Developing Future Innovation Hubs Through The Case Study of Silicon Valley

by

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ABSTRACT

In today’s innovation economy, the development of innovation hubs is viewed as a strategic undertaking to nourish the entrepreneurial ecosystem and to enhance economic vitality. The study uses Silicon Valley, one of the most successful innovation hubs in modern history, as a case example to find the factors that have contributed to its success, and how these factors will evolve over time. Using existing literature and in-depth interviews, the study produces a framework of key factors that will influence the development of such hubs in the future.

Silicon Valley case shows that the foundation element of a successful innovation hub is people – the human capital. Adding to this element, five hardware ingredients – Universities & R&D Centers, Venture Capital, Major Corporations, Service Providers, and Government – have an irreplaceable role in sustaining the vitality of such hubs. The intangible software, culture with its four dimensions – entrepreneurial mentality, mobility of resources, global perspective and shared vision, acts as a catalyst that brings the foundation element and hardware ingredients together, allowing them to interact and cooperate. Ultimately, an effective entrepreneurial ecosystem is formed from the combination of all these factors.

The findings from in-depth interviews suggest that the original culture of Silicon Valley will continue to play a key role in future innovation hubs. This entrepreneurial mentality, especially in terms of openness, supportiveness, forgiveness and risk-taking attitude, remains highly desired by today’s entrepreneurs.

Simultaneously, recent shifts in the demographic landscape have changed the nature of the foundation element – people. Millennials and the Creative Class have become a dominant pool of talented workforce, and they possess different values and preferences compared to other generations. Together with urbanization, this creative workforce shows high appreciation towards the role of place and urban lifestyle. Thus, in order to successfully attract and retain such talents, urban location will play an increasingly important role in future innovation hubs. It is estimated that the “place element” will become a new addition the innovation hub hardware system, supporting the overall development of entrepreneurial climate.

Thesis Supervisor: John F Kennedy

Title: Lecture, Center for Real Estate
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Introduction

The rapid growth of the innovation economy has significantly influenced the landscape of the 21st century. Today, the economy is not only driven by traditional forces, but by the ability of nations to innovate technologically and organizationally. Around the world, policy makers are seeking ways to foster innovation and entrepreneurship development in order to revive economics and enhance prosperity. Especially following the success of innovation hubs such as Silicon Valley, it has become clear that such types of innovation clustering have potential to drive value creation at great scale, and establish influential companies and products internationally. (Engle, 2014)

It is expected that innovation hubs will play an increasingly important role in a nation’s economic vitality, and establishing a nourishing environment for startups is seen to be a strategic act to gain competitive advantage. Increasingly, regions are trying to develop their own innovation clusters with a goal to mirror the success created by the original Silicon Valley, and there are abundant studies available to guide policy makers, developers and investors in creating such hubs. However, it is important to note that one of the fundamental elements that has contributed the success of Silicon Valley is its people, the entrepreneurial and talented human capital. With distinctive shifts in demographics, a new generation, Millennials and the Creative Class have emerged to dominate the current work environment. This group has unique characteristics and possesses very different values and preferences compared to other generations. Given the significance of human capital
in innovation hubs, it is fundamental to study this demographic trend in order to understand how it may affect the development of such hubs in the future.

Recognizing the importance of innovation hubs and the major shifts in the entrepreneurial landscape, the goal of the thesis is threefold. Firstly, it uses Silicon Valley as a case to analyze the factors that have contributed to its success. Secondly, following urbanization and demographic trends, the thesis aims to find out how the new generation of workforce may influence the development of innovation hubs in the future. Finally, combining the success factors of Silicon Valley and emerging trends, the thesis identifies the factors that will have a crucial role in creating and maintaining the vitality of future innovation hubs.

Existing literature is used to analyze the model of Silicon Valley and the emerging trends from the entrepreneurial landscape. Two hypotheses are formed from the literature review, and they are tested through twelve in-depth interviews conducted with industry experts ranging from startup, global innovation corporation, investment, and architecture sectors. Following the analysis of the findings, key factors that will influence the development of future innovation hubs are identified, and a framework containing such factors is produced. The final sections discuss the study limitations, and the overall conclusion of the research.
Definition of Innovation Hub

Over the past twenty years, entrepreneurial companies and startups have become a recognized force in driving innovations and creating economic vitality. As such, a growing attention has given to environments that foster the creation of startup firms. Following the success of Silicon Valley, practitioners and policymakers around the world have become actively engaged in innovation hub development, and aim to create a Silicon Valley of their own. (Engel, 2014) (Ross, 2016)

Although innovation hubs have gained increasing momentum, the precise definition and features associated with such hubs have proven to be more difficult to tie down. (Freiderici & Toivonen &), 2015) Michael Porter, a Harvard professor and leading business strategist, once defined business clusters as “geographic concentrations of a critical mass of interconnected companies and institutions in a particular field, including suppliers, service providers, universities, trade associations, and so forth – whereby proximity leads to shared advantages through the aggregation of expertise and specialized resources” (Engle, 2014, p.9) This definition highlights the benefit of economies of scale achieved through physical proximity; but when applied to innovation hubs, it is important to extend the definition to the point that such concentration should not only be defined by industry specialization, but also by the stage of development and innovation of the cluster’s constituents. (Engle, 2014) (Lange et al, 2010)

It is clear that clusters of innovation are concentrations of interconnected companies that both compete and collaborate (Engle, 2014), and these hubs have a strong shared cultural belief in the
power of collaboration and risk taking (Barista, 2015). Recently, Brookings Institution has defined innovation hubs as "geographic areas where leading-edge anchor institutions and companies cluster and connect with start-ups, schools, business incubators and accelerator. These places are physically compact, transit-accessible, and technically-wired and offer mixed-use housing, office and retail." (Katz & Wagner, 2014, p.1) Through studying the existing innovation hubs across the US, three distinctive models are found (Katz & Wagner, 2014, p.1):

1. Anchor-plus model. These type of innovation hubs are found in downtowns and midtowns of central cities, where large-scale mixed-use development is centered around major anchor institutions and a rich base of related firms, entrepreneurs, and spin-off companies involved in the commercialization of innovation. Typical examples include Kendall Square, Cambridge, MA, Midtown, Atlanta, GA, and University City, Philadelphia.

2. Re-imagined urban area. Found near or along historic waterfronts, where industrial or warehouse districts have undergone a physical and economic transformation. These districts are usually powered by transit access and proximity to downtowns in high-rent cities, and are supplemented with advanced research institutions and anchor companies. Typical examples include San Francisco, Seattle, Brooklyn Nave Yard, and South Waterfront Boston.

3. Urbanized science park. Located in suburban and exurban areas, these traditionally isolated areas of innovation are urbanizing through increased density and infusion of new activities, such as mixed retail offerings. North Carolina’s Research Triangle Park serves a strong example of this model. Other examples include University Research Park, Madison, WI and UVA Research Park, Charlottesville, VA.
Looking at the past, many studies of startups or patenting have showed that some locations are hotbeds for innovation and entrepreneurship, while other areas are innovation deserts. The geographic distribution of innovation and entrepreneurship is very irregular throughout the world, and policy makers, entrepreneurs, and venture capitalists seek to understand why some innovations hubs have become more successful than others. Over the past fifty years, Silicon Valley is regarded as one of the most successful innovation hubs in the world, and its self-renewing character and superior growth have been widely admired (Engel, 2014) (Ross, 2016), and this chapter aims to use the Valley as case study to find out the key factors that have contributed to its success.

