



Nordic Dreams

Innovation, Startups, and the Nordic
Region's Connection to Silicon Valley

August 2017

Acknowledgments

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About the Institute

Since 1990, the Bay Area Council Economic Institute has been the leading think tank focused on the economic and policy issues facing the San Francisco/Silicon Valley Bay Area, one of the most dynamic regions in the United States and the world's leading center for technology and innovation. A valued forum for stakeholder engagement and a respected source of information and fact-based analysis, the Institute is a trusted partner and adviser to both business leaders and government officials. Through its economic and policy research and its many partnerships, the Institute addresses major factors impacting the competitiveness, economic development and quality of life of the region and the state, including infrastructure, globalization, science and technology, and health policy. It is guided by a Board of Trustees drawn from influential leaders in the corporate, academic, non-profit, and government sectors. The Institute is housed at and supported by the Bay Area Council, a public policy organization that includes hundreds of the region's largest employers and is committed to keeping the Bay Area the world's most competitive economy and best place to live. The Institute also supports and manages the Bay Area Science and Innovation Consortium (BASIC), a partnership of Northern California's leading scientific research laboratories and thinkers.

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Executive Summary

The Nordic Entrepreneurial Landscape

The San Francisco Bay Area, which includes Silicon Valley, is widely considered to be the world's leading center for technology, innovation and entrepreneurial activity. Its assets in research, sector concentration and risk capital work together to create a global innovation platform, making the Bay Area/Silicon Valley region a magnet for both large and small companies from around the world. In this respect, the Bay Area is a hub that connects to other global knowledge-led regions, inviting companies and countries to access and leverage its resources in order to better compete and grow globally.

European companies fill that landscape. While numerically that flow and the economic activity it represents is led by Europe's largest economies, the economies of the Nordic region (Sweden, Norway, Finland, Denmark and Iceland) punch far above their weight, with a disproportionately large impact and business presence relative to the size of their populations and economies.

Innovation Advantage

The Nordic region's economies place high on global innovation rankings. Sweden, Denmark and Finland place consistently among the top ten.

While each has its distinctive traits and assets, the Nordic countries share several elements in common. These include highly educated societies, with less income inequality than most developed economies; high-quality universities; and strength in scientific research. Sector strengths in their economies build on this foundation. All of the Nordic countries have small populations with correspondingly small domestic markets, which makes thinking globally a necessity. From the outset, many Nordic companies and their governments tend to look outward when it comes to global competition and markets.

Startup Hubs

The startup bridge to the Bay Area is anchored in a handful of major cities that have emerged as key startup and entrepreneurial hubs. These are the places

where the Bay Area's European startups primarily come from and where future partnerships are most likely to develop. Stockholm is one of Europe's five leading startup centers. Helsinki and Copenhagen also figure prominently. All Nordic capitals, including Oslo and Reykjavik, are developing increasingly robust and active startup environments.

From Startup to Scaleup

A 2016 Startup Europe Partnership (SEP) analysis of ICT scaleups in the five Nordic countries ("Northern Lights: ICT Scaleups in the Nordics") identifies 430 (defined for SEP's analysis as companies that have raised more than USD 1 million) and have together attracted USD 6.5 billion in investment. Sweden accounts for the largest number with 149, and USD 3.4 billion in investment. This puts the total number of Nordic scaleups on a par with the UK, and with Germany and France together.

Some of these companies have become global players, including Supercell, Spotify, King.com, Klarna, iZettle and Zendesk. Gaming is a particularly strong sector, but a growing number of companies can also be found in software, digital media, fintech, and hardware. Twenty Nordic scaleups have moved their headquarters abroad, primarily (75 percent) to the US, with the balance in leading European centers such as London and Berlin; most continue to maintain significant operations in their home countries.

The lion's share of this activity is occurring in major cities: Stockholm (with USD 3 billion raised by 90 scaleups), followed by Copenhagen (USD 1 billion raised by 70 scaleups), Helsinki (USD .8 billion raised by 83 scaleups), Oslo (USD .4 billion raised by 33 scaleups), and Reykjavik (USD .1 billion raised by 13 scaleups).

