group's potential. "They had all been chosen by Shockley, so I knew they were probably pretty good people, and then when we met them I was very impressed," he said. However, Rock thought the group should stop looking for an employer and think much bigger. "I suggested to them that they might want to set up a company, and we told them we would see if we could get financing."[34]

▶ **TWO SUPPORTERS MAKE A DIFFERENCE.** The New York banker worked hard to convince the researchers and engineers to launch their own firm. The team appreciated the quality of life in Northern California and had started to put roots down in the area, which made them willing to give it a try.[35] "We all owned our own houses then," remembered Gordon Moore, who was one of the eight researchers. "It was a heck of a lot easier than going out looking for another job."[36]

Unfortunately, it was more difficult than expected to find financing for a transistor company located in the Bay Area. Rock approached more than 35 potential investors and was rejected every time.[37] He was about to stop searching when someone introduced him to a serial entrepreneur in New York named Sherman Fairchild. Fairchild agreed to fund the new company as an independent business associated with Fairchild Camera & Instrument (FC&I), an electronics firm he led.[38] The eight co-founders named their company "Fairchild Semiconductor" and opened for business in Palo Alto in October of 1957.[39]

▶ **THE NEW FIRM TAKES OFF.** Thanks to Shockley's recruiting and Rock's fundraising, the entrepreneurs had plenty of talent and financing. All they needed were customers. Fortunately, Sherman Fairchild was well connected in the electronics industry. He introduced the co-founders to executives in the sector and helped them sign their first contract with IBM.[40] This relationship gave them credibility with other large clients. Military sales soon followed, including a prestigious contract to supply components for the government's new intercontinental missile program.[41]

The entrepreneurs soon grew more ambitious. They began to develop integrated circuits with greater processing power.[42] At the end of their third year, Fairchild's annual revenues were over $20 million.[43] By the mid-1960s, the group was generating $90 million in sales and was the second largest competitor in the chip industry.[44] Yet this was only the beginning of the co-founders' accomplishments.

PHOTO ON RIGHT: FLICKR USER WONDERLANE

TIMELINE OF FAIRCHILD SEMICONDUCTOR'S GROWTH AND ACCOMPLISHMENTS

1956 — The eight co-founders met when they left their jobs to join Shockley Semiconductor. Most were new to the Bay Area.

BOSTON

JAY LAST
Co-Founder
Previously earned a PhD at MIT

ROBERT NOYCE
Co-Founder
Previously at Philco; earned a PhD at MIT

SHELDON ROBERTS
Co-Founder
Previously at Dow; earned a PhD at MIT

NEW YORK

JULIUS BLANK
Co-Founder
Previously at Western Electric

EUGENE KLEINER
Co-Founder
Previously at Western Electric

LOS ANGELES

JEAN HOERNI
Co-Founder
Previously a professor at Caltech

GORDON MOORE
Co-Founder
Previously earned a PhD at Caltech

PALO ALTO

VICTOR GRINICH
Co-Founder
Previously earned a PhD and conducted research at Stanford

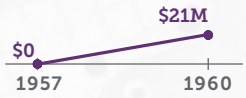
1957 — The co-founders resigned and launched Fairchild Semiconductor with help from two key supporters who provided funding and connections to early customers like IBM.

ARTHUR ROCK
Banker
Hayden, Stone & Co.

SHERMAN FAIRCHILD
Investor
FC&I

1959 — The co-founders signed a contract to supply components to the new Minuteman missile program.

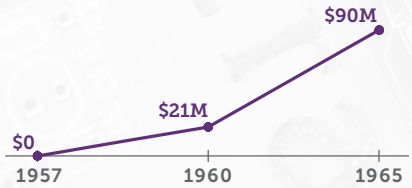
1960 — Fairchild recorded sales of $21 million and was the eighth largest player in its industry. The company also began production of the first integrated circuit.



$21 MILLION IN ANNUAL SALES

1963 — The company became the number three player in its industry and opened its first overseas assembly plant in Hong Kong.

1965 — Fairchild Semiconductor recorded sales of $90 million.