3.1. Silicon Valley Overview

Silicon Valley, originated from a small valley in northern California (the Santa Clara Valley) in the 1970s, covers now an area of 1800 square miles spanning the entire San Francisco Bay Area down to the Pacific Ocean cost at Santa Cruz. Started at HP’s garage, today the Valley houses approximately 14,000 – 19,000 startups and 1.7 – 2.2 million high-tech workers. (The Global Startup, 2015) (Engel, 2014), and it is home to leading Fortune 500 Companies such as Google, Apple, and Facebook. Just these three companies together have a market cap of $ 1.5 trillion. Even though the development of innovation hub has grown dramatically around the world, Silicon
Valley still captures about 45% of the Top 20 Startup Ecosystem1 Venture Capital investments and exit value, almost five times higher than its closest competitors – New York and London. The Valley has also one of the highest startup densities in the world, and due to its dynamic labor market, it has the shortest time (average of 40 days) to hire an engineer in the US. The ecosystem value of Silicon Valley (estimated value of all startups at or prior to exit) is estimated to be $264 billion to $323 billion in 2015, making it the leading startup hub internationally. (The Global Startup, 2015)

Imagine 1. Startup Ecosystem Ranking (The Global Startup, 2015)

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1 Excludes China, South Korea and Japan
Currently there are over sixty technology regions around the world that use the “Silicon” moniker. Examples include Silicon Alley (New York City), Silicon Wadi (Israel), Silicon Bog (Ireland), Silicon Allee (Berlin), Silicon Plateau (India) and Silicon Hills (Texas). Scholar Jerome S. Engel\(^2\) points out that in Silicon Valley, knowledge and commercialization are married to achieve an unrivalled pace of continuous innovation that rotates and exploits new ideas as they arise, and that the Valley is not a result of a strategically planned economic development by government, but rather of an organic growth that emerged from the compost of government investment in science and technology. As opposed to traditional industrial clusters that are composed of specific vertical industries (eg. car-manufacturing cluster in Detroit), the Valley benefited from its foundation as an industry cluster, and evolved into a notable horizontal cluster reaching across difference industries and sectors. In 2001, Silicon Valley employment concentration included seven high-tech industry sectors: biomedical, creative services, communication hardware, computers, electronic components, innovation services, semiconductors, and software. Rather than specializing in a single industry, the Valley specialized in the creation of new firms, namely startups that were aimed for the rapid development and introduction of new products and services. This movement has fostered an “Open Innovation” culture that facilitated collaborations beyond company borders, and accelerated the cycles for innovations. (Engel, 2014)

\(^2\) Senior Fellow and Founding Executive Director Emeritus of the Lester Center for Entrepreneurship at the University of California, Berkeley, USA
3.2. Silicon Valley’s Ecosystem

It is argued that the preconditioning of Silicon Valley goes back as far as to the founding of the State of California, and culture of the Valley is driven by many external factors that enhanced its natural attributes. An enterprising emigrant population was attracted by gold rush booms, and they were independent and individualistic risk seekers, who had tolerance of diversity and willingness to fail on the way to success. Simultaneously, fine Mediterranean climate and strong agricultural potential created fertile ground for the growth of a vibrant industrial cluster, which in turn became the foundation for the innovative ecosystem of the following century. (Piscione, 2013) (Engel, 2014)

Through analyzing the success of modern Silicon Valley, it is found that its core asset, the foundation element is its people – the human capital, followed by a set of hardware tangible ingredients. The Valley’s distinctive culture acts a software catalyst that brings the foundation element and hardware ingredients together, allowing them to interact and collaborate in an efficient manner. The subchapters below analyze each component of Silicon Valley in detail.

3.2.1. Foundation Element – People

The depth and breadth of Silicon Valley’s talent pool is a fundamental asset to the Valley’s continuous success, (Piscione, 2013) (Graham, 2006) and the idea that people will always be more important than institutions is critical in creating a healthy startup community (Feld, 2012).
The people at the Valley is not only highly educated and technically skilled, but they are also exceptionally innovative and entrepreneurial. According to Joint Venture Silicon Valley Institute, the earnings in Silicon Valley is significantly higher than the rest of California and the nation. As of Q2 2014, Silicon Valley recorded an average income of $116,033, compared to $96,663 in the 9-County Bay Area, $70,847 in California, and $61,489 in the United States. While the percentage of Silicon Valley residents having a bachelor’s, graduates or professional degree is 47%, compared to only 29% in the nation. (2015 Silicon Valley Index, 2015) The ZIP code 95054 alone, in the heart of Silicon Valley, produced over 20,000 patents, more than any other ZIP code in the US. (Engel, 2014)

Image 2. Median Household Income (Silicon Valley Indicators)
As Paul Graham, the co-founder of YCombinator stated that the key to establishing a great technology hub is having the right people, mainly two kinds – the rich and the nerds. (Graham, 2006) At the early stage of venture development, the “rich” would provide capital, and the “nerds” also known as the “super smarts”, would provide ideas to pursue. In the past, it is seen that the “super smart people” are drawn to the Valley by top universities such as Stanford and UC Berkeley, as well as by the quality of life and career opportunities after graduation. (Piscione, 2013)

Diversity of workforce is another major element that have helped to establish the creative environment of Silicon Valley, and formulate multiple levels of ties between the Valley and other innovation hubs around the world. According to SVCF (2013), the population of the Valley is 37% White, 30% Asian and 27% Hispanic, and over the past couple of decades, more than half of all the startups launched in the Valley have had immigrants on their founding team (Piscione, 2013). Silicon Valley Competitiveness and Innovation Project of 2015 further reported that 70% of Silicon Valley’s software developers were foreign born (The Global Startup, 2015). Many talented immigrants are attracted to the Valley to complete their education in leading research universities or seek employment opportunities in startups or mature corporations. These immigrants become involved in the entrepreneurial culture and add to the creation of new products and new companies. Thus, the immigrant population and influx of global talent together are viewed as critical human factors that have helped the Valley to reach to its commanding position in global innovation scene. (Piscione, 2013) (Kshetri, 2014)

In addition, Silicon Valley houses a group of world-class professionals specialized in supporting ventures to grow. Entrepreneurship is an admired profession in the Valley, and especially following the success stories of Google (Page and Brian), Apple (Jobs and Wozniak), and Facebook
(Zuckerberg), many of the best and brightest minds aspire to entrepreneurial careers. At the same time, the saturation of entrepreneurial role model creates a positive self-reinforcing cultural that inspires the young to pursue new ventures with expectations of global market penetration and influence. As such, professional entrepreneur supporters are held in high regards in the Valley, and they have a critical role in enabling the rapid scaling of young startups and accelerates the general growth of the businesses. Typically these entrepreneur supporters are accomplished individuals who specialize in building early-stage ventures and whose career paths are marketed by serial positions in a number of startups. They are augmented by professional entrepreneurial management classes, and they tend to specialize in working with startups of a certain size or stage, in specific industries where their functional expertise is primary and industry-specific experience secondary. They are a critical resource for early stage companies, and rather than pursuing traditional career path within one company, these individuals build a portfolio of equity appreciation opportunities by participating in the growth phase of multiple new ventures where they can make maximum impact. (Engle, 2014)