Sweden in particular sits prominently on Europe's investment map. In 2016 the UK, France, Germany and Sweden led Europe in both the number of investment deals and investment volume, with the greatest jumps in funding from 2015 registered in France and Sweden. In 2016, Sweden saw a record number of investment rounds and capital raised—twice the number of 2015.

Sector Strengths

The Nordic region's economies stand out as early adopters of cloud computing, enhancing their innovative capacity and digital competitiveness. Finland, with strong IT, telecommunications, and mobile gaming sectors, has Europe's highest rate of cloud adoption; by one estimate, half of Finland's economic activity will be digital by 2025. Sweden and Denmark join Finland on the short list of Europe's top adopters.

Sectors where the Nordic region shows strength across the board include e-commerce, software, fintech, life sciences, and entertainment in Sweden; gaming (computer and mobile), e-commerce, software, and health in Finland; software, bio-pharma, and renewable energy in Denmark; biotech, software, and IoT in Norway; and games and virtual reality Iceland.

The growing energy of the Nordic startup scene can be seen in the Slush conference held each winter in Helsinki. The 2016 conference attracted 343,000 visitors and 17,500 participants, two-thirds of them from Nordic countries. That included 2,336 startups and 1,146 investors. Slush organizers chartered an aircraft to fly participants directly from the Bay Area.

Systemic Challenges

As in much of Europe, Nordic startups face two major systemic challenges: access to capital and limited market scale. Both factors draw them to the Bay Area.

Funding

While the Nordic region enjoys active angel investor communities and ample seed funding, Series A funding is hard to find, and Series B or C (growth funding) is even more difficult to secure. Most venture firms and the levels of funding they can provide are small compared to Silicon Valley.

Market Scale

Even large European economies such as France or Germany lack the scale of the US market. This is a particularly large issue for the smaller economies of the Nordic region. For startups whose highest ambition is to

lead in their home markets, there's no problem; but for companies that want to become global players, this is a challenge. It is particularly the case for IT companies where the scale of the US market greatly exceeds that of all European markets combined. As a result, once startups have consolidated a base in their home markets and want to grow, many leapfrog Europe and come to the United States—usually to the Bay Area.

The Bay Area Connection

European entrepreneurs come to the Bay Area mainly to find venture capital and to scale. They also come to tap into the business and marketing expertise at which the Bay Area excels. Many draw on a deep infrastructure of institutional support provided by their governments and by businesses and business leaders from their home countries that are already embedded in the region. This bridge, composed of overlapping public and private networks, provides startups with short-term landing pads and with expertise, advice, and connections to help them grow their businesses.

For Nordic startups, this support infrastructure is built around three major components: government offices (consulates and national or subnational government agencies); Nordic Innovation House; and regional business organizations. Particularly for government offices, the functions of these entities often overlap. Taken together, the Nordic presence is substantial.

Government Offices, Nordic Innovation House, and Business Organizations

Nordic governments are represented by consulates (Norway, Sweden, Denmark), honorary consulates (Finland and Iceland), business support units (Business Sweden and Finpro), and national technology agencies (Tekes, Vinnova and Innovation Center Denmark). They also collaborate through Nordic Innovation House, which offers a soft-landing space for startups from across the Nordic region—Norway, Sweden, Finland, Iceland, and Denmark—as a cooperative project of all five countries. Initial support for the project came from the region's multinational innovation partnership Nordic Innovation, and is sustained by private companies through membership subscriptions.

The trend among country representatives and cross-nationally between government agencies is toward collaboration, as a collective presence is increasingly seen as being more impactful than more isolated initiatives. This approach is exemplified by Silicon Vikings, a regional association of business leaders hailing from Nordic countries. Headquartered in Silicon Valley, the Silicon Vikings global network includes chapters in Copenhagen, Gothenburg (Sweden), Helsinki, Oslo, Reykjavik and Stockholm. Participation was recently extended to neighboring Baltic countries (Estonia, Latvia and Lithuania), adding Tallinn, Vilnius and Riga to the list of overseas hubs. Other business groups such as the Danish American Chamber of Commerce and the Swedish-American Chamber of Commerce actively include startup-oriented events in their agendas.