$90 MILLION IN ANNUAL SALES

1966 — The company ranked second in its industry and employed over 4,000 people.

Sources: Lecuyer 121, 131-149, 159-162, 204-207; Tilton 66; Endeavor Insight analysis.

These successful entrepreneurs reinvested their resources into new companies to help spawn Silicon Valley.

ALTHOUGH IT IS POSSIBLE to find great companies like Fairchild in unlikely places, it is rare to see those firms establish an entire local industry. However, this is exactly what happened in the Bay Area.

▶ **FAIRCHILD STARTS TO MULTIPLY.** The expansion of the local computer chip industry began when Fairchild employees were inspired by the eight co-founders and left the firm to launch "spin-off" businesses. In 1959, the firm's general manager left to start Rheem Semiconductor.[45] Two groups of employees resigned a few years later to found the computer chip firms Signetics and Molectro.[46]

These actions had a significant impact on the people still working at Fairchild. "You got these guys leaving and starting companies and the companies are running, working," a former manager said. "You get a look around and look in the mirror and say, 'Well, you know, how about you? What are you going to do?'"[47]

The eight co-founders committed their time to supporting many of these ambitious new businesses. For example, when an employee was considering starting a company to make the glass components that Fairchild used in its manufacturing process, Kleiner encouraged him to launch the new firm.[48] Noyce and another co-founder named Jean Hoerni also served on the board of Applied Materials, an electronics equipment firm, and mentored the company's young entrepreneur.[49]

▶ **MORE NEW FIRMS EMERGE.** Employees were not the only ones leaving Fairchild Semiconductor. The company's success led Sherman Fairchild to exercise a buyout clause in his investment contract and make the semiconductor firm a fully owned subsidiary of FC&I.[50] The sale made the eight co-founders rich, but it wasn't long before many of them returned to entrepreneurial careers.

"That experience of starting this company and watching it grow — I thought I'd like to do that again," recalled Jay Last, one of the co-founders.[51] In 1961, he partnered with Hoerni, Kleiner, and another one of the eight entrepreneurs to create Amelco, a new business that produced specialized devices that Fairchild did not sell.[52] Moore and Noyce resigned several years later to start Intel, which eventually became the most successful computer chip company in the world.[53]

