

# Is it possible to replicate Silicon Valley in Japan?

Tetsuo Mizunuma  
(Japan, age 34)

(full text)

## 1. Introduction

As world economies struggle with systemic challenges and adapt to difficult changes, Japan has proven to be no exception. Two critical issues confront Japan's mid-term and long-term prosperity. First from the outside, the march of globalization continues. The business world continues to expand operations globally, and cross-border activities blur geographic economic borders. And while emerging economies such as BRICS<sup>1</sup> continue to gain influence, Japan's presence has seen decline. And then from the inside, Japan's aging society is leading to a population decline of unprecedented speed. The resulting demographic shift will pose a fearsome challenge for Japan. The latest government forecast predicts that by 2060, almost 40% of Japan's citizens will be over 65 years old, and the island nation's population will have shrunk from 128 to just 86 million, a decrease of more than 32%<sup>2</sup>.

Unfortunately, Japan's future requires more than just hope—rather, it is a challenge that requires immediate action. More innovation, high value-added products and services, and market competitiveness will be needed in order for Japan to maintain economic growth and high standards of living. This is especially the case in the medical services, nursing care and health care sectors.

Regarding the source of innovation, history shows that at least in Japan, fundamental changes are needed. At the end of World War II, most groundbreaking innovations were developed by industrial laboratories within large corporations. By the 1990s, however, the prevalence of universities and startup companies increased, supplying new technology, out-of-the-box ideas, and risk-takers to bring those ideas to market. As evidenced by the successful partnership of Stanford University and Silicon Valley, this new innovation model has tremendous impact and unlimited potential. A success story of particular note is Facebook, which started its service in September 2006, and by August 2013 reached a market capitalization of ¥100 billion. In 7 years Facebook rocketed up in size, and quite surprisingly, in its ascent Facebook surpassed every single Japanese corporation except for Toyota Motor Company<sup>3</sup>. The 21<sup>st</sup> century innovation model, called the “Silicon Valley” or “SV” model in this essay, enables dynamic and game-changing innovation, and brings about cutting-edge technology and new ideas into market faster. The dynamic, idea-incubating environment that characterizes Silicon Valley is a social infrastructure, which if executed properly has great potential for society and for Japan.

Japan understood the importance of this new innovation model, and since the late 1990s, government, industry and academic sectors have together attempted innovation reforms, but surprisingly have achieved little

---

<sup>1</sup> BRICS stands for Brazil, Russia, India, China and South Africa, which are emerging economies with high economic potentials, and key players in each region.

<sup>2</sup> March 2013, National institute of population and social security research released “Population Projections for Japan” ([http://www.ipss.go.jp/site-ad/index\\_english/esuikai/gh2401e.asp](http://www.ipss.go.jp/site-ad/index_english/esuikai/gh2401e.asp))

<sup>3</sup> On August 26<sup>th</sup> 2013, Facebook (NASDAQ: FB) marked its closing price at \$41.34 and its market capital was over \$100 billion or approximately ¥9.8 trillion. On the same day, Toyota Motor Cooperation (TSE: 7203)'s market capitalization, the largest in Japan, marked approximately ¥20 trillion, and Mitsubishi UFJ financial group (TSE: 8306), 2<sup>nd</sup> largest, marked approximately ¥8 trillion.

success. Their failure was blamed on a lack of consensus in Japan, that there was no clear understanding of what challenges its society and economy faced, or how to best solve those challenges. Many probably thought that Japan would be able to overcome whatever challenges there were, without any change or even any effort. Evidently the opposite is true. In the past two decades, Japan's average economic growth was a mere 0.9%, while government debt grew to ¥750 trillion (approximately \$9.5 trillion) or 224% of its GDP<sup>4</sup>. Furthermore, every year more than 1.6 million citizens joined the ranks of retirees, receiving pensions and other social benefits. Therefore, it is crucial for all Japanese citizens to take on their country's challenges as their own, and to contribute to society with their talents. Through social responsibility, Japan will be able to overcome the challenges facing its society and economy, and return to being a country admired by the world.

## 2. The Silicon Valley Model

### (1) The "Holy Land" of entrepreneurs

Starting with the Industrial Revolution in the 19<sup>th</sup> century, innovation was led by individual inventors<sup>5</sup>. Inventors patented their inventions, and corporations obtained licenses and manufactured and sold products in large scale. As economies developed, corporations grew in size, established their own laboratories and research centers, and in so doing the point of innovation effectively moved to the corporation. From the 1920s through the 1970s, industrial laboratories enjoyed their glory days, and conducted state-of-the-art research, from which some achievements won Nobel Prizes<sup>6</sup>. Some well-known cases include: nylon invented at DuPont, the transistor invented at AT&T's Bell Labs and the prototype of the modern personal computer in Xerox's PARC. On the other hand, universities in their long history often shied away from innovation development, with some exceptions such as chemistry. In Europe and the US, there was a clear distinction between science and engineering, with virtually no communication channel between the two. In contrast, the fact that many revolutionary technologies were developed in Silicon Valley has attracted attention to the knowledge, technological, and human potential that exists in universities.