Leading Corporations

A number of leading Nordic corporations are present in the Bay Area, with the goal of connecting to and participating in the region's innovation economy. Most often, larger Nordic companies are present in Silicon Valley through what can be termed "innovation outposts," which vary in size from a handful to several hundred staff. Since technology and ideas move rapidly, to fully participate in the region's innovation economy companies need a full-time presence. These offices play multiple roles, monitoring technology trends and developments, reporting back to their home offices, and developing partnerships with universities and with large Bay Area companies. Recognizing that young companies are often more nimble and can out-innovate even companies with large research budgets, these corporate outposts also seek out startups, to identify those with business models or technologies that can support their business plans through partnerships and acquisitions. Major companies with a presence in the region, some with venture arms, include ABB, Nokia, Volvo and Ericsson. Independent venture firms such as Sweden's Creandum have also established a presence.

The Bridge to Silicon Valley

A recent survey by Silicon Vikings identifies 160 Nordic startups operating in the Bay Area, of which 79 responded to the survey or participated in interviews. Of those, half (51 percent) were started in the Nordic region and later opened a US subsidiary or affiliate, and half (49 percent) were started in the US by a Nordic founder. The number of companies with Nordic founders is led by Sweden (37 percent), followed by Norway (17 percent), Denmark (29 percent), and Finland (11 percent), with Estonia (3 percent) and Iceland (3 percent) accounting for the balance. Sweden also leads in the number of companies that started in the Nordics and subsequently started operations in the US (32 percent), followed by Denmark (30 percent), Norway (14 percent), Finland (14 percent), Iceland (4 percent), Estonia (3 percent) and Lithuania (3 percent).

Why They Come

Why Nordic and other European startups come to the Bay Area in such numbers reflects the challenges that they continue to face in Europe, primarily relating to capital and scale. They find the world's largest pool of venture capital and investors who understand startups. They also find unparalleled opportunities to scale in the US and globally.

Some companies come to the Bay Area for another reason: their business models are built on platforms created by Bay Area companies. Many consumer-facing startups work at some point with companies such as Apple, Google, Facebook, or Twitter, which may require a full-time presence to build products collaboratively. This is the case with Swedish music streaming company Spotify, which established a Bay Area office in 2010 in order to be close to the region's tech community and to companies such as Facebook, Twitter and Uber, with which it has strategic partnerships and whose platforms are central to its ability to scale.

How They Grow

Often, startups that gain traction will move their management team and headquarters to the Bay Area, with one or more of the founders relocating. A US-headquartered company will usually maintain an affiliate presence in its home country to handle operations there. In other cases, the European company will keep its headquarters and leadership team at home and create a US affiliate.

In either case, the pattern that most often emerges reflects a division of labor, where different and complementary tasks are performed in the Bay Area and at home. Frequently this stems from the high cost of employing engineers in the Bay Area and the availability and lower cost of engineers of comparable quality in Europe. Bay Area offices usually source investment and lead expansion into US and global markets. Home offices typically provide infrastructure and engineering support. As a result, the employee count at home may be larger, even if the company becomes US-headquartered. Both the Bay Area and the home country gain: the Bay Area through an infusion of companies and talent, and the home country through the increased employment, revenue, and visibility that comes from having a successful global company that is more competitive and has grown faster than it could have had it stayed at home.

Building the Nordic Connection

The Nordic region plays a significant and growing role as an economic partner for the Bay Area. Its presence is marked not only by large technology companies such as Nokia and Ericsson, but by large numbers of startups that come to the region to source funding, to partner, and to scale and grow globally. In the process, some such as Zendesk have become leading global companies. The relationship builds on a foundation of innovative capacity that distinguishes the Nordic countries—Sweden, Denmark, Norway, Finland and Iceland—from other countries relative to their economic size and population. They also share a perspective that aligns with the prevailing Bay Area/Silicon Valley ethos: an orientation toward innovation and entrepreneurship, and an ambition to grow globally. This offers high-value opportunities for the Bay Area and complementary benefits for its Nordic partners.