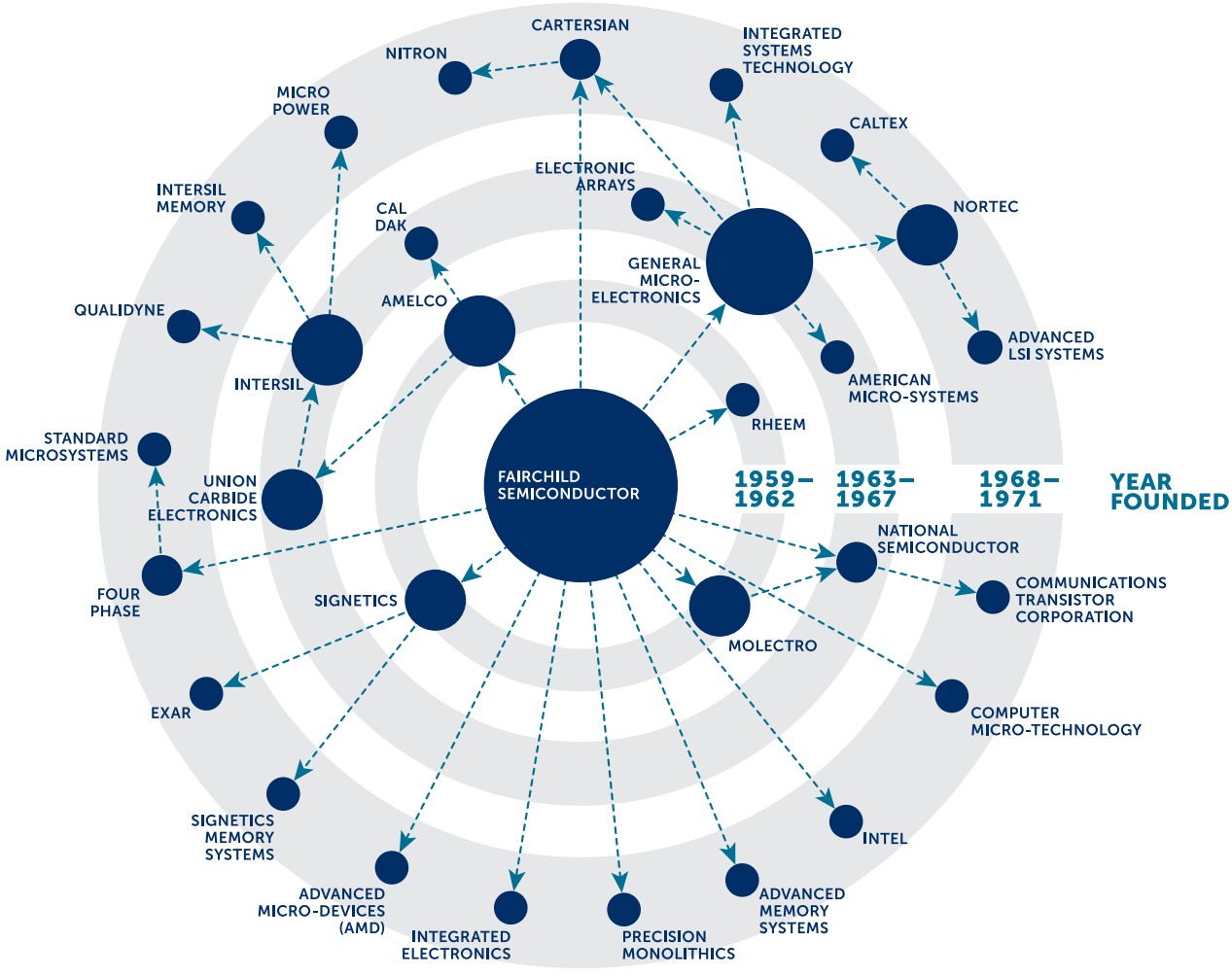
The eight co-founders also reinvested their capital into new startups. In 1961, four of them gave Rock funding to start the Bay Area's first venture capital firm, which went on to invest in fifteen companies.[54] Another founder provided financing that helped a former employee launch AMD.[55] When Moore and Noyce started Intel, the other six co-founders of Fairchild Semiconductor all helped to fund the new business.[56]

"That's part of the legacy of Fairchild that maybe doesn't get the attention it should," Moore has said. "Every time we came up with a new idea, we spawned two or three companies trying to exploit it."[57]

▶ **THE FAIRCHILD VALLEY.** The commitment of the eight entrepreneurs to reinvest their knowledge and capital into these newly spawned companies transformed the local community. When Fairchild Semiconductor won its first contract in 1958, it was the only company in the area producing computer chips or their components. By the time that Hoefler

THE CREATION OF SILICON VALLEY: GROWTH OF THE LOCAL COMPUTER CHIP INDUSTRY

Fairchild generated 31 spinoff firms in just 12 years.



Legend:

Size of circle reflects the influence of the entrepreneurs at each company based on the number of spinoff firms.

SPINOFFS

Sources: SEMI; Hoefler; Endeavor Insight analysis.

wrote the article that coined the name "Silicon Valley" less than 14 years later, over 30 spin-off companies had emerged out of Fairchild.[58] In fact, according to Hoefler's analysis, every local chip firm except for two could be traced directly back to the eight co-founders.[59] The thriving industry that grew out of Fairchild had a huge effect on the region. By 1970, the area was no longer just a farming community. Chip businesses in the Valley employed a total of 12,000 people.[60]

The process of Silicon Valley's creation can be illustrated by a cycle with four steps: ambition, growth, commitment, and reinvestment.