3.2.1. Hardware Ingredients

Educational Institutions and R&D Centers

It is widely agreed that the universities around the Bay Area have played a major role in the development of Silicon Valley. Many cutting-edge high-tech companies spanning through multiple industries have benefited from government funded science and engineering breakthroughs at Stanford, UC Berkeley and UC San Francisco, the three major research
institutions of the Bay Area. The University of California has the largest population of postdoctoral students in the world, with more than 60% coming from outside of the US. Meanwhile a 2012 Stanford study estimated that the university’s entrepreneurs have created over 5 million jobs and generated revenues of $2.7 trillion annually (Stanford, 2016). Supplementing these leading universities is a set of over 30 colleges and universities located around the greater San Francisco Bay Area, which all together provide an ongoing pool of talent. (Piscione, 2013), (Graham, 2006) (Engel, 2014) (Rosenberg, 2002)

Besides educational institutions, the Bay Area is rich with research and development centers. These centers may be funded by government, run in affiliation with universities, owned by major corporations, or function as independent businesses that spun out of university relationships. The research centers provide a deep reservoir of top technical talent, and they also foster their own active technology spin-out efforts. As a result, they provide solid contributions to the overall ecosystem of innovation hubs. (Kshetri, 2014)

Venture Capital

Rising money at the early stage is challenging, and investors are advised to recognize that they are feeders of innovation hub, and should take a long term vision to support the entire startup community. (Feld, 2012) Following these characteristics, seasoned investors and abundant supply of venture capital are well documented in Silicon Valley. The Valley’s VC ecosystem comprises a dense set of individuals and institutions that invest in a diverse spectrum of industries and business stages. Although by large, VC firms invest in late-stage, proven startups (The Global Startup, 2015), but in Silicon Valley, investors are more willing to invest in ventures that are in the
earliest stages of development, pre-revenue or even pre-product phase, and sometimes in unproven markets. Further, the Valley’s VC community is highly diverse, and investors tend to specialize by sector and stage. (Engel, 2014) (Rosenberg, 2002)

Both institutional Venture Capitalists and Angel investors are present in the Valley, and they often invest significant personal time in addition to their capital. Their personal involvement ranges from making introductions to assisting with negotiations and imposing governance through attending Board of Directors meetings. This high level of involvement and intimate advisory role are seen to be highly valuable for new ventures. (Engle, 2014)

The strong presence of VC firms located at the Valley has directly impacted the availability of capital to local entrepreneurs. The need for VC to be actively engaged in the growth and oversight of their portfolio investments has led to a preference to invest in their own geographic regions. As a result, it can be seen that given the concentration of venture capital investing in the Valley, currently the funding amount exceeds 40% of all venture capital invested in the entire country. According to PriceWaterhouseCoopers LLP and National Venture Capital Association, in 2013, out of $29.4 billion institutional venture capital invested in the US, about $12.1 billion (41.3%) was invested in Silicon Valley ventures. The sectors that received the most funding were the sectors of rapid innovation, namely software, biotechnology, media and IT services. (Engel, 2014)

Angel investors have also an active role in Silicon Valley, and they are often highly involved in the companies that they have invested in. This engagement leads to recycling of capital and expertise, and eventually contributes to the value creation of the entire ecosystem. Collaboration is a common practice among both Angels and institutional VCs, and this that has led to the
development of a highly cohesive and interdepend investment community where competitiveness is tempered with win-win allegiances. In addition, a critical element of successful venture investment is the ability to exit. This is accomplished through Initial Public Offering (IPO) process, or more frequently, through the sale of the entire company to a corporate acquirer. Such transactions are especially well supported in Silicon Valley, and there are specialized service firms, lawyers, accountants and investment bankers, who help to create paths to liquidity for venture investors and entrepreneurs. (Engel, 2014)

**Major Corporations**

Like other economic hubs, Silicon Valley is home to many leading global enterprises. However the notable difference of the Valley is that many of its major corporations are relatively young firms with recent entrepreneurial roots influencing their self-image and management practices. These companies (eg. Intel, Apple, Cisco, Google, and Facebook) are multinationals with strong market share, and they recognize the benefit derived from collaboration with emerging firms. Besides tech focused companies, Silicon Valley and the Bay Area also house large corporate headquarters ranging from industrial, financial, and consumer product giants such as Chevron, McKesson, Wells Fargo, VISA and GAP. Regis McKenna, a leading Silicon Valley marketing and strategy guru who has played a crucial role in the emergence of Apple and many other tech successes, mentioned that “About every 10 years there is a new industry that arises here in Silicon Valley. Of the top 15 companies (in the region), 12 of those companies were formed in the past 15 years, they generate $600 billion in revenues, and employ about three-quarters of the people in the Silicon Valley, and they were all entrepreneurial companies 15 years ago. So we continue to see this sort of churning and creating of new industries.”(Engel, 2014, p.77)
Service Providers

The pace of innovation in Silicon Valley is supported by a team of service providers who have tailored their professional skills and methods to facilitate the quick pace of change in startup environment and value creation over short-terms. Typically, the service providers include lawyers, accountants, investment bankers, accelerators, incubators, designers, recruiters and other specialize firms, and they have emerged together with the entrepreneurial culture and practices of the Valley. These firms help entrepreneurs to quickly deal with organizations and environments that are often asymmetrical to their early stage of development. (Engel, 2014)

A general availability of mentorship is another characteristic of Silicon Valley. As startups often seek guidance on growth strategies and business management, mentors can provide insightful perspectives, advices, contacts and inspirations to the funding team. Thus, the role of mentor is critical, and according to The Startup Genome Report produced, it is found that entrepreneurs with mentors have 3.5 more growth and raised seven times more money than those without. (The Global Startup, 2015)

Government

Government has played a prominent role in the emergency of Silicon Valley, and its ongoing support for technology commercialization has been one of the active ingredients contributing to the Valley’s continuing vitality. There are three aspects of government impact, namely provider of a stable environment, investor in technology commercialization, and enabler for regulations. Although these governmental aspects are not Silicon Valley specific, but their role and outcome
are essential in differentiating the Valley from other innovation hubs. (Engel, 2014) (Rosenberg, 2002)

Firstly, Federal and state government create a supportive legislative environment. The enforceability of contracts, the protection of intellectual property, the relative flexibility of employment law, and the relative simplicity of securities regulation, all together establish a climate where investors and entrepreneurs can operate without unnecessary uncertainty from non-business factors. Secondly, government serves directly and indirectly as an investor in individual ventures. Each year, through various agencies, the Federal government provides significant amount of funding in research grants to universities, which are then encouraged by law to translate commercializable research into intellectual property (via the patent process) and to transfer this property to private industry, typically through license agreements. The funding support from government may enable startups to develop their technologies to a point where venture capital investors find the opportunities attractive. Finally, government can restrict actions through regulations. The regulation of business practice is viewed especially crucial in protecting public safety and promoting fairness in business. (Engel, 2014)

3.2.3. Software Ingredients

The five ingredients discussed above formulate a solid hardware for Silicon Valley. However, equally important is its software, the culture and behavior that combine the foundation element and the hardware together, allowing them interact with each other in order to establish an efficient and innovative entrepreneurial climate. This unique intangible “software” has a crucial role in
contributing the Valley’s success, and it is this unique culture that has set the Valley different from other hubs. (Huang & Horowitt, 2012) (Piscione, 2013)

The software of Silicon Valley covers four key dimensions.