A suburb of San Francisco, CA, an area of just 15 hundred square miles, is called the "Holy Land of Entrepreneurs", and is the closest place in the world to the future. In this place, a lot of startup companies are established<sup>7</sup>, and their ideas are tested in the market. Globally-grown corporations with revolutionary technology, such as Hewlett-Packard, Apple, Intel, Cisco Systems, Sun Microsystems, Oracle, Yahoo, eBay, were established there, and within this decade, Google, Facebook, Twitter and Ustream were incubated. Technologies created in Silicon Valley change our lifestyle, values, politics, and economies, and the world closely watches for its new developments.

"Silicon Valley" first appeared in 1971<sup>8</sup>, but its history started in 1891 when Stanford University opened. At that time, East Coast cities such as Boston and New York dominated the US economy. The West Coast on the other hand was a yet undeveloped area with no major industries, no large financial institutions, but had a frontier

---

<sup>4</sup> Ministry of Finance's website ([http://www.mof.go.jp/tax\\_policy/summary/condition/index.htm](http://www.mof.go.jp/tax_policy/summary/condition/index.htm))

<sup>5</sup> Famous examples are Edmund Cartwright, George Stephenson, Thomas Edison, and Graham Bell.

<sup>6</sup> 13 researchers at Bell, 5 at IBM, and 2 at GE won the Nobel prizes. From Japanese corporations, 1 researcher at Shimadzu in 2002 received.

<sup>7</sup> According to "Silicon Valley 2012" (<http://www.jointventure.org/images/stories/pdf/2012index.pdf>), averagely 47 companies open business, and 35 closed every day.

<sup>8</sup> Journalist Don Hoefler posted articles "Silicon Valley in the USA" to the industrial magazine "Electric News" in 1971.

spirit and a healthy sense of rivalry with the East Coast. In 1925, Frederic Terman became a professor in Stanford's engineering department, and initiated several new developments. He scouted scholars from other universities to elevate its graduate-level courses to the top<sup>9</sup>, built facilities for industry-university cooperation like Stanford Research Institute and Stanford Industrial Park, started a master's program for working engineers, and encouraged graduates to start their own companies. Terman played a very important role in creating the basis for today's Silicon Valley. The unique culture of industry-university cooperation and entrepreneurship was nurtured and grew for over half a century, and was endorsed by many of its successful cases. Some say that as Egypt was the gift of the Nile, Silicon Valley was the gift of Stanford.

## (2) Primary characteristics of SV model

Silicon Valley is a unique and special place, even within the US. It is a place that attracts technologies, ideas, researchers, and entrepreneurs from all over the world. The SV model has several characteristics<sup>10</sup>: 1) The university is greatly involved, and provides technologies, ideas, and human resources; 2) New technologies and ideas are tested in the market, in most cases by startups established near the university; 3) Employees enjoy a high degree of freedom to move between firms, so new technologies and ideas quickly spread and are shared in the university's neighborhood; 4) Startups are funded by direct financing such as venture capital or funding "angels", and these funding agents work closely with startups; 5) Professionals like engineers, researchers, lawyers, and accountants are available in the area. As a rule, the university, startup companies, financial institutions and other professionals and services are openly connected in one network, with the central focus on the university as the innovation generator. Around this nucleus, people, information, and technologies dynamically move and react.

On the question of why the SV model achieves successful outcomes, several hypotheses are presented: 1) The "Linear" model, where research, development, production and sales are carried out in sequence, does not work anymore. Firms have found that understanding the customer's needs gives valuable direction to future technology development; 2) Technological development, and the competitive environment, have both picked up speed. Flexibility becomes key: in organizational structure, in access to technologies and in talent acquisition; 3) Products are becoming more and more complex, and one company can no longer develop a successful product working by itself. Cooperation with outside partners becomes much more important, especially in the case when a new industry standard or protocol is being developed. In short, the SV model is the most successful innovation model in this modern market, where complex technologies must be developed in a short span of time<sup>11</sup>.