The Nordic Entrepreneurial Landscape

“Like so many before us, we went West in pursuit of a gold rush—this modern day one fueled by the Internet and a severe case of being bitten by the TechCrunch bug. After so many visits to the West Coast, we were sure San Francisco was the right place: being part of a startup industry, the early adopter fast-mover customers, the investors, the talent (and talent with actual relevant experience), the sheer density of startups and startup people, and of course the sunshine.”¹

—Mikkel Svane, Founder & CEO, Zendesk and author of *Startupland*

The San Francisco Bay Area, which includes Silicon Valley, is widely recognized as the world’s leading center for technology innovation and entrepreneurial activity. Over several decades, it has successfully spawned waves of world-leading companies in information technology, social media, and life sciences and continues to generate companies and business models that create new industries and disrupt existing ones. Its assets in research, sector concentration and risk capital work together to create a global innovation platform, making the Bay Area/Silicon Valley region a magnet for both large and small companies from around the world. In this respect, the Bay Area is a hub that connects to other global knowledge-led regions, inviting companies and countries to access and leverage its resources in order to compete and grow globally.

European companies fill that landscape. As documented in the Economic Institute’s August 2017 report, *Innovation Bridge: Technology, Startups and Europe’s Connection to Silicon Valley*, European governments actively support incubators and accelerators and field technology teams, European corporations support innovation offices and corporate venture arms, and hundreds of startup and early-stage companies are active. Small entrepreneur-led companies, most often technology-based, are generating new products or services that create jobs and revenue and may ultimately disrupt existing companies and industries, or create new ones. In a growing number of cities and countries around the world, startups are seen as critical to the innovation process and to innovation-led growth. This recognition is at the heart of Europe’s technology and startup presence in the Bay Area, and of the initiatives European governments and business organizations have developed to connect their companies to the region.

While numerically that flow and the economic activity it represents is led by Europe’s largest economies (the United Kingdom, Germany and France) the economies of the Nordic region—Sweden, Norway, Finland, Denmark and Iceland—punch far above their weight, with a disproportionately large impact and presence relative to the size of their populations and economies. This report addresses that presence, and how and why the Nordic region has become a significant technology and innovation partner for the Bay Area and a leader in the two-way innovation process.

Innovation Advantage

The Nordic region’s economies consistently place high on global innovation rankings. As illustrated by the following examples, Sweden, Denmark and Finland rank consistently among the top ten, based on performance in categories such as investment in R&D, per capita concentration of researchers, deployment of modern communications technology, infrastructure, and sustainable practices.

Bloomberg 2017 Innovation Index

Nordic rankings (50 country scale): Sweden #2, Finland #5, Denmark #8, Norway #14, Iceland #25

(Measures: R&D intensity, Manufacturing value-added, Productivity, High-tech density, Tertiary efficiency, Researcher concentration, Patent activity)²

Global Innovation Index 2017

(Cornell University, INSEAD, and World Intellectual Property Organization)

Nordic rankings (127 country scale): Sweden #2, Denmark #6, Finland #8, Iceland #13, Norway #19

(Measures: 82 indicators, based on institutions, human capital and research, infrastructure, market sophistication)³

Information Technology and Innovation Foundation

Nordic rankings (56 country scale): Finland #1, Sweden #2, Denmark #6, Norway #13, Iceland #19

(Measures impact on global innovation based on indicators relating to taxes, R&D policy and human capital, subtracting from a nation's score for "mercantilist policies" such as weak intellectual property protection.)⁴

Nordic countries also rank high in digital performance.

Digital Economy and Society Index 2017 (DESI)

Nordic rankings (29 country scale): Denmark #1, Finland #2, Sweden #3

(Measures the digital performance of EU members based on connectivity, human capital, use of the internet, integration of digital technology, and digital public services.)⁵

Underlying this performance is intensive scientific research. The National Science Board reports that Denmark, Finland, Sweden and Iceland each have a top 1 percent share of citations in scientific publications globally, relative to all the country's publications in the same time period and field. Data also indicates that this research intensity is strengthening.⁶ Citations of research articles in other scientific media is an often-used indicator of the quality (as opposed to quantity) of a nation's research output.

While each country has distinctive strengths and assets, the Nordics share several elements in common. These include highly educated societies, with less income inequality than most developed economies; high-quality universities; and strength in science and technology. Sector strengths build on that foundation. Sweden benefits from a product-making background and is the headquarters location of companies such as Ikea, Volvo, Ericsson, and Electrolux. Sweden and Finland both have robust telecommunications sectors. Denmark has developed advanced capacities in renewable energy and biopharmaceuticals. All of the Nordic countries have small populations with correspondingly small domestic markets, which makes thinking globally a necessity. From the outset, many Nordic companies and their governments tend to look outward when it comes to global competition and markets.