**Entrepreneurial Mentality**

Silicon Valley is a web of interactions, stimuli, connections, and re-combinations. It has an entrepreneurial culture that thrives on creative destruction and gets bored with the norm. Entrepreneurs appreciate the Valley’s tolerance to failure, odd ideas, contraptions and big dreams; as often, the future of markets and technologies lies in seemingly crazy ideas and visions. (Piscione, 2013) (Feld, 2012) (Kshetri, 2014) Openness to network and collaborate is another characteristic of the Valley’s culture, and this high degree of networking activities encourage unpredictable and serendipitous interactions between people and allow them to establish meaningful relationships. (Hwang & Horowitt, 2012)

In general, startups are seen to be risky ventures. Some studies suggest that even if the idea, team, product and plan are strong enough to gain VC funding, the failing rate is still approximately 75%. This phenomenon can be seen in many places, where talented and ambitions people are trying to establish startups, but eventually end up in failure. Paul Graham, co-founder of the leading startup accelerator YCombinator stated that “The problem is not that most towns kill startups. It’s that death is the default for startups, and most towns don’t save them.” (The Global Startup, 2015, p.18)

Silicon Valley, on the hand, has a unique supportive culture for young entrepreneurs, and it embraces risk-taking attitude, promotes open collaboration and shows understanding and appreciation towards failures. (Hwang & Horowitt, 2012) (Piscione, 2013) (Engel, 2014)
Silicon Valley is as much a culture as it is a mentality, and it self-reinforces through its success and uniqueness. The entrepreneurial process in Silicon Valley is characterized by rapid and continuous innovation, often capitalizing on technology commercialization, business model experimentation and new market creation. (Hwang & Horowitt, 2012) (Piscione, 2013) (Engel, 2014)

**Mobility of Resources**

Mobility of resources, namely money, people and know-how, are important to be set free to seek opportunities. At the same time, these resources should also be sufficiently committed to ventures in order to allow their value to grow. The interaction of mobility and commitment is delicate, and studies have shown that actively knowledge exchange is an important factor that has created a truly open and collaboration environment for Silicon Valley, and fostered its ongoing innovation process. (How to Innovate, n.d.) (Engel, 2014)

In Silicon Valley, there are abundant amount of examples that showcase mobility of resources, such as “the founding of Genentech through a shared vision of technologist Herb Boyer and venture capital Robert Swanson” or “Fred Terman’s role encouraging students like Bill Hewlett and David Packard, and establishing institutional structures at Stanford University to facilitate technology transfer that become models emulated by others”. (Engel, 2014, p.81) In all the examples, money, people and know-how were liberated from their previous constrains to pursue opportunities. In addition, to further enhance mobility, all notable universities in the Bay Area have dedicated offices of technology transfer, provide industrial collaborations, teach entrepreneurship, and have active outreach to venture capital community.
Global Perspective

It is found that high potential startups in Silicon Valley tend to take a global perspective from the start. This perspective can be expressed either on the demand or the supply side. On the demand side, ventures can quickly expand to address a global niche and reach to a global critical mass from the very beginning. Facebook is a clear example of this structure – it was launched locally at Harvard with a minimal viable product, and then spread virally locally, nationally and ultimately worldwide. On the supply side, firms seek to source product development, manufacturing or other talent from overseas at very early stages. The pervasive adaption of Internet and related opportunities such as new media and cloud computing services have further accelerated these trends. Through social media and other advanced technologies, international markets are easier to reach, and often, both startups and major multinational corporations of similar business practices are operating in a similar field. (Engel, 2014) (Hwang & Horowitt, 2012)

In addition, the diversity of workforce have enhanced the engagement of the Valley with foreign markets. Startups and corporate benefit as the immigrants bring a broad perspective and contribute to the global strategies; while at the same time, their personal knowledge of the markets in their home countries allows them to identify opportunities and bring in global networks and connections. In many cases, these entrepreneurs return to their home countries and employ what they have learned to capitalize opportunities there, and despite geographical distance, they maintain ties with entrepreneurs, managers, suppliers and customers in Silicon Valley. Thus, by housing a highly diverse group of entrepreneurs, Silicon Valley benefits from global perspectives and collaborations that have speeded and reduced the costs of innovation, and managed to position itself as an international hub in the growing network of connections around the world.
Further, international accelerators have also established offices in the Valley with a goal to ease market entry for their home country and host local integration. This types of migrations can result in the creation of strong bonds between home country and the Valley, with potential resources benefiting both the host enterprise and others in the innovation hub. (Engel, 2014) (Hwang & Horowitt, 2012)

**Shared Vision**

With high mobility of personnel and intellectual know-how, Silicon Valley is focused to establish shared vision and aligned interests between stakeholders in the community as well as to develop methodologies to retain the critical resources. Through employment and compensation strategies, employee reward is linked to the collective success of the enterprise, and these rewards are earned over time, typically over a four year period. Thus, in a successful venture, or one that holds the potential to succeed, retention is enabled. A typical employment contract with a Silicon Valley startup includes a stock option grant even for entry level employees. For senior executives, such grant can be up to several percentage point of ownership of the company. Such structure tent to align employees to work toward a collective win, rather than pursuing solely individual recognition. In addition, investment structures in the Valley encourages entrepreneurs to strive for the significant accomplishments. Certain provisions of venture capital investment as the vesting of founder’s stock, liquidation preferences and rights of first refusal incentivize entrepreneurs to stay with a venture and obtain sufficient capital gains so that their efforts are rewarded. Finally, Silicon Valley’s venture development is a staged risk taking. Through multiple rounds of financing, ventures are financed just sufficiently to achieve the next major milestone. This structure benefits both the investor and the entrepreneur, as the investor can limit capital at risk while maintaining
the option to invest more later on, and the entrepreneur limits the immediate ownership dilution. The financing strategy is a way to address high risks first and encourages startups to progress quickly. (Engle, 2014)
Changing Landscape of Innovation Hubs

Original Silicon Valley was created fifty years ago, and it had a long head start to create and develop a solid environment for startups. Today, economy is going through a different cycle, new industries are emerging, and profiles of innovators and entrepreneurs are changing. (Ross, 2016) Thus, the original Silicon Valley may not be entirely replicable or re-applicable. However it is important to understand the factors that have made the Valley successful, and learn the factors that will influence the development of innovation hubs in the future.

As discussed above, the foundation element of innovation hub is its people, the human capital, and in the past decades, there have been significant changes in the demographic landscape influencing the nature of this element. At the same time, urbanization is seen to be another powerful trend that influencing innovation hubs. Thus, the chapter below studies how the emergence of new workforce is linked to the urbanization movement, and how these two trends together may impact the development of future innovation hubs.
4.1. Emergence of Millennials and the Creative Class

Since Industrial Revolution, the world has undergone rapid changes. This change is not only caused by the development of internet, the rise of new technologies, or globalization. Under the surface, there is also socio-economic changes and the rise of creativity as a fundamental economic driver and the rise of a new social class, known as the Creative Class. (Florida, 2012) At the same time, the emergence of Millennials, individuals born between 1980 and 2000 are entering employment in vast numbers, and they will shape up the overall environment of work for years to come. According to the US Chamber of Congress, there are over 80 million Millennials in the US, and nearly a quarter of the population in the EU. It is estimated that by 2020, Millennials will form about 50% of global workforce. (Millennials at Work, n.d.) They are the most educated generation in history, and it is the first time that Millennials has outnumbered the Baby Boomers. (Stangler, D., & Spulber, D., 2013) (The Rise of the Millennials, 2015) (The 2016 Deloitte Millennial Survey, n.d.)