THE SUCCESS of the computer chip companies that made up Silicon Valley was no accident. The actions of Fairchild's eight co-founders established a pattern that was repeated by new companies in the industry. This pattern is not unique to the Valley. Our team at Endeavor Insight has observed it in many other successful entrepreneurship communities. We refer to this process as the "Entrepreneurship Acceleration Cycle." It has four steps:

▶ **STEP ONE: AMBITION** The cycle begins when entrepreneurs seek to build large, scalable businesses in their local communities. To do this, they must have a strong desire to grow and a preference for living in the local area. Fairchild's co-founders demonstrated both of these qualities when they took Rock's advice and launched their company in Mountain View. It is important to note that ambitious entrepreneurs like this are quite rare. Studies in the U.S. have shown that the vast majority of small business owners do not want their companies to grow at all.[61]

▶ **STEP TWO: GROWTH** The second step of the cycle occurs when ambitious founders achieve significant growth at their companies. This requires them to have access to talent, financing, and customers. They must also possess the ability to put these resources to use. Kleiner, Noyce, and the other entrepreneurs at Fairchild, had a tremendous amount of talent among their founding team. Rock's work helped them access funding and Sherman Fairchild connected them to their first customers. The entrepreneurs took these resources and grew their company to reach $20 million in sales in just three years. By 1966, it was the second largest competitor in its industry.

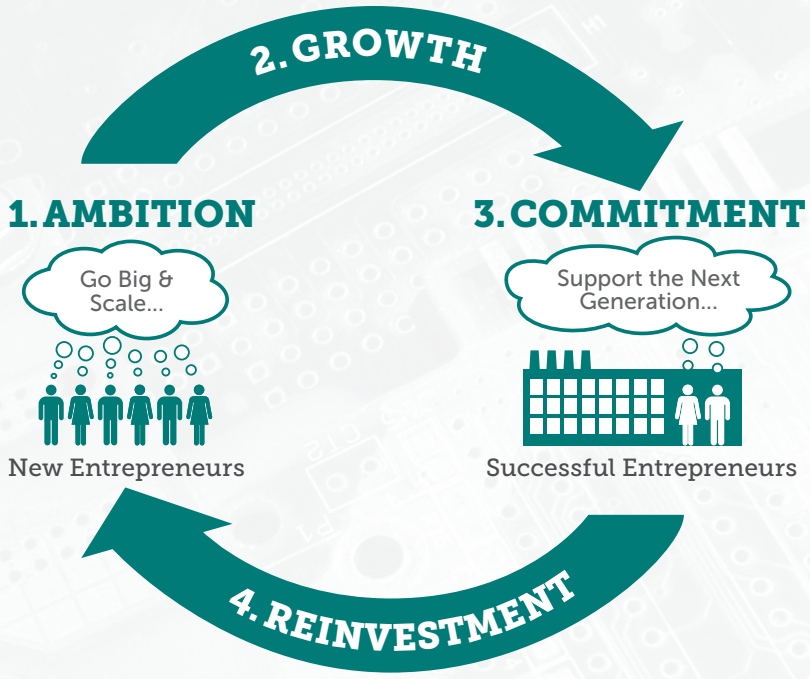
▶ **STEP THREE: COMMITMENT** The eight co-founders could have used the money they received from the buyout of their company to leave the San Francisco area and enjoy an early retirement. Fortunately, they chose a different path. Instead of retiring somewhere else, the entrepreneurs stayed in the Bay Area and dedicated themselves to supporting new companies. This commitment is an example of the third step in the Entrepreneurship Acceleration Cycle, which requires successful founders to have the desire to stay in their local area and share their resources with the next generation of entrepreneurs.

▶ **STEP FOUR: REINVESTMENT** The final step of the cycle occurs when founders of successful companies are able to reinvest in other entrepreneurs and businesses. The leaders at Fairchild demonstrated the different ways this can happen. They inspired employees to start new companies and launched their own spin-off businesses like Amelco and Intel. The eight co-founders were early investors in the first venture capital firm in the Bay Area and in new companies such as AMD. They also mentored other local computer chip entrepreneurs.

These actions helped a new generation of ambitious companies capitalize on Fairchild's success. As these new firms began to repeat the cycle, the support of Fairchild's co-founders provided access to resources, which helped this second generation of companies to grow. This growth rapidly expanded the local computer chip sector and made the Bay Area one of the industry's largest hubs.

