17-20th of June 2012, Tallinn

IASP International Association of Science Parks

29th IASP World Conference 2012

Becoming Silicon Valley

Parallel Session 6

What are the STPs evolving into?

Author:

Richard Wallace (rwallace@thenextsiliconvalley.com)

The Next Silicon Valley, USA

Becoming Silicon Valley

Executive Summary
The Next Silicon Valley - Now a Global Quest

An inside look at five emerging innovation metro areas around the world, and the interests, networks and connections that sustain them.

Introduction

The age of cheap, inexpensive labor is now a movable commodity, heading west, in China, east in Europe and south throughout the rest of Asia.

In its place, a new age of knowledge is spreading rapidly, enabled by mobile devices, the Internet, and knowledge mobility itself.

Along the way the global economy is becoming more and more knowledge-centric, with new 'innovation destinations' emerging in diverse geographies and regions with increasing frequency, each having its own unique infrastructure, institutions, connections, networks and innovation economics.

The roots of today's global knowledge economy can be traced, in part, to Silicon Valley and that region's unique amalgam of Stanford University, Sand Hill Road and Highway 101, a place of modern legend where bright people, knowledge, technology, capital and good management have come together to create the world's most famous entrepreneurial region and economy

But owing to to the Internet, modern population mobility, and the rapid dissemination of technical knowledge worldwide, Silicon Valley's competitive advantage is no longer a monopoly, and the "DNA"of 'the valley' is being spread to cities and regions around the world, and with it, the forces that nurture and sustain innovation/entrepreneurial-driven technology development.

Often centered on a specific group of industries — like the automotive electronics industry in Bavaria, Gemany, or the life sciences cluster in Boston, the IT hub in North Carolina's Research Triangle Park, 'clusters' are one of the best ways for local communities to attract and develop high-growth businesses that create quality jobs while driving innovation-based regional wealth.

Reports show that companies operating within clusters create more jobs, pay higher wages, expand faster and generate more patents than isolated firms. New business formation is also centered within clusters, and start-ups in a strong regional cluster grow faster.

Within this regional context of emerging innovation destinations, science and technology parks the world over are emerging as unique innovation destinations that can generate a critical mass of research, development, technology commercialization and entrepreneurship needed to support and sustain tech-based economic development.

To get a better look into, and feel for some of these emerging regional innovation destinations let's take a look at five unique centers around the world and drill down a bit into the institutions, infrastructure, interests, networks and connections that sustain them.

This paper draws upon published reports about these and other 'innovation destinations' published in online news reports in The Next Silicon Valley website (www.thenextsiliconvalley.com) over the past two years. It includes edited versions of previously published contributed articles, aggregated news articles and original reporting. The list implies no ranking or specific rating of these cities and regions which have been selected expressly by the author to highlight and illustrate the trends, developments and current events shaping innovation destinations around the world as they replicate, or aspire to

replicate, a confluence of complex factors, conditions, interests, networks and connections that sustain them and propel them into next Silicon Valley status.

New York, NY

As international cities go, New York City has not, historically, had a very high technology or innovation profile. Renowned as a world financial center, media and publishing capital of America, advertising mecca, fashion and art capital, New York has not been a place known for tech innovation or entrepreneurship.

What little technology may have been developed in New York City in past decades, much of it was mathematical and computer science output generated by so-called 'rocket scientists' that went into Wall Street weapons of mass financial destruction like credit swap defaults and collateralized debt obligations.

Nearby Boston, Massachusetts, home of the Massachusetts Institute of Technology, Harvard University, Northwestern and many other science and technology oriented universities made Boston a closer Silicon Valley rival than New York, especially during the decades of the 80s and 90s through the emergence and growth of the personal computer industry.

All of this is about to change, and today New York City is poised to emerge in the decade ahead as one of the U.S.'s leading centers for innovation driven, entrepreneurial activity.

Behind this surprising transition are a number of factors, first among them the economic turmoil in New York's core financial industry brought on by the 'Great Recession'. Next is the political will of current mayor and economic visionary Michael Bloomberg.

No stranger to Wall Street, Bloomberg was the founder of Bloomberg L.P. the American multinational financial news corporation.

The initiatives and programs that Bloomberg, his administration and its regional supporters are laying down are expected to form the foundation for an innovation renaissance in the City of New York, one marked by with typical NY chutzpah and cheek – and confidently aimed at knocking Silicon Valley itself into the number two position as the U.S.'s leading center of technology development and entrepreneurship.