Both Millennials and the Creative Class share several similarities in values and preferences. Collectively, they span through science and technology, arts, media and culture sectors; and Richard Florida famously described that the distinguishing nature of the Creative Class is that its members engage in work functions that are to "create meaningful new forms". He defines the Class into two components of occupations. Firstly there is the Super-Creative Core group, which includes scientists, engineers, university professors, poets, novelists, artistic, entertainers, actors, designers and architects, as well as the thought leadership of modern society: nonfiction writers, editors, cultural figures, think-tank researchers, analysts, and other opinion makers. Beyond core,
the Class includes creative professionals who work in a wide range of knowledge-intensive industries, such as high-tech, financial services, the legal and health professions, and business management. (Florida, 2012)

Going forward, the ability to attract Millennials and the Creative Class is likely to be fundamental for innovation hubs, as this group represents a significant source of talent pool. The group tends to be uncomfortable with traditional corporate structures, and they expect a varied and interesting career path with rapid progression. Google and Apple, with their innovative culture and management style, are some of the most successful companies in attracting talented Millennials. (Millennials at Work, n.d.)

4.1.1. New Values & Preferences

Compared to the traditional workforce and other generations, the Creative Class and Millennials have unique characteristics, values, norms, attitudes and preferences. In order for innovation hubs to successfully attract and retain this significant talent pool, it is important to note the following key factors the group considers when choosing where to locate. (Florida, 2012)

Thick Labor Markets

Studies have shown that the old employment contract has broken down, and the idea of a job for life belongs to the past. Both Millennials and the Creative Class have tendencies not staying with a company over a long period of time. Thus, increasingly, people are attracted to locations that provide many and varied employment opportunities, a job market that is conducive to a horizontal career path. (Florida, 2012)
Lifestyle

Today, creative people pay great importance to quality of life, and they consider lifestyle alongside employment when choosing where to live. Certain scenes such as music, art, technology and outdoor sports can have an influential role on location selection. According to a comprehensive study “The Young and the Restless” by Joe Cortright and Carol Coletta, it is found that although jobs and economic growth are important, highly educated young singles have a great priority on quality of life factors. People have higher expectations on the places where they live, and the idea that certain places are for work and other places are for fun seems to be outdated. Simultaneously, due the nature of modern work and flexible and unpredictable schedules, people are increasingly demanding access to creation amenities on a just-in-time basis. Although going way for vacation still occurs, but other nearby, accessible amenities such as trails or parks have also become important. Noticing the trend, sociologists Richard Lloyd and Terry Nichols Clark of the University of Chicago point out “workers in the elite sectors of the postindustrial city make “quality of life” demands, and increasingly act like tourists in their own city.” (Florida, 2012, p.288) (Feld, 2012)

Nightlife is another important lifestyle component. For creative people (age from early 20s to 30s), the highest rated nightlife options are cultural attractions from symphony and theater to music venues and late-night dining. A wide mix of cultural attractions is viewed as a sign that a place “gets it”, and it is perceived negative if a city’s nightlife offerings close down too early, because increasingly people are having long work hours, and they prefer to have options around the clock. (Florida, 2012)
Social Interaction

Human beings need social interactions. However, with advanced technologies and flexible working lifestyle, some studies have shown that modern society has actually increased isolation. As human contact is harder to come by, the role of “Third Places”, places that are not home or work, but more like coffee shops, bookstores, become the core of a social community’s vitality. These are the places where people hang out simply for the pleasures of good company, and these type of places are seen to be especially important for Creative Class, and they make locations more attractive. Further, there is an emergence of “Fourth Place”, venues that integrate work and community. This types of places are created for people who prefer to work in an untraditional environment that has strong social elements, and they have the “just-in-time” settings designed to support the activities of fast moving, constantly changing teams. (Gensler Design Forecast 2016, n.d.) Real estate developers are responding to the need of the “Fourth Places”, and products such as temporary offices and meeting facilities have become available for rent on a one-demand basis. (Florida, 2012)

This trend can further be seen from the rising popularity of co-working spaces, and the solid performance of co-working companies such as WeWork has bought the company’s valuation to $16 billion, making it one of the top Unicorns to date, valued at $16 billion (Kessler, 2016) (Austin,S et al, 2015).

Dating Opportunities

People prefer to be in places where they have opportunities to find potential dates and life partners. This is an important element, and it is found that for young people, or older
people who are looking for a second change, the thickness of mating market is as important as the thickness of the job market. The chances of meeting a compatible partner is higher in some locations than others, and people are more likely to connect with others who share similarities such as race, national origin, religion, job, education, and lifestyle. Further, there are places that just have more singles, and amenities that bring single people together. (Florida, 2012)

Diversity

“Creativity requires diversity” (Florida, 2012, p.xi). Creative Class are drawn to places that are known for diversity and open-mindedness, and they enjoy communities that has a mix of ages, ethnic groups and races, as well as alterative appearances and sexual orientations. A diverse community sends a signal that it is open to outsiders, and that it is broad-minded and tolerant to various life choices. Diversity also relates to excitement and energy, and creative people enjoy a mix of influences, such as different kinds of music and different kinds of food. They enjoy meeting people unlike themselves and trade views and opinions over issues. It is worth to note that an attractive place does not have to be a big city, but it has to be cosmopolitan, a place where anyone can find a peer group to be comfortable with and other groups to be stimulated by. (Florida, 2012)

Authenticity

Millennials and the Creative Class value authenticity and uniqueness of places. Authenticity can come from several aspects of a community including historical buildings, established neighborhoods, a distinctive music scene, or specific cultural attributes. As the matter of
fact, music is found to be a key element in creating identity of a place and forming a real community. Technology and music scenes are also seen to go together, because they reflect a place that is creative and open to new ideas and new people. (Florida, 2012)

Scenes

Scenes are places where experiences are made and enjoyed, and it is found that authentic, locally grounded scenes help to establish a creative environment and attract creative talented people. These scenes have social and psychological dimensions, and studies have found that they can directly and indirectly contribute to local economies. (Florida, 2012)

Overall, it can be seen that the preferences of Millennials and the Creative Class are key characteristics of cosmopolitan centers. It is also worth to note that creative people do not move for traditional reasons. The traditional physical attractions that most cities focus on building, eg, sports stadiums and malls, are insufficient and sometimes irrelevant to attract them. What creative people are looking for are high quality amenities and experiences, an openness to diversity, and above all, opportunities to validate their identities. In order to develop a creative center, there needs to be an integrated ecosystem or habitat where all forms of creativity such as artistic, cultural, technological, and economic can be developed. (Barista, 2015) (Florida, 2012)

4.2. Urbanization

Urbanization is another factor that has caused significant changes in innovation hubs. (Basulto, 2014) (Katz & Wagner, 2014) In the past decade, cities have witnessed great growth, and a
significant number of people have moved back to downtown as part of the urbanization trend. With the increasingly global and interconnected world, it is estimated that about 54% of the world's population lives in urban areas currently. (World Urbanization Prospects, 2014)

