

6.0 CASE STUDY: SILICON VALLEY

6.1 Background

How did an area known as the Valley of Hearts Delight at the turn of the century dominated by fruit orchards transform itself into the leading modern technological region in the world?

Professor Fred Terman of Stanford University's Department of Electrical Engineering is commonly attributed with the title Father of Silicon Valley. In the 1930s, there were very little opportunities for a career in engineering in the region surrounding Stanford University with the best graduates having to go to the East Coast to find career opportunities. Terman encouraged his students, William Hewlett and David Packard to set up their own company and commercialise the audio oscillator, which resulted in the birth of Hewlett Packard which, was incorporated in 1939. Hewlett Packard is today one of the worlds largest producers of computers and test and measurement devices employing more than 80,000 people worldwide.

During World War 2, Terman was asked to head a big defence project at Harvard University, which put him in the mainstream of government electronic research. Returning to Stanford in 1946 as dean of engineering, his government contacts helped him attract federal funding.

In 1950s the thought of building an industrial park on land belonging to Stanford University which had been bequeathed by Leland Stanford arose. The original bequest prevented its sale but nothing prevented it from being leased and long-term leases were just as attractive to businesses as outright ownership. The Stanford Industrial Park was formed with the goal of creating a high technology centre close to a co-operative university. Beginning 1953, Varian Associates, Eastman Kodak,

General Electric, Preformed Line Products, Admiral Corporation, Shockley Transistor Laboratory, Lockheed, Hewlett Packard and others moved in.

Terman was instrumental in encouraging William Shockley the inventor of the transistor to return to his hometown Palo Alto. Shockley returned forming Shockley Transistor Laboratory in 1956 saying that his decision was made primarily due to the regions pleasant climate. In 1957, eight of Shockley's bright electronics specialist known as the rebellious eight left to form Fairchild Semiconductor in Palo Alto. Fairchild in turn became the birthplace of no less than 38 new companies started by former employees with Intel being the most famous. The rest is history.

The term Silicon Valley first came about in an article entitled "Silicon Valley USA" by Don Hoefler for Electronic News in 1971. Silicon Valley is an area located on the San Francisco, California peninsula, radiates outward from Stanford University. It is contained by San Francisco Bay on the east, the Santa Cruz Mountains on the west, and the Coast Range to the southeast. The area contains more than 2000 IT companies along with their associated support firms making it the densest concentration of creative industry in the world boasting such home grown household names such as Apple, Sun, Oracle, Cisco, 3Com and Advanced Micro Devices (AMD).

6.2 Success Factors

Major Higher Education and Research Institutions

In order to have a successful technological region, universities are required to produce the technically skilled manpower required for the vitality of those industries. Silicon Valleys success is to a great extent attributed to the presence of Stanford University and to a lesser extent the University of California Berkeley both world class institutions of higher learning with strong research traditions. Strong research institutions also help create a culture which values innovation.

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Another distinct feature of Silicon Valley is the extent to which universities and industry collaborate with one another. The setting up of Stanford Industrial Park was said to have encouraged close collaboration between the university and industry with staff doing research / consultancy for industry or setting up their own start-up companies.

Infrastructure

Being in the developed world, the region has world class communication, transportation and educational systems although the quality of life is said to be declining primarily due to the skyrocketing of home prices and increases of traffic jams in the valley.

Venture Capital

Venture capitalist fund companies, which are entrepreneurial and innovative with very high growth rate potentials over a 5 to 10 year period. The presence of venture capital ensures technology start-ups are able to obtain the necessary capital in order to launch out their ideas. Although venture capital investment has dropped due to the short-term bubble, which burst in 2000, Silicon Valley continued to attract USD6.24 Billion in 2001 which is just above the levels attracted in 1998. Joint Ventures Comparative Analysis Study (1997) comparing Silicon Valley with 11 other technology regions in the United States showed Silicon Valley attracting 46% of all venture capital invested making it the leader in the world in terms of venture capital attraction. Chart 3 shows venture capital financing in Silicon Valley.