## 3. Japan's efforts to replicate Silicon Valley

In post-war Japan, most innovations were created within large corporations. As Japan's economic recovery proceeded in the 1960s, large corporations established their own industrial laboratories, conducting original research while attempting to pick up overseas technologies. As in Europe and the US, there was a distance

<sup>9</sup> Prof. Terman invited William Shockley, one of the inventors of the transistor and the Nobel winner, to Silicon Valley to establish Shockley Semiconductor Laboratory, which results in long-standing positive effect for the industry in Silicon Valley.

<sup>10</sup> Prof. James Gibbons at Stanford University described Silicon Valley's social infrastructure in a simple way "it's OK to fail, it's OK to talk, it's OK to change" (<http://news.stanford.edu/pr/95/950321Arc5308.html>)

<sup>11</sup> The usefulness of SV model depends on the characteristics of industry or products. For example, materials and basic components industry, where pace in technological development is relatively slow and one corporation is able to manufacture whole products

between industry and universities in Japan as well. As most Japanese corporations had their eyes fixed on overseas technologies, and had their own laboratories with abundant funding, they relied little on university research. In addition, student protests and a university-based anti-war campaign created social tension and further deterred a close relationship between industry and universities.

The turning point came in the 1990s. With the bursting of Japan's asset bubble, the economy slowed. As the US enjoyed high economic growth led by new industries such as information technology and biotechnology, Japan decided to follow the US' lead. Japan quickly implemented industry-university cooperation policies to try to replicate a Silicon Valley in its own territory. The Japanese government implemented the Technology Licensing Organization Act of 1998 and a Japanese version of the Bayh-Dole Act of 1999, and the door to allow the transfer of government-funded research to private entities had opened. The government followed up in 2002, rolling out "project for 1000 university-launched venture companies"<sup>12</sup>, and offered direct support for these ventures. In 2004, 87 national universities re-formed into an independent administrative agency, giving each university a distinct legal entity and broader discretions. In addition, the government helped ease the plight of entrepreneurs in Japan. It enacted an entrepreneur support tax incentive scheme in 1997, the Japanese version of the limited partnership in 1998, and the Japanese version of the Small Business Innovation Research Program in 1999. These new policies, carried out with unprecedented speed, brought industry and academia closer, and improved the business environment for entrepreneurs. However, while the Japanese government showed much fervor in its attempt to legislate innovation, the results so far have not been as inspiring. A couple of small successes have come out<sup>13</sup>, but the 21<sup>st</sup> century Japanese "from startup to huge multinational-corporation" story has yet to be told.

#### 4. Proposals

##### Proposal 1. Sharing social responsibility

As Silicon Valley's reputation for innovation rose to the world stage, many countries including Japan have attempted to replicate its success. While some have gotten close<sup>14</sup>, none have been able to match the original, perhaps due to its unique history. When Stanford University was founded, the West Coast was largely undeveloped. The university's founder wished to establish an excellent education institution for the area and to enlighten its people.<sup>15</sup> As the University community grew and graduates found it hard to find enough job openings, Prof. Terman had an idea to develop a stronger, positive relationship between the University and local industry. This idea crystalized into the Valley we know today. At the core of this social network is the commitment by stakeholders and local professionals to contribute to their local community and to broader

---

<sup>12</sup> According to Ministry of Economy, Trade and industry, 1809 companies are operating as of March 2010. ([http://www.meti.go.jp/policy/innovation\\_corp/fy23vn.pdf](http://www.meti.go.jp/policy/innovation_corp/fy23vn.pdf)). Out of them, 15 companies became public.

<sup>13</sup> Example are as follows; 1) In October 2008, Evcc (private) Evcc signed the contract with Germany's Boehringer Ingelheim GmbH over exclusive licensing antibody for commercial development with € 5.5 million, and in September 2011 signed the contract with Japan's Astellas Pharma with up to ¥13 billion. 2) in 2013 Spiber (private) announced its successful mass-production of synthetic spider silk, which is the first case in the world. 3) In August 2009, SI drive was incorporated, and planned to roll out the electric cars based on successful prototype Eliica.

<sup>14</sup> The closest case is Austin in Texas. New York city, Boston, Kenbridge in UK, Munich in Germany, Tel Aviv in Israel, Bangalore in India, Zhongguancun in China, Hsinchu in Taiwan follows.

<sup>15</sup> There was no high education institution for 2 centuries in the West Coast since Ivy League universities established in the East Coast. Stanford University opened in 1891, University of California at Berkley in 1868, and California technology of institute in 1891.

society. While each contributor may have strong individualism and self-interest, they are brought together by the goal of making the world a better place.