At the same time, with the recent generation of consumer facing Internet ventures and the emergence of Millennials and the Creative Class, an increasing amount of startups have chosen to be located in city centers. This location shift can clearly be seen in the development of innovation hubs and technology centers. For example, compared to Silicon Valley, San Francisco has gained great momentum as a location for tech talent and new startups, and a number of highly publicized startups including Twitter, Square, Pinterest have all chosen to be located in the heart of the city. As a matter of fact, Twitter’s co-founder Jack Dorsey addressed the company’s choice to locate in San Francisco by saying that “I love the idea of an urban corporate campus with all the energy and variety that provides.” (Florida, 2012, p.322) (Khana, 2011) Imagine 3 shows the dollar value of venture capital investment across Bay Area zip codes, and the clear clustering phenomenon around San Francisco. (Florida, 2013)

According to Michael Evans, Managing Director at Newport Board Group, San Francisco has become the new place for startups, because founders do not want to commute to the South Bay, and they prefer to live where they work and work where they live. (Engel, 2014) This trend clearly demonstrates an urban shift, as in the 1980s, 1990s, and 200s, not a single urban center rivaled Silicon Valley as a center of high-tech startup community. Today, the emergence of innovation
hubs in cities such as New York, San Francisco, Boston and London, showcases that there is a solid return of people, jobs and commerce to the urban core. (Florida, 2013) (Siegel, 2012)

Image 3. Venture Capital Investment across Bay Area

4.2.1. Role of Place

Beside innovation hubs, some of the leading innovative companies are seeking urban locations as well. Google for example, has expanded beyond its Silicon Valley Googleplex, adding new centers in New York, London, Toronto, and other major metropolitan centers. According to “Back to the City” article from Harvard Business Review, there is a growing number of companies that have lost
their appetite for suburbs, and that businesses need to understand the trend and plan for it in the long term. Some experts have further suggested that this trend may provide advantages to New York over Silicon Valley, as such urban settings will have its own considerable virtues. (Florida, 2012) Dominic Basulto noted in Washington Post (2011) that, “some of the most exciting new startups over the past two years have been companies like Foursquare, Etsy, Tumblr, Gilt Groupe, Boxee and Kickstarter – all of which got their start in New York. (Basulto, 2011)

Together with urbanization, the role of place has become an important criteria for the creative workforce who has lots of choices to where to locate. Questions such as “what's there”, “who’s there” and “what’s going on there” revel crucial elements of the place itself, and the place is seen to be related to a set of experiences (Florida, 2016) that delivers a certain desired lifestyle. This ranges from street-level scenes to open space and creative product type offerings. In order to provide a desired lifestyle and attract creative talent, many emerging innovation hubs are looking to create a “spiritual center”, which includes an iconic building, public park, creative remake of historical structure, with spaces and amenities for all stakeholders and sometimes to the surrounding neighborhood. (Barista, 2015)

However, it is worth to note that quality of place does not occur automatically. Rather, it is an ongoing dynamic process that engages a number of disparate aspects of community. In addition, successful places do not have a single focus, but they provide a range of quality options for different types of people at different stages in their lives. Creative Millennials consists of a wide range of people with different backgrounds, ages, ethicalities, and they all have different preferences when it comes to lifestyle choices. In order to be successful, the place needs to offer something for to all segments. (Florida, 2012)
Overall, in the past fifty years, the landscape of innovation has been dominated by suburban locations such as Silicon Valley. However following urbanization and emergence of Millennials and the Creative Class, a contemporary urban model of innovation hub is expected to become increasingly popular. These hubs may be located in urban settings, featuring leading-edge anchor institutions, startup clusters, incubators and accelerators. They may also be physically compact, transit-accessible, technically-wired and offer mixed-use housing, office and retail components. (Katz & Wagner, 2014)
Hypotheses Formulation

Through reviewing the existing studies on Silicon Valley, it is seen that its “software”, namely the culture, is a critical element that ties all tangible hardware ingredients together. This culture has made the Valley a unique place, attracting talents all over the world to pursue creative ventures. Simultaneously, “people”, is the foundation element and one of the most valuable assets of the Valley, and its human capital has played a major role in formulating the Valley’s unique entrepreneurial climate.

With the emerging dominance of Millennials and the Creative Class in the work environment, it is important to study what kind of culture is desired by this new group. At the same time, literature suggests that the new workforce possesses different sets of preferences and values, especially towards location and quality of life. Thus, the thesis aims to find out whether location and lifestyle related amenities will play an important role for innovation hubs in the future.

Therefore, following the existing studies, two hypotheses are formed:

**H1.** The entrepreneurial culture, which has been a key intangible element to Silicon Valley’s success, will continue to play an important role in future innovation hubs.

**H2.** The new generation of workforce has a strong preference towards location and cosmopolitan lifestyle. Thus, compared to Silicon Valley’s suburban model, future innovation hubs located in the urban settings will become increasingly popular.
Methodology

In-depth interviews are used to test the hypotheses and to better understand the overall phenomenon of innovation hub development. This qualitative method is chosen for four reasons. Firstly, the in-depth interviews are considered to be more revealing in studying a new trend. Secondly, unrestricted opinions as well as perspectives and insights can be obtained from experts. Thirdly, interviews provide a comprehensive opportunity to ask additional questions in order to gain further dimensions of responses. (Burns & Bush, 2010) Finally, given innovation hub development is a relatively new topic, it is believed that in-depth interviews can be a solid way to identify additional variables and elements that may be tested quantitatively at later stage. (Hoepfl, 1997)

6.1. SAMPLING

In-depth interviews are conducted with experts from the following four industries. The profiles of interviewees are chosen based on their background and experiences from different areas of entrepreneurial ecosystem. The goal is to combine their unique insights of Silicon Valley and other innovation hubs in order to achieve a balanced analysis of the hypotheses.

1. Founders of Startups
2. Strategist of Leading Innovative Firm
3. Investors & Venture Capitalist
4. Architects
Twelve in-depth interviews are carried out. The sampling size is chosen based on the assumption that twelve in-depth interviews can offer a relatively wide range of diverse perceptions. In addition, it is expected that within the twelve interviews, certain repeating trends of opinions can be discovered.

6.2. CONTENT OF IN-DEPTH INTERVIEW

Four sets of in-depth interview questions are pre-designed based on interviewee’s background, and the interviews are conducted in a semi-structured format. Open-ended questions are mainly used to understand interviewee’s perspective and to support additional discovery. The duration of the in-depth interviewees is between 30min to an hour.
Twelve in-depth interviews have been carried out, and the table below illustrates profiles of each interviewee.