PHOTO ON RIGHT: FLICKR USER WONDERLANE

THE ENTREPRENEURSHIP ACCELERATION CYCLE



The Four Steps & Sub-Components of the Cycle:

1. AMBITION	2. GROWTH	3. COMMITMENT	4. REINVESTMENT
New entrepreneurs seek to build scalable companies in the local area due to:	Entrepreneurs are able to grow their companies and reach scale based on:	Successful entrepreneurs stay in the local area & engage with new companies due to:	Successful entrepreneurs reinvest in the next generation through:
Local quality of life	Access to customers	Local quality of life	Angel & VC investing
	Access to financing		Inspiration
Desire to grow	Access to talent	Desire to reinvest	Mentorship
	Entrepreneurial ability		Spinoff businesses

Examples of Ways Local Leaders Can Support Each Step of the Cycle:

- Provide security and amenities that make your local area a great place to live for early-stage founders.
- Recognize fast-growing, early-stage firms in your area to inspire new founders.
- Fund programs and organizations that specifically target fast-growing companies and evaluate these initiatives based on participating companies' growth.

- Eliminate protectionist regulations and subsidies that make it difficult for new companies to win customers from established firms.
- Offer loan and contract guarantees to qualified, fast-growing firms.
- Create job fairs and job boards specifically for local startups and entrepreneurs.
- Establish public-private partnerships and events to attract outside investors to your area.

- Provide security and amenities that make your local area a great place to live for older, successful founders.
- Recognize successful entrepreneurs who reinvest in the next generation of founders by acting as mentors or investors.
- Recruit successful founders to help lead and guide entrepreneurship programs and initiatives in your area.

- Create channels that connect successful entrepreneurs with high-potential, early-stage founders who can benefit from mentorship.
- Offer tax incentives to successful founders who make angel investments.
- Reduce enforcement of non-compete agreements for employees who leave entrepreneurial companies.
- Promote successful entrepreneurs as local role models.

Source: Endeavor Insight analysis.

The pattern of successful founders reinvesting in new firms has led to the growth of over 2,000 companies.

FAIRCHILD'S SUCCESS continued to fuel the growth of Silicon Valley after Hoefler wrote his famous article in 1971. We can observe the company's influence by following the work of Noyce and Kleiner as well as Don Valentine, a former Fairchild executive who became a successful entrepreneur at National Semiconductor.

▶ **THE ENTREPRENEURSHIP ACCELERATION CYCLE CONTINUES.** After launching Intel, Noyce worked to support new entrepreneurs in the Bay Area. When Steve Jobs was starting his career in the 1970s, he often rode his motorcycle to Noyce's house and spent hours listening to the older entrepreneur's advice.[62] (According to Noyce's wife, Jobs also had a unique habit of calling their home around midnight.[63]) Valentine and a former Fairchild employee named Mike Markkula also supported Job's career by providing Apple with its first two investments. Markkula even went on to become Apple's first CEO.

Jobs was not the only entrepreneur to receive funding from Valentine. In 1972, Valentine launched Sequoia Capital, which has become one of the most important venture capital firms in the Bay Area. Its team has invested in Google and Cisco, as well as several hundred other companies.[64] While Valentine was launching Sequoia, Kleiner co-founded another venture firm called Kleiner Perkins that would also become very influential. Kleiner's firm has invested in companies such as Sun Microsystems, Symantec, and Intuit.[65]

The influence of the Fairchild entrepreneurs has continued to expand. Jobs followed Noyce's example of mentorship and quietly advised younger entrepreneurs like Mark Zuckerberg. During Facebook's early years, Jobs would take Zuckerberg on afternoon walks to share his experiences.[66] The venture capital firms of Valentine and Kleiner also funded successful companies like Netscape, and Paypal that spawned a new generation of investment firms like Andreessen Horowitz, Founder Collective, and 500 Startups.[67]