A couple of examples are as follows. In the late 1970s, many startups ventured into the just-emerging personal computer market with competing ideas and business models. However, one common belief was widely-shared that the computer, like the wisdom of mankind, should be made available to as many people as possible, and that the freedom of ideas was a positive contribution to society<sup>16</sup>. Online market services, emerging in late 1990s, created an environment where individuals and small business were suddenly able to compete with large corporations. These new markets greatly contributed to the reduction in poverty and the revitalization of local economies. Google, the #1 search engine service in the world, upholds a mission to “organize the world's information and make it universally accessible and useful<sup>17</sup>”. Free and equal access to information and knowledge has unlimited potential to change society. It can enhance the freedom of expression, democracy, equal opportunity to receive education, reduction of poverty, empowerment to individuals, and so on. Ustream, the video-sharing and broadcasting service, was developed to enable US army soldiers deployed overseas to communicate with their friends and family. It is said that an entrepreneurship culture is deeply entrenched in Silicon Valley. Rather, it should be properly termed as “a culture of contribution to society with a strong belief in new technology”. In short, people and companies in Silicon Valley share the strong belief that new technology and innovation can overcome social challenges.

Turning to Japan, many still believe that their contribution to society is to play one's own specific role with dedication. For example, the researcher should only write his or her thesis, the corporation should only pursue its stockholder profit, and government should only dutifully enforce its laws. Such a narrow attitude is not enough to solve greater social challenges. Japanese citizens need to step out of their self-confined spheres, and work together for society. When universities discover new technologies, who will commercialize them? Due to a phenomenon called “the innovator's dilemma<sup>18</sup>”, industry is often inhibited from embracing new ideas. Government collects tax and distributes services, but is not able to devise new services. It is crucial that all stakeholders pay attention to current social challenges, and support each other formally and informally as stewards of society. In the SV model, universities, engineers, entrepreneurs, funding providers, local communities, and government are openly connected under a single objective. With regard to effectively replicating a Silicon Valley in Japan, it is proposed that people in Japan regard their country's social challenges as their own challenges, to find what they can do to contribute to society, and to take action. One should not feel that innovation is only possible for engineers. Even without special training, one can express hidden needs as a consumer, can buy stock as an individual investor, or at least show moral support for entrepreneurs. Most in Japan lack the above-mentioned attitude for initiative, and entrepreneur “fads” in Japan have always ended in a bust.<sup>19</sup> People are very conscious about how a future tax increase may affect their pocket books; rather, they should be thinking about the challenges their aging society faces, and the names of companies and people who are actually taking action.

---

<sup>16</sup> “Computer Lib” (Ted Nelson, 1974) was widely read among computer engineers and entrepreneurs.

<sup>17</sup> Google's website (<http://www.google.com/about/company/>)

<sup>18</sup> See “The Innovator's Dilemma” (Clayton Christensen, 1999)

<sup>19</sup> Japan has experienced entrepreneur fads 3 times: 1<sup>st</sup> boom was from late 1960s to 1973, 2<sup>nd</sup> was late 1980s, and the last was late 1990s to 2007.

## Proposal 2. Shaping a more responsible, more innovative society

### (1)The role of government

The most important role for government is to arrange regulation, so that new products and services can be developed and sold without undue bureaucracy. As current regulations are aligned to existing technologies, change may be needed. For example, on-line services such as search engines, video-sharing sites, and peer-to-peer communications portals are often in conflict with copyright laws. Another example is the blurred line between medical and nursing care, which is resulting in inefficient regulation. Government should take steps to avoid the situations where regulation stifles motivation and incentive of entrepreneurs.

Secondly, Japan must review the institution of lifelong employment.<sup>20</sup> While a fundamental part of traditional post-war Japan, lifelong employment tends to concentrate human brainpower within a single company and “hold” it inside. This makes it difficult for startups to find a footing to attract the best and brightest. Inflexibility in movement of people and ideas leads to inflexibility in the economy.

Lastly, to promote entrepreneurship, more support should be given to small and mid-sized businesses that focus on high-tech research and development. And it is necessary to further review and reform the various tax relief schemes<sup>21</sup>, Japan’s version of the SBIR<sup>22</sup>, personal credit surety bonds practices and the bankruptcy exemption limitation.

### (2)The role of corporations

While conflict between disruptive technology startups and large corporations will inevitably occur, corporations should not unfairly impede the startups’ businesses. The two are not necessarily opponents—each has its own role and place. Startups should expect to take the role of researching and developing new products and services, which is accompanied high risk and uncertainty. Large corporations, respectively, should take the role of implementing such products and services. Corporations should go even further and cooperate with startups directly. This symbiotic relationship may provide a solution for the innovator’s dilemma.