Table 1. Profile of Interviewees

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Occupation</th>
<th>Company &amp; Sector</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CEO &amp; Founder</td>
<td>Startup</td>
<td>Massachusetts</td>
</tr>
<tr>
<td>2</td>
<td>CEO &amp; Co-Founder</td>
<td>Startup</td>
<td>Massachusetts</td>
</tr>
<tr>
<td>3</td>
<td>CEO &amp; Co-Founder</td>
<td>Startup</td>
<td>Massachusetts</td>
</tr>
<tr>
<td>4</td>
<td>Founder</td>
<td>Startup</td>
<td>California</td>
</tr>
<tr>
<td>5</td>
<td>Director of Growth</td>
<td>Startup</td>
<td>California</td>
</tr>
<tr>
<td>6</td>
<td>Managing Partner &amp; Founder</td>
<td>Private Equity Investment &amp;</td>
<td>California</td>
</tr>
<tr>
<td>7</td>
<td>Director</td>
<td>Institute Investment</td>
<td>Massachusetts</td>
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<tr>
<td>8</td>
<td>Partner</td>
<td>Venture Capital</td>
<td>Massachusetts</td>
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<tr>
<td>9</td>
<td>Principal &amp; President</td>
<td>National Architecture Firm</td>
<td>Massachusetts</td>
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<td>10</td>
<td>Principal</td>
<td>Global Architecture Firm</td>
<td>New York</td>
</tr>
<tr>
<td>11</td>
<td>Associate</td>
<td>Global Architecture Firm</td>
<td>California</td>
</tr>
<tr>
<td>12</td>
<td>Strategist</td>
<td>Global Innovation Firm</td>
<td>California</td>
</tr>
</tbody>
</table>
7.1. HYPOTHESIS 1 – IMPORTANCE OF ENTREPRENEURIAL CULTURE

It is widely agreed among interviewees that the unique culture of Silicon Valley is one of the key elements that attracts domestic and foreign companies and talents. This culture continues to be a highly valued element for future innovation hubs. In particular, the following four characteristics of culture are found to be highly appreciated by today’s entrepreneurs and investors. Going forward, it is expected that innovation hubs need to demonstrate these cultural traits in order to attract talents and ventures.

**Openness**

On a general level, today’s entrepreneurs are attracted to environments where people are open to new ideas, and willing to make introductions and formulate connections. Networking effects are particularly strong in Silicon Valley, and this is a highly desired character among early stage companies. For international startup founders, it is also important to feel a sense of belonging, and they are attracted to places that is open to outsiders and easy to establish meaningful contacts.

**Supportiveness**

Throughout the twelve in-depth interviews, it is unanimously agreed that Silicon Valley provides some of the strongest support networks for entrepreneurs. As pointed out by startup founders and investors, such support is crucial for companies at a growing stage, because often, co-founders do not have the necessary business and management skills to scale their ventures. Thus, it becomes critical to have access to professionals who have
expertise in various types of business functions such as finance, sales and marketing, as well as mentors and advisors who are experienced in scaling startup companies.

Confirming the findings from existing literature, interviewees believe Silicon Valley is a showcase example of an innovation hub that provides comprehensive support network. Some startup founders have especially pointed out that in certain innovation hubs, such as Boston and New York, support is mainly available on a general level during initial stage, and it becomes more difficult to obtain during the development stage of ventures, when stronger personal involvement of mentors is required.

Forgiveness

Most of the interviewees have pointed out that compared to other innovation hubs, Silicon Valley shows a significant higher degree of understanding towards failure. Tied to its supportiveness, failure is a subject that can be openly discussed in the Valley, and to certain extend, the society possesses less pressure towards an outcome of a venture, and focuses more on the experience itself. Such tolerant and understanding mentality is found to be highly appreciated by entrepreneurs.

However, from funding perspective, some investors have noted that when analyzing such characteristic, it is important to look into the main business practices of each innovation hub. For example, compared to Silicon Valley, the entrepreneurial climate of Boston may be more conservative, but Boston is also more focused on life science and biotech sectors, which are, by nature, highly capital intensive and take longer time to grow. In such cases,
a potential failure is somewhat more “significant” compared to shorter term consumer facing ventures.

Risk-Taking Mentality

The willingness to take risks is perhaps one of the most distinctive element of Silicon Valley’s culture. This element is noticed by all startup founders, strategists and investors being interviewed, and they believe that people in the Valley, both founders and investors, are more open to take risks. Especially from funding perspective, both institutional and angel investors in the Valley are more open to invest in early stage ventures, and often they make investment decisions based on the venture idea, rather than short-term revenue projections. In addition, pointed out by some interviewees, the initial founding amount provided in the US is usually higher than other continents.

Overall, interviewees have pointed that the unique culture of Silicon Valley has attracted a high concentration of talents and high potential firms. Such a quality concentration of human capital is difficult to find in other innovation hubs today. Together with the rich funding environment, seasoned investors and the entrepreneurial mentality, Silicon Valley is expected to continue to attract ventures domestically and internationally. Going forward, the unique culture of Silicon Valley is also expected to be important in other innovation hubs, especially in terms of talent attraction.
7.2. **Hypothesis 2 – Importance of Location and Role of Place**

Following urbanization, service industries have expanded rapidly and city has become a pleasant place to live again. As interviewees from leading architecture firms have pointed out, since 2008, there is a significant shift to move back to the city center, and this trend is expected to continue in the near future.

Interviews reveal that the role of place, especially in terms of urban attributes, has become increasingly important for today’s workforce, and the main driver behind this phenomenon is the emergence of Millennials and the Creative Class. This group has become a core talented workforce in the society, and they place a high value on quality of life, commonly in urban locations. This workforce has distinctive preferences on social elements and urban lifestyle amenities; they enjoy to be surrounded by family and friends, and they show less concerns on car ownership.

As competition for talent becomes increasingly global, several leading innovative companies have started to respond to this demographic trend by establishing satellite offices in urban location. Examples include Google and Amazon, who have established regional offices in key metropolitan cities, such as New York and London. On other hand, some interviewees point out, as companies grow, no single destination such as Silicon Valley will be sufficient for business expansion. Thus besides the demographic trends, another driving force behind urban relocation may be simply because of a natural growth strategy – adding footprints in international gateway cities in order to enhance market reach and talent attraction.

Nevertheless, among startup founders and investors, it is agreed that there are definitely advantages to be located in the city centers, and these type of locations are particularly appealing
to the creative workforce. Some interviewees from California have seen a trend that a growing number of Stanford graduates (who choose entrepreneurial career path) tend to prioritize job opportunities in San Francisco as opposed to Silicon Valley. These young generation places a high importance on city living experience, including being close to social circles and having the convenience of commute. In addition, interviewees point out that the vibrant dating scene is an attractive element that draws people to city centers. New York is a great example that has benefited from the urbanization trend. Due to its established status as a global market, and 24/7 vibrant city life, startup founders, especially foreigners have shown strong preference towards its location.

However, it is found that, despite the advantages of urban location, economic related reasons such as cost of living may remain to be the fundamental driver behind location choices. Silicon Valley is well-known for its high living expenses, and for certain startups, especially the ones that are not technology focused, may choose to locate to other places simply due to affordability considerations. In addition, many talented people choose to work for established companies due to financial reasons such as income earnings or career prestige; while there are also others who choose to establish a progressive career path in certain startups that offer high level of challenge and responsibilities. In these scenarios, location choice becomes secondary. Further, innovation hubs that are located close to entrepreneurial institutions such as Silicon Valley and Stanford, benefit from the combined synergies, cutting-edge research resources and an ongoing generation of talent pool. These are elements that city center location along cannot provide.

A surprising finding from the in-depth interviews is that market reach offered by certain locations does not seem to carry a major role for startups. Many founders have stated that due to advanced
technologies, both domestic and international markets can be easily reached via internet, thus they do not consider heavily the physical market reach of an innovation hub.

Further, some interviewees point out that it can be easier for startups and smaller firms to move to city locations, while it is more challenging for bigger firms in the Valley, such as Google and Facebook to completely relocate to urban locations due to space limitations. Other interviewees have also suggested to carry out further study in the real motivations behind firm's relocation. As in the Bay Area for example, many firms move to San Francisco not only because of its city environment, but because the city has made more spaces available at lower cost.