Recently NY's bold vision and ambition came a step closer to realization following a global competition among academic and research institutes mounted by the city aimed at attracting new partners to convert the unused Roosevelt Island in Manhattan's east River into new applied sciences and engineering school on Roosevelt Island to rival MIT and Stanford.

Helping to buoy the city's ambitions is a new wave of employment growth underway in the New York Metro Area. Behind the latest wave of new job growth is a surge of new innovation-based high tech startups that's taking advantage of New York's core tech infrastructure, and repositioning New York as a 'next Silicon Valley.'

This is an important development for the region and a major departure from New York's historical reliance on multinational corporations for job and opportunity creation.

Until recently New York took a back seat to Boston and many other major U.S. cities on the tech development and innovation front.

And ever since Bill Hewlett and David Packard launched their electronics company, HP, in a Palo Alto, California garage, the West Coast, especially Silicon Valley, has eclipsed the entire

East Coast, especially New York, as the go-to destination for innovation and high technology startups.

All that is changing, and today dozens of US cities are vying with 'The Valley' for high tech startup bragging rights. Recently the New York Metro Area has emerged as a powerful magnet for technology startups which find the region flush with bright, young, highly skilled, tech savvy recent college graduates, ample smart new ideas, and plenty of venture capital needed to finance and nurture new technology enterprises.

New York's hottest tech hub has bypassed stodgy Midtown for the hipper Flatiron and Chelsea districts, which are buzzing with the kind of high tech fever once only found in Palo Alto, or along Boston's Route 128 corridor.

Helping anchor, and fuel, the NY tech scene is none other than Silicon Valley giant Google which operates a sprawling research and development center of nearly 1 million square feet between 9th and 10th Avenue and 14th, 16th Streets. Inside its block-long corridors hundreds of young programmers and engineers work in Dilbert-like cubicles in a colorful, playful, distinctly NYC loft-like environment, fueled by java, jelly beans and all of the motivational perks more closely associated with the tech giant's Mountain View, CA headquarters. It's all part of the new, New York tech culture.

New York's tech fever is being supported and aided by several new tech startup incubators like the Enterprise Roundtable Accelerator program, TechStars, and NYC SeedStart. Media, advertising, and information technology companies are leading the high tech startup charge.

To track New York’s latest wave of innovation activity New York Mayor Bloomberg recently launched the New York City’s Innovation Index, said to be the first composite indicator that charts overall innovation activity in New York City over time. The index, developed and administered by the New York City Economic Development Corporation, provides a detailed analysis of the drivers of innovation in the City and how they are faring. The data will be updated every year and will be used to measure the scale and pace of the City’s economic transformation, as well as inform policies and shape a regulatory environment that promotes innovation in New York City.

By analyzing the City’s innovation inputs – research and development (R&D) spending, finance, and human capital – and innovation outputs, or the growth of intellectual property, production in high-tech sectors, and entrepreneurship, the Innovation Index uncovered key trends in New York's innovation economy:

- The high-tech sectors’ share of the gross city product (GCP) increased by almost 25% between 2003 and 2009. In 2009, GCP per worker in the City’s high-tech sectors was more than $200,000, among the highest level of any sector.

- Venture capital funding in the New York metro area totaled $1.9 billion in 2010, with firms in the City accounting for 64 percent of this activity. Both the number and value of VC deals increased at a significantly higher rate than in the rest of the nation between 2003 and 2010.

- New York City’s small businesses received a total of $30 million in federal grant dollars for innovation and research in 2009. The value of grants to the City’s firms more than doubled between 2003 and 2009.

- The City’s universities invested $1.8 billion in R&D in 2009. R&D spending at these institutions increased 13 percent since 2003 and accounted for approximately 3.5 percent of all academic R&D spending nationally.

- In 2009, the City's universities were home to nearly 27,000 graduate and post-doctorate students in the science and engineering disciplines. This represented a 3.9 percent share of all such students in the U.S. and is up from 3.5 percent in 2003, demonstrating the City's learning and research institutions' growing influence in these fields.

- With nearly 179,000 people employed in science and engineering occupations in 2009, the City's workforce is becoming more concentrated in these jobs. The number of workers increased by 9 percent between 2003 and 2009, while their share of total private employment grew by 4 percent.

- There were approximately 1,100 patents awarded to New York City inventors in 2009, an increase of 23 percent from 2003.