Additionally, corporations must treat researchers and engineers favorably. While anyone can innovate, the engineer’s individual creativity is a core source of innovation for new technology. In Silicon Valley, engineers are often motivated using stock option incentive schemes. Japanese corporation on the other hand usually downplay this practice<sup>23</sup>.

### (3) The role of individuals

As economies interconnect globally, individuals must be prepared for a harsh, competitive market. Although

---

<sup>20</sup> Possible agendas are 1) introduction of rules on monetary compensation in disemployment, 2) repeal on preferential tax treatment on retirement compensation, 3) improvement of portability on corporate pension.

<sup>21</sup> Possible agendas are 1) enlarge the applicable term of loss carry forward, 2) incorporation of pass-through taxation in Japanese version of Limited Partnership, 3) improvement on tax relief on individual investors on startups, 4) incorporation on tax relief on Technology Transfer Organization.

<sup>22</sup> Japanese version SBIR differs from US’s SBIR in a couple of aspects: Japanese version doesn’t have inter-ministry uniform program, neither phase selection, neither benefit in government procurement.

<sup>23</sup> In the dispute between employer and employee engineers, the court in Japan judged to compensate sizable rewards for employee in several cases, such blue light-emitting diode case, flash memory case, nitride semiconductor crystal film case, and artificial sweetener case.

Japanese youngsters often tend towards introversion and narrow-mindedness, many successfully make their marks on the world stage in the fields of sports and the arts. Sports and the arts are seamlessly connected to the global stage, and athletes and artists are naturally aware of the need to aim toward their potential. This idea can also be applied to the business world. If young adults in Japan were to just realize that a global stage is waiting for them, many will utilize their abilities, and find their calling in the world.

Secondly, while at Japanese universities there is a high wall separating the liberal arts and the sciences, students need to be interested in both areas of study. In reality, both sides of the brain are important for success in the world. Bankers need some degree of science knowledge for their clients; engineers should understand regulations and social trends.

##### 5. “Change yourself, Change society”

Silicon Valley entices many people. Entrepreneurs and researchers hold untapped creative ideas that are waiting to be realized. One could say that its contributors have a common “ideology”, to “change oneself, change society, and change the world”, expressed as a combination of a challenging spirit, a public mind and steadfast determination.

Japan as a whole cannot become, nor should it behave like Silicon Valley. Large corporations will continue to innovate, and play an important role in developing new products and services. However, Japan needs to have at least one place like Silicon Valley, where an individual can perform to his or her own ability and contribute directly to society. Creating such a place not only provides an alternative to working in the corporate world; it also has the power to change peoples’ careers and values, and can be a positive force for society and hope for all. In our relatively affluent society, people when enlightened will pursue ideas, and demand more opportunity and a better tomorrow.

While Japan will be the first to face an aging society, this is not Japan’s challenge alone. Other Asian countries including Korea, Singapore and China, and European countries including Italy, Spain and Germany will all face the same challenge soon. An aging society causes challenges, such as a ballooning demand for medical and nursing care, but also social transformation due to demographic change, which could endanger political stability. When Japan overcomes this challenge with innovation, its experience will set very positive precedent for the world. Japan’s success will send a strong message to others, and contribute to the political stability and economic development of the world.

##### 6. Conclusion

It is said that Japan is filled with a sense of stagnation. There is a clear reason behind these words. Japan faces serious challenges, such as globalization and an aging society, and solutions are still being sought. Challenges are broad in range: the surging demand in social benefits, the need to redesign cities and public transportation for senior citizens, the increasing burden on the working generation, and the decreasing workforce. Creating more innovation is the only way to overcome these tough challenges and support economic growth.

Innovation models have evolved throughout history, and in the 21<sup>st</sup> century, the “Silicon Valley” model has been proven the model of choice. If Japan desires to overcome its challenges, it must effectively replicate this model within its borders. Japan has many advantages: it has world-class universities and research centers, a rich

accumulation of technology, corporate capital and experience, diligent workers, and a stable and equal society. Most emerging countries do not have any of these resources. To effectively replicate the Silicon Valley model, all of the stakeholders involved—government, universities, entrepreneurs, and corporations—need to come positively and responsibly to the table, and connect openly with the shared goal of making the world a better place. As the first step, all should pay more attention to the challenges of society where they live, find how they can contribute, and take action. And, with the “Silicon Valley” model as a guide, government, corporations and individuals should work together to nurture a more responsible, innovative society. In doing so, perhaps step by step, Japan will certainly be able to overcome its challenges, regain its confidence and receive admiration from the world.