Overall, the in-depth interviews confirm Millennial's preference for urban location, and some interviewees believe that in the long term, Silicon Valley's suburban location may become a disadvantage on a global scale. As innovation hubs continue to be developed around the world, places that possess rich and vibrant city environment such as New York and London, are expected to further grow and attract entrepreneurs. However, compared to other innovation hubs, Silicon Valley has had over 50 years of head start, thus it is has a well-established ecosystem and houses some of the most successful firms that will continue to attract and retain some of the brightest people. In the long term, competition of innovation hubs may intensify internationally, but it does not imply that Silicon Valley will lose its competitive edge due its location, but rather, the competition may create mutually beneficial synergies and win-win situations.

Importance of Amenities

Amenities featured in urban locations are viewed as part of the lifestyle experience Millennials are after, and interviewees have noted that today's workforce do desire to be living and working in a
24/7 environment. These amenities contribute to certain quality of life, and creative people appreciate various types of scenes, activities and entertainment a city center has to offer.

Besides traditional offerings such as restaurants, bars, theaters, dry cleaning services etc, new types of real estate products such as co-working and incubator spaces have become increasingly important for innovation hubs. As mentioned by startups and global architecture firms, these spaces are particularly useful for early stage companies, because they provide flexibility in lease terms and space requirements, at the same time, they create additional opportunities to network and collaborate with other firms. At the core, shared working spaces can function as social clubs for entrepreneurs. From master planning or city perspective, in order to support the overall development of innovation ecosystem, various types of spaces are needed to house various types of firms. For this reason, spaces such as co-working and incubators are developed to serve the needs of early stage companies, and other firms that are expanding to new markets. Although it is worth noting that some interviewees believe that such spaces are only short term solutions, because they do not offer sense of belonging. As companies grow and become less capital constraint, they may choose to move to more traditional spaces, where they can invest in their own spaces and create a company culture and identity.

However, interviewee from leading global architecture firm points out that, in the future, smart cities will be sharing cities, and it is important to unlock spare capacity a city may have. Even in highly dense gateway cities such as New York, sharing models such as Airbnb and Uber are very successful. Following the same trend, office sharing products such as co-working may also become important for innovation hubs, especially when today’s internet is helping to optimize spaces.
Overall, it is believed that innovation hub needs to be located in places where people want to live, and urban settings have become increasingly popular. Within the hubs, different types of lifestyle amenities are appreciated by the creative workforce, while commute and transportation facilities are expected to be some of the most important features a hub needs to offer.

7.3. OUTLOOK OF INNOVATION HUBS

Following the literature review and in-depth interviews, a framework containing the key factors influencing future innovation hub development is produced. (Image 4)

Following urbanization trend and the demographic change of the foundation element – people, today’s creative workforce shows great appreciation towards urban settings and cosmopolitan lifestyle. Thus, the role of place has become increasingly important, and it is estimated that the “place element” will become the sixth ingredient of the innovation hub hardware system. When planned and designed correctly, the place element can take on a supportive role in fostering entrepreneurial culture and talent attraction, as well as enhancing the overall competitive advantage of innovation hubs on a global scale. In addition, on the outer ring of the framework, the software, the culture, is believed to continue to play an important role in future innovation hubs. Besides the traditional cultural dimensions noted in the literature review (mobility of resources, global perspective and shared vision), the entrepreneurial mentality, especially in terms of openness, supportiveness, forgiveness and risk-taking attitude are found to be highly appreciated by all stakeholders within the entrepreneurial ecosystem.
Image. 4 Framework of Factors Influencing the Development of Future Innovation Hubs

- **Culture**
  - Supportiveness
  - Openness

- **People**
  - Universities + R&D Centers
  - Major Corporations
  - Government
  - Venture Capitalists
  - Service Providers

- **Place**
  - Mobility of Resources
  - Global Perspective
  - Shared Vision

- **Foundation Element**
- **Hardware Ingredients**
- **Software Ingredients**
Through in-depth interviews, industry experts believe that the role of place can become a special element that supports the creation of entrepreneurial culture and fosters collaboration among startups. The urban experience can be established through a mixed-use development model consisting of three categories. Firstly, having established infrastructure is essential, and this covers functions such as efficient public transportation and well-designed outdoor spaces and street level serendipity. Walkability is another key infrastructure element, and it is generally agreed that Millennials prefer to be located in highly walkable places that stimulate human interaction, and as a result fosters collaboration and innovation. Secondly, urban vitality, in terms of authentic scenes such as cultural, recreational offerings and lifestyle amenities, are seen to be highly attractive. Finally, a successful innovation hub needs to provide various types of spaces for companies at various stages. A healthy mix of new product types such as co-working and incubators are expected to be highly demanded in the future.

In addition, interviewees note that affordability, especially in terms of cost of living, is another crucial element that innovation hubs are advised to consider. As early stage startups are usually capital constraint, thus the fundamental economics, such as rent, can play a major role in location selection. Affordability of innovation hub is seen to be a macro-economic issue that requires partnership and inputs from both public and private sectors.

Overall, interviewees agree that as innovation hubs continue to be developed around the globe, there will certainly be more competition among themselves. Regions that provide a cosmopolitan, 24/7 lifestyle are expected to have great growth potential. While other countries such as China, which possesses a large domestic market, may become increasingly competitive as well.
The main limitation of the study is the lack of quantitative research. Through literature review and in-depth interviews, it is found that culture and role of place can play an important role in future innovation hubs. It would be interesting to undertake further quantitative research, such as questionnaires and surveys, to a well-designed group of respondents (e.g., above 100 people) and analyze the correlation and statistical significance of such factors. In addition, it would be insightful to conduct interviews with entrepreneurs located outside of North America, in order to enhance the global perspective of the research and discover additional trends and values possessed by entrepreneurs on a global scale.
Conclusion

The outlook of innovation hubs and the factors that assist them to succeed are crucial subjects that have not been widely studied. Through the case study of Silicon Valley, it can be seen that the core asset of a successful innovation hub is its people – the human capital. Adding to this element, the tangible hardware – Universities & R&D Centers, Venture Capital, Major Corporations, Service Providers, and Government – have an irreplaceable role in the development of such hubs. The software, culture and behavior (entrepreneurial mentality, mobility of resources, global perspective and shared vision), act as a catalyst that bring the foundation element and hardware together, allowing them to efficiently interact and cooperate. Ultimately, a vibrant innovative and entrepreneurial ecosystem is formed from the combination of all these factors.

For future innovation hubs, the hardware ingredients, especially the presence of investment capital and seasoned investors will remain to be the preconditions for success. At the same time, the software, culture, is estimated to continue to play a major leadership role in enhancing the vitality of innovation hubs. Entrepreneurial mentality, in terms of openness, supportiveness, forgiveness, and risk-taking attitude are found to be highly appreciated and desired by today’s entrepreneurs.

Following urbanization and the emergence of Millennials and the Creative Class, the role of place has become increasingly important, and the “place element” is estimated to become the sixth ingredient of innovation hub hardware system going forward. The new generation of talent pool
shows high appreciation towards urban locations and cosmopolitan lifestyle, and they are the people who have the choices to decide where to locate. Thus, in order to successfully attract and retain the talents in the future, it is recommended for innovation hubs to pay a great attention towards the role of place. When designed and produced effectively, the place does not only foster innovation and collaboration, but it can enhance an innovation hub’s overall competitiveness on a global scale.
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