▶ **ADDING UP FAIRCHILD'S IMPACT.** Our team at Endeavor Insight has worked to quantify Fairchild Semiconductor's influence. We identified over 130 Bay Area tech companies that were trading on the NASDAQ or the New York Stock Exchange. Our analysis indicates that about 70 percent of these firms can be traced directly back to the founders and employees of Fairchild.[68] The total impact of these businesses is staggering. These 92 descendants of Fairchild employed over 800,000 people and are now worth more than $2.1 trillion. This means that these 92 companies are more valuable than the annual GDP of Canada, India, or Spain.[69]

If we look beyond publicly traded companies, Fairchild's impact is even greater. In total, we can trace over 2,000 companies back to the firm's eight co-founders. In addition to the companies we have already listed, this group of firms includes eBay, Twitter, Yahoo!, Pixar, Instagram, YouTube, WhatsApp, Oracle, LinkedIn, Tesla Motors, Electronic Arts, Nest, Yammer, Agilent Technologies, Juniper Networks, SanDisk, NetApp, Xilinx, Altera, Palintir, and Linear Technology.[70]

PHOTO ON RIGHT: FLICKR USER WONDERLANE

SILICON VALLEY COMPANIES THAT CAN BE TRACED BACK TO FAIRCHILD SEMICONDUCTOR

Almost 70% of the Valley's public firms are linked to Fairchild.

AAPL GOOG ORCL FB INTC CSCO EBAY YHOO AMAT TSLA

SNDK INTU TWTR LKDN A SYMC XLNX KLAC NTAP LRCX

JNPR EA LLTC ALTR NVDA MXIM NOW SNPS SCTY PANW

SPLK CDNS YELP FEYE ALGN PAY FTNT BRCD UBNT AMD

TIBX SYNA RVBD ZNGA CAVM SNX IDTI FCS FNGN ARUN

ISIL SFLY POWI CUDA CY MPWR MLNX RMBS TRLA PMCS

CODE PFPT MKTO INFN RNG RKUS XOOM AMBA RPXC FUEL

AMCC BLOX EHTH MCRL IMPV HLIT CHGG ISSI EXTR SABA

IXYS QTM PLXT QUIK PSEM MTSN MOSY SPRT IMI ELON

MERU IKAN

THESE 92 COMPANIES REPRESENT MORE THAN

$2.1 TRILLION

IN COMBINED VALUE & OVER 800,000 JOBS.

Note: Companies above are listed by their ticker symbols in descending order of their market capitalization on July 15, 2014.
Source: NYSE, NASDAQ, and Endeavor Insight analysis.

Leaders in other regions and cities can draw three lessons from Silicon Valley's example.

THE STORY of Silicon Valley offers good news to other regions and cities around the world. It illustrates three lessons for leaders who wish to cultivate high-growth companies and industries in their own communities:

▶ 1. GREAT COMPANIES CAN DEVELOP IN UNLIKELY AND CHALLENGING PLACES. When the first computer chip businesses were developing in the mid-1950s, the Bay Area was a difficult place for entrepreneurs in the industry. It did not have large sources of funding, significant pools of talented employees, or major research centers focused on the sector. Cities like Boston and New York had a six year headstart in the industry. Nevertheless, Fairchild managed to develop in the Bay Area and become one of the the most successful computer chip companies.

▶ 2. A FEW ENTREPRENEURS CAN MAKE A LARGE IMPACT. The story of Fairchild also demonstrates how a small number of successful founders can spawn many fast-growing companies. The firm's eight co-founders were directly responsible for the development of over 30 local computer chip companies in less than 14 years. These new firms formed the core of a new local industry that employed a total of 12,000 people.

▶ 3. THERE IS A FRAMEWORK FOR SUCCESS THAT LEADERS CAN ACCELERATE. Silicon Valley's development was fueled by entrepreneurs at Fairchild and other local companies who followed the process outlined in the Entrepreneurship Acceleration Cycle's four steps: ambition, growth, commitment, and reinvestment. This enabled new companies to grow rapidly and eventually produced 92 publicly traded tech businesses that employ 800,000 people and are valued at over $2.1 trillion.