Overall, the index documents that barriers to business creation for high-tech and innovative firms are lower today than they were a few years ago, and they continue to decrease, as more entrepreneurs are attracted to the city. The published results of the index show that within the broader city economy, entrepreneurs are establishing new businesses, and more startups are securing venture capital and federal funding. This development is facilitated by the concentration of highly skilled talent across numerous industries, providing an ideal environment to exchange ideas. The city's universities continue to be the engine driving research and knowledge creation, helping to develop a highly skilled workforce.

It also considered the results of its own Select Regionals Survey as a criterion to select the 100 locations that made the final cut. This survey, sent to nearly 300 U.S. regions and metros, considered the areas' top three greatest project investments of 2010, unemployment rates, and total capital investment pledged over the past year.

Flanders, Belgium

The Flanders region of Belgium is another good example of a region rich in academic and industrial resources focused on innovation and technology development.

Among these resources, imec (Interuniversity Microelectronics Centre) has emerged as a world-class micro- and nano electronics research center headquartered in Leuven, Belgium, with offices in Belgium, the Netherlands, Taiwan, USA, China and Japan. Its operations encompass over 1,900 people and include more than 500 industrial residents and guest researchers. In 2010, imec's revenue (P&L) was 285 million Euros.

Imec, which has helped shape the future of the semiconductor industry with its university and R&D partners for more than 25 years and is now helping Flanders replicate that successful R&D partnering model across other industry sectors, and across other Flemish and regional research institutes, making this region a prime destination for investment in innovative research and development, worldwide.

There was a time when Silicon Valley's semiconductor industry was wholly sustained by company R&D and by U.S. government supported research in a number of national research labs. But as semiconductor development and manufacturing in Silicon Valley has been displaced by software and Internet-based technologies and companies like social networking like Facebook, new technology development opportunities have emerged in other regions of the world.

Imec's unique public-private based semiconductor R&D charter is also driving the organization's innovation and tech development activities far downstream of its original CMOS semiconductor and EUV lithography research charter.

Increasingly, imec is delivering innovative contributions in a wide range of fields beyond semiconductors, including materials research, health care, the smart grid, alternative energy, organic solar cells, solid state lighting, nanoparticles, in-vitro and in-vivo cell interfacing platforms, neuro-electronics brain research, next generation vision systems, and hyperspectral imaging, to name a few.

Overshadowed and somewhat overpowered by European tech-economic rivals France, Germany and the UK, Flanders is emerging as a 'poster region' for open innovation on a global scale as well as a region to watch in the area of world-class technology-based economic development.

In recent years FDI magazine ranked Flanders #1 in 'FDI Strategy' among 25 regions across all of Europe.
Through well funded and intelligent government investment and support at the regional level, Flanders and its technology partners are writing new chapters in the global innovation handbook and effectively demonstrating the value of public-private cooperation in the realm of 21st century research and development practices.

Imec's R&D footprint reaches not just beyond chips, but also well beyond Flanders' borders, with imec centers now established in Taiwan, Japan the U.S. and, as recently reported in a TNSV report, IMEC plans Zhangjiang High-tech Park R&D center: China. Imec's staff is comprised of more than 1,750 people and includes over 550 industrial residents and guest researchers. In 2008, imec's revenue (P&L) was 270 million euro.

Imec's focus on next generation semiconductor and electronics research, three to ten years ahead of industrial needs, and its "strategic research organization" model has positioned Flanders at the leading edge of global innovation.

Bangalore, India

India, especially Bangalore has a global reputation as a world-class outsource center for business process automation. But in recent years this pleasant, green city in the south of India has begun to emerge as a leading technology center for research and development across a broad range of industries, from biotechnology to semiconductors. Like emerging Silicon Valley clones elsewhere, one of Bangalore's core strengths is a large, diverse population of well-educated engineers in science, technology and maths.

Bangalore Helix, an emerging 56-acre biotechnology park in Bangalore's Electronics City is just an example of the kind and scale of tech investment projects which have helped the region to sustain and attract major biotech investors from across the world.

In recent years some of Silicon Valley's top venture capital firms have found there way to Bangalore, and the region is undergoing a Silicon Valley-like boom in deal making and tech company formation.

VC's and entrepreneurs in the region have also begun to develop and invest in is a basket of emerging technologies - including alternative, clean energy technologies; low energy technologies, including batteries, light emitting diodes (LEDs), solar cells and other photovoltaic technologies and wind energy technology.

Bangalore, over time, is shedding its BPO identity and becoming a regional center for the design and development of many new technologies.