Startup Hubs

The startup bridge to the Bay Area begins in cities throughout Europe, but is anchored in a number of major cities that have emerged as key startup and entrepreneurial hubs. Most are capitals or business centers that concentrate talent, based on strong universities, corporate headquarters, sector strength (e.g., financial services), and capital. These places are also where the Bay Area's European startups mostly come from and where future partnerships are most likely to develop.

Stockholm



Photo by Arild Vågen, Wikimedia Commons. License: CC BY-SA 3.0

Stockholm is one of Europe's leading startup centers, joining London, Berlin, Paris and Amsterdam in the top five. Its status builds on corporate headquarters (Ericsson), an educated talent pool, and universities and institutes (such as the Karolinska Institute, KTH Royal Institute of Technology, and Stockholm University) that work closely with industry. In 2015, the Swedish government established the National Innovation Council to advance Sweden as a country of innovation; members include the Prime Minister as Chair, five government ministers, and leaders from the business and research sectors. Government investment in R&D is high on a global scale, with Greater Stockholm accounting for one-third of Sweden's R&D expenditures.⁷

Startups in the city have attracted USD 2.5 billion in venture investment since 2005, led by five industries that account for almost three quarters of venture funding: software (36 percent), financial services (13 percent), pharmaceuticals and biotechnology

(12 percent), communications and networking (6 percent) and semiconductors (6 percent). Seventy-five percent of that funding comes from outside Sweden, suggesting the attractiveness of Sweden's innovation system to outside investors.⁸

The scale of Stockholm's startup scene is growing: in 2016, over USD 1.4 billion was invested in Stockholm-based tech companies, a USD 500 million increase over the year before and a sevenfold increase in just four years. In the same year, there were 49 tech exits, valued at USD 1.75 billion, accounting for more than half of the exit value in the Nordic region. On a per capita basis, Stockholm has the second highest number of unicorns (startups valued at USD 1 billion or more) in the world, after Silicon Valley. Reflecting this growth, 18 percent of the city's workforce is connected to tech, the highest share of any city in Europe (across Europe the share is 10 percent). As an enabler of tech activity, and perhaps reflecting it, Sweden has the highest penetration of smart devices in Europe—1.5 for every person—and Stockholm was the first city in the world to introduce 2G, 3G, 4G and soon 5G.⁹

Swedish startups tend to look to global markets immediately. For example, nearly 80 percent of companies participating in Stockholm's SUP46 accelerator have expanded to international markets. Reflecting the openness of the city's startup environment, SUP46 members include 45 nationalities.¹⁰

As a startup center, Stockholm also ranks high on a global scale. The *Global Startup Ecosystem Report 2017*, produced by the Startup Genome project, ranks five European cities in the top twenty globally: London (#3), Berlin (#7), Paris (#11), Stockholm (#14), and Amsterdam (#19). Silicon Valley is ranked #1.¹¹

Helsinki



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Following a similar pattern, Helsinki places number four among the 60 cities ranked on the European Digital City Index 2016.¹² It particularly benefits from Nokia's legacy as a global telecommunications company, which has contributed to the development of a strong engineering community. At least 300 startups have been founded by former Nokia employees.¹³

Helsinki also supports a robust startup infrastructure. Aalto Entrepreneurship Society (Aaltoes), Finland's largest student startup community, organizes nearly 100 events every year.¹⁴ Finland's first Slush conference was organized in 2008 and since then has become the Nordic region's leading startup event. It has also developed a significant Eurasian footprint, with events and communities in Tokyo, Shanghai and Singapore. Helsinki hosts a number of significant accelerators with both business and government support. Located adjacent to Aalto University, Startup Sauna—an accelerator supported by the government, businesses and academia—is particularly noteworthy. It provides co-working space, mentors, networking, and trips to Silicon Valley, and to date it has supported 208 startups in 14 cohorts, which together have attracted \$110 million in funding.¹⁵

Angel investors are active through the Finnish Business Angels Network (FIBAN), which links 500 investor members and is among Europe's largest organizations of its type. In 2016, business angels invested