Other cities and regions can use the Entrepreneurship Acceleration Cycle's framework to cultivate the growth of local companies and industries. Our team at Endeavor Insight has analyzed data from hundreds of cities and countries. We have found that every community has at least a small number of fast-growing companies that have the potential to become the Fairchild Semiconductor of their local industries. However, in many cases community leaders do not know that these businesses exist and have no programs in place to support them and cultivate their role in the Entrepreneurship Acceleration Cycle.

Arthur Rock's work with the co-founders of Fairchild demonstrates that even the best entrepreneurs can benefit from assistance. The framework on page 11 highlights ways in which leaders can support local companies and the Entrepreneurship Acceleration Cycle. These examples are drawn from our team's evaluation of over 1,000 entrepreneurship programs and policies, as well as Endeavor's experience working with hundreds of high-growth businesses in 20 countries. Additional examples of supportive policies and programs can be found online at Entrepreneurship Ecosystem Insights (www.ecosysteminsights.org/EAC-programs) or by contacting our team directly at insight@endeavor.org.

PHOTO ON RIGHT: WAYNE MILLER OF MAGNUM PHOTOS FOR FAIRCHILD SEMICONDUCTOR

THE EIGHT CO-FOUNDERS OF FAIRCHILD SEMICONDUCTOR
From left to right: Gordon Moore, Sheldon Roberts, Eugene Kleiner, Robert Noyce, Victor Grinich, Julius Blank, Jean Hoerni, and Jay Last.

"That's part of the legacy of Fairchild that maybe doesn't get the attention it should... Every time we came up with a new idea, we spawned two or three companies trying to exploit it."

–Gordon Moore

FREQUENTLY ASKED QUESTIONS

We have presented the results of this report to a number of audiences over the last few months. Several questions have come up repeatedly during these discussions. We have collected these questions along with brief answers on the next two pages for those readers who might be interested.

1 Why did Endeavor Insight choose to analyze the history of Silicon Valley? How does this relate to the work Endeavor does supporting entrepreneurs?

Our team at Endeavor Insight has conducted research on successful entrepreneurship communities in cities across the Americas, Europe, the Middle East, Africa, and Asia. We have observed a pattern in these cities, in which successful entrepreneurs commit to reinvesting their resources into new generations of growing companies. We were curious to see if this pattern also existed in the world's most well-known entrepreneurship community, so we began studying Silicon Valley.

This research is closely related to Endeavor's work to support fast-growing entrepreneurs in more than 20 countries. Endeavor identifies high-potential entrepreneurs and connects them to resources that help them access talent, investors, and new markets. As the entrepreneurs we support become successful, we work to empower them to become role models, mentors, and investors in their local communities.

For more information on Endeavor's support programs for entrepreneurs, please visit www.endeavor.org/model/ourmodel.

2 Don't all tech companies naturally multiply and create spinoffs like Fairchild Semiconductor did?

Unfortunately, companies like Fairchild are quite rare, even in the technology sector. It is useful to compare the history of Fairchild with that of its biggest rival in the 1960s: Texas Instruments. Texas Instruments was incredibly innovative. The Dallas-based company actually developed integrated circuits before Fairchild did. It also achieved even greater financial success. When Fairchild was the number two company in the chip market, Texas Instruments was number one.

Despite Texas Instruments' achievements, the Dallas area did not develop a community of successful computer chip entrepreneurs during the time that Silicon Valley was growing in California. John Tilton's authoritative book on the development of the computer chip industry tracks the creation and growth of the sector across the U.S. up to 1971. His work does not cite any Dallas-based companies producing semiconductor devices in its lists of businesses working in the sector, except Texas Instruments.

3 If it is rare to see entrepreneurs reinvesting in others, can we find other examples of the Entrepreneurship Acceleration Cycle in addition to the ones covered in this report?

During the writing and editing process, we had to trim out many other stories of successful entrepreneurs in the Valley who became important mentors, role models, and investors. The co-founders of Sun Microsystems, for example, have started multiple investment firms and support a host of successful spinoff firms that emerged from their original company. If we look to cities outside of California, we can also see similar patterns that supported the development of successful industries, including the high-end restaurant sector in Lima, for-profit healthcare companies in Nashville, and the offshore services industry of Bangalore.