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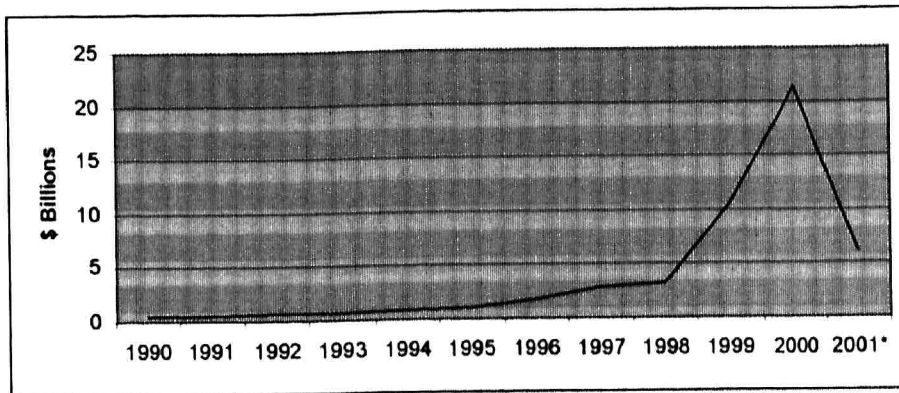


Chart 3: Venture Capital Financing in Silicon Valley
(Source: PricewaterhouseCoopers MoneyTree Survey in Partnership with VentureOne; Collaborative Economics)

Local Anchor Megasuccessful Companies

The presence of local anchor megasuccessful companies helps inspire others to emulate in their footsteps in creating entrepreneurial start-ups. The genesis story of Dave Packard and Bill Hewlett founding Hewlett Packard in a garage in Addison Avenue would have inspired generations of engineer-entrepreneurs from Apple to Yahoo. Today Silicon Valley is home to a very large number of successful anchor companies. These anchor companies are spearheads of innovation as they are either leaders or among the leaders of their respective specialised fields requiring them to invest heavily in R&D. They also help spawn a support services industry by subcontracting various jobs out.

Weather

The pleasant weather surrounding San Francisco Bay area encourages talented people with technical skills who may have first thought of coming to Silicon Valley for a short stint of time for career purposes to extend their stays making it permanent.

Culture

Culture is the intangible factor attributed to Silicon Valley's success. The general attitude taken is that hard work and intelligence are rewarded with success. The atmosphere in the Valley is one of hyper competitiveness and seven-day workweeks are common. Some companies are also said to be turning into 24-hour planned communities with various facilities made available at their premises due to the amount of time employees spend in their offices. At networking company 3Com, film can be developed at the company store or cars washed in the parking lot. The down side of this is that it leaves little time for family or relationships. According to Steve Jobs, co-founder of Apple Computer "Silicon Valley is a meritocracy. It doesn't matter how old you are. What matters is how smart you are." Joint Ventures Comparative Analysis Study (1997) showed that Silicon Valley is the most productive region in the United States as measured by value added per hour – 37% higher than the next closest region. Silicon Valley's value added per employee as a measure of productivity increased 4.6% in 2001 to USD170,000 in contrast with the national average of USD56,000.

Entrepreneurship is celebrated in the valley with risk taking being part of the culture and failure seen as a badge of merit. Fred Terman of Stanford University set the entrepreneurship ball rolling beginning in the 30s when he encouraged staff and students to not only do cutting edge research but to commercialise research into applications demanded by the markets. The amount of risk in attempting to form a start-up in Silicon Valley is also mitigated by the presence of a critical mass of technology companies which would make it easier for the entrepreneur to find a job should his venture fail.

Networks

A high degree of informal networking occurs in Silicon Valley making it easy for ideas or information to flow as well as deal making to occur.

People make connections in diverse ways from chance meetings at a café to attending parent-teacher nights. Former Intel CEO Andrew Grove says: "Proximity helps. People have worked with each other, competed against one another. We have a rich ecosystem." Frank Levinson of Finisar gives an example of how a chance meeting with Bob Metcalfe who co-invented the Ethernet developed into a friendship which latter resulted in Finisar changing direction due to counsel given by Bob Metcalfe and growing in the second half of the 90s.

This informal network along with geography also contributes to job mobility, which in turn results in cross-pollination of ideas. In the 1980s the average turnover rate for small to midsize firms was 35% and average job tenure was 2 years. The high concentration of technology based firms made it easy for people to change jobs without changing other aspects of their lives.

Specialised Support Services

Silicon Valley boasts various specialised professional and technical support services, which make it easy for start-ups to be formed. Specialised professional support services would include among others services by tech savvy lawyers and human resource outsourcing firms. These tech savvy lawyers would be able to come up with stock option plans and prospectuses very quickly as well as understand patent and intellectual property laws. The human resource outsourcing firms would be able to put together a payroll processing system with worker compensation insurance and customised benefit plans within a very short period of time. Steve Jobs of Apple says "there are a lot of people in Silicon Valley who can put companies together for you in an afternoon." Specialised technical support services such as specialised equipment or toolmakers are also available in Silicon Valley.