Local observers have also identified a number of key and emerging tech sectors for future growth in digital media technology, including 3D and augmented reality predicted to drive a new generation of consumer devices such as 3D LED TVs and 3D games.

Regional observers see some of these as "new trillion dollar product categories" and predict that ongoing developments in systems, software and devices will drive new VC investment and opportunities from semiconductors devices to new Internet connected appliances.

VC firm Sequoia Capital India, one of Silicon Valley's most prominent funds has reportedly earmarked $500 million to $600 million over the next couple of years to invest in Indian companies focused on the internet mobile, specialized retailing, telecom and the knowledge process outsourcing sector.

Sequoia Capital India has stated that it expects its India's venture capital business to grow further from its current $15 billion to $20 billion size. Sequoia has already invested $600 million to $700 million in 40 Indian companies including Cafe Coffee Day, Idea Cellular, Paras Pharmaceuticals, shaadi.com, SKS microfinance. India's venture capital business is expected to grow further from its current $15 billion to $20 billion size.

It has been said that VCs hope the Indian government recognizes the fundamental need for information infrastructure and would push and deploy the most advanced broadband in the world.

Broadband is the fundamental building block which will catapult India's GDP for the next 50 years with a potential to create more than 250 million new jobs.

"It is totally in the governments' hands. VC's are waiting for government policies to build the basic broadband infrastructure," Bob Kondamoori, seasoned VC and partner of Bangalore-based VC firm Sandalwood Partners recently noted.

But there's a cautionary note. Without a crystal clear and well defined government policy and plan to attract private equity, India will struggle to get its share of VC and PE thru 2012, observers warn, noting that, unlike the last five years, there are too many new and excellent opportunities for private equity to go back to Silicon Valley and other innovation destinations.

Dresden, German

Tucked at the edge of eastern Europe in the German State of Saxony, the city of Dresden has a long, rich academic and industrial history that has helped position this region as an important link in the global semiconductor design and supply chain.

Within Germany, Berlin has a younger, hipper startup scene, Munich has a bigger more mature industrial base, and Frankfurt commands more attention on the financial front. But Dresden, against considerable odds, has managed to create a critical mass of innovation, much of it in support of the global electronics and semiconductor sectors.

Like aspiring Silicon Valley's worldwide, Dresden has established a vital network of regional and global connections that tie together into a coherent innovation hub a series of science and technology parks, business services, R&D centers, startup hubs, investors, universities and tech clusters.

The Free State of Saxony is the tenth-largest German state in area (18,413 km^2) and the sixth largest in population (4.3 million), of Germany's sixteen states.

Microchip makers near Dresden have given the region the nickname of "Silicon Saxony." It's an apt moniker as the region has important holding in both solar-related and electronics related semiconductor design, manufacturing and processing.

As an example of the region's connection to the global innovation and technology development chain, Global Foundries recently teamed up with ARM Holdings to develop a new System-on-a-Chip based on the ARM Cortex
A9 processor and Global Foundries' High-K Metal Gate 28 nm fabrication process. This new design is expected to become an important competitive factor in the global smartphone market.

Saxony is home to several world-class research institutes, including the Fraunhofer Institute for Photonic Microsystems (Fraunhofer IPMS), a research network designed to close the gap between mostly academic basic research and product-oriented application development. With 240 researchers and engineers, IPMS is one of the top research institutes focusing on sensor and actuator systems — one research topic of IPMS is micro mirror arrays for photolithography applications in next-gen semiconductor production landscapes.

According to Invest in Saxony around 13,000 people are employed in the region's railway technology industry. About 9,000 of them work in the 54 largest enterprises, which form the core of this branch as system providers and direct suppliers and generate a turnover of approximately one billion euros.

Wellington, New Zealand

Twenty years ago Wellington was a sleepy backwater populated by grey-suited bureaucrats and seriously lacking in good coffee. Now New Zealand's capital city absolutely positively hums with life and is regarded as a rising barometer for the South Pacific island nation's emerging digital creative wealth.

Wellington's international reputation for creativity took a leap forward when Oscar winning director Peter Jackson established operations in the city over a decade ago. Jackson operates an enormous production facility two minutes drive from the city's downtown airfield, where he parks his corporate jet. Hits such as Lord of the Rings and King Kong came to life there and filming of The Hobbit is now underway. Jackson also has a stake in highly acclaimed studio Weta Digital that famously provided digital effects for science fiction blockbuster Avatar.