4 What would have happened if Arthur Rock and Sherman Fairchild had not helped to support the eight co-founders of Fairchild Semiconductor?

Without support from Rock and Fairchild, it is unlikely that the co-founders would have started their company. Without Fairchild Semiconductor,

it is difficult and perhaps impossible to see how spin-off companies like Intel, AMD, and Applied Materials would have developed in the Bay Area. After all, according to the article that created the "Silicon Valley" name, every local computer chip firm except two could be traced back to the eight co-founders.

5 Why did William Shockley choose to start his company in Mountain View?

As far as we can tell, William Shockley never publicly explained why he chose to locate his company in the Bay Area. However, it is obvious that this location was far from his first choice. He had worked to set up his firm in Boston and then in Southern California before finally settling in Mountain View.

Many of the people who knew Shockley at the time he was setting up his company have also emphasized the role that his personal connections to the region played in his decision. The inventor had recently divorced and left the company where he had worked for most of his career. The familiarity of his hometown and the fact that his mother's health was declining certainly influenced his choice.

6 What sort of role did Stanford play in the creation of the computer chip industry that became Silicon Valley?

There are three ways that Stanford could have helped to create the local semiconductor sector: by producing its founders, creating key research for the sector, or supporting the launch and growth of computer chip companies in the Tech Park it established in 1951. Our team investigated each of these potential links during the course of our analysis.

We can find relatively few examples of Stanford graduates among the founders of the early computer chip firms. Only one of the eight Fairchild founders came out of Stanford. (By comparison, three came from MIT and two came out of Cal Tech.) As far as we can tell, none of the founders of influential companies like Amelco, Applied Materials, and Intel were alumni of the school. According to historians' analysis of the major research breakthroughs that supported the growth of the computer chip industry in the 1940s through the 1960s, none of these key discoveries came out of Stanford. Many people also mistakenly believe that the first semiconductor companies started out in Stanford's Tech Park. This is not the case. In fact, a map in Hoefler's "Silicon Valley" article clearly shows that the early computer chip firms were all clustered together several miles away from the university.

While Stanford is not linked closely to the creation of the industry, it did a great deal to accelerate its growth. Stanford's dean of engineering, Fred Terman, sent one of his professors to work alongside Shockley and the eight co-founders of Fairchild to learn how they were producing semiconductor devices. This professor eventually returned to Stanford and created the university's first semiconductor laboratory. While this lab did not produce any of the early advances in the field, it did provide training to local engineering students, which greatly improved the supply of talent in the area as the industry was growing in the 1960s.

7 What role did other companies in the San Francisco area play in the creation of the computer chip industry?

There was a small technology sector in the Bay Area during the 1950s. It was made up of Hewlett-Packard, which was primarily an instrument manufacturer, and a number of firms working in the microwave industry. The technologies used by these companies were very different than those in the transistor and other early computer chips. Perhaps because of this, we can find very few examples of connections between these companies and the early computer chip firms that made up Silicon Valley. Historians have identified more than 30 computer chip companies that existed in the Bay Area when the "Silicon Valley" name was coined by Hoefler. Their records show that only one of these early computer chip companies included a co-founder from Hewlett-Packard or the local microwave firms.

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ENDEAVOR is leading the global high-impact entrepreneurship movement to catalyze long-term economic growth. Over the past fifteen years, Endeavor has selected, mentored, and accelerated the best high-impact entrepreneurs around the world. To date, Endeavor has screened more than 30,000 entrepreneurs and selected 800+ individuals leading 500+ high-impact companies. These entrepreneurs represent over 225,000 jobs and over $6 billion in revenues in 2012 and inspired future generations to innovate and become entrepreneurs too.

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ENDEAVOR INSIGHT, Endeavor's research arm, studies high-impact entrepreneurs and their contribution to job creation and economic growth. Its research educates policy makers and practitioners on how to accelerate entrepreneurs' success and support the development of strong entrepreneurship ecosystems. In 2013, Endeavor Insight joined with the Kauffman Foundation and the World Bank to co-found the Global Entrepreneurship Research Network.

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