"New Zealand is finally garnering the interest of some prominent global investors it seems." What is less well known about Wellington is that, amidst the high profile movie industry, the city also has a burgeoning web and software start-up scene that is determined to go global despite its distance from world markets. With a geography and climate not dissimilar to San Francisco, visitors to the harbor capital find themselves captivated by intriguing street sculptures, a rugged coastline and airy civic spaces. So it's no surprise that Wellington continues to attract large numbers of creative individuals to work in both the film and software industries. Skilled migrants founded half of all recent tech start-ups in the city.

Seb Marino is an Oscar winning CGI effects artist and researcher who made the jump to light speed and headed down under to work for Weta. Now he's founding a hot web based company called 77 Pieces that provides 3D visualizations to designers. There must be something in the water. Designer and developer Dave ten Have splits his time between Wellington and San Francisco where his company Ponoko now has an office. In 2009 he made the cover of Inc magazine talking about his VC funded social site for designers.

Wedged between jutting mountains and a gorgeous natural harbor that regularly plays host to dolphins and orca, Wellington seems to revel in its stunning natural environment and is

consequently a magnet for creative and entrepreneurial ex-pats. Wellingtonians are hardy innovators who love doing business in the trendy cafes that now proliferate around town, whilst building open communities that underpin the start-up scene. Unlimited Potential is the city's tech business network for I.T. professionals and runs an annual showcase event for web entrepreneurs, researchers and investors called Wellington to the World (W2W). The event recently featured 77 Pieces and a bunch of other emerging web companies.

Clearly there is no shortage of good ideas. In fact local economic development agency Grow Wellington runs a Bright Ideas competition which last year saw over 1200 entries. But ideas on their own are not enough and attracting greater capital investment down under is a vital step in driving new creative business opportunities. The city has a small but active angel network and is home to a couple of venture capital firms, but deal flow is not as strong as it might be. However New Zealand is finally garnering the interest of some prominent global investors it seems.

Controversial PayPal founder and Facebook seed investor Peter Thiel recently made two investments in Wellington based companies through his Clarium fund and New Zealand tech firms have reportedly been taking introductory calls from a number of leading VC companies in the Valley. The New Zealand government has a co-investment fund, but only a few deals have been inked, with B and C rounds being almost non-existent for creative companies that need growth capital. In a country that has a stable political system and a welcoming environment for business, that seems like a huge untapped opportunity.

Earlier this year New Zealand launched something called the Kiwi Innovation Network (KiwiNet), an online innovation database said to enable businesses, entrepreneurs and investors worldwide to view a diverse range of technologies and expertise in New Zealand's research organizations. The KiwiNet Innovation Database aims to facilitate collaborations between complementary technologies and increase investor and industry connections by showcasing the commercialization capability and distinctive portfolio of innovations New Zealand has to offer.

KiwiNet, a consortium of New Zealand research organizations dedicated to taking a collaborative approach to research commercialization, designed the database to act as a shop window to view up-to-date research projects, inventions and patents from across New Zealand.

Andrew Turnbull, a KiwiNet director says, "The KiwiNet Innovation Database is designed to jumpstart the transfer of research technology to the marketplace by bringing together science and business. We have a wealth of innovations in our universities and research institutes and by opening up access and working together we can unlock great value. “Examples of projects seeking investors or industry involvement range from bio pesticides and biologically based growth promotants, to artificial muscle materials which can allow users to power and wear devices, to unique electrochemical cells which allow cheap and effective removal of contaminants to provide clean drinking water for cattle.

KiwiNet, which receives support from the Ministry of Science and Innovation as part of its commitment to commercialization, will leverage the database through international portals to provide heightened exposure and visibility for New Zealand research.

Dr Gavin Ross, General Manager Business Development, Plant & Food Research, a KiwiNet member says, "Visibility and connectedness are vital to successful technology transfer. KiwiNet's national innovation portfolio approach creates greater scale and credibility, which will help us promote our technologies on the international stage. By working collaboratively we can also identify opportunities to combine complementary technologies to create more investable propositions." The first release of the database contains innovations from many of New Zealand's research organizations including KiwiNet members, Plant & Food Research,

Otago Innovation Ltd the commercial arm of the University of Otago, Lincoln University, AUT Enterprises the commercial arm of AUT University of Technology, WaikatoLink the commercial arm of the University of Waikato, AgResearch, University of Canterbury, Industrial Research Ltd and Viclink the commercial arm of the University of Victoria along with projects from, Scion, UniServices and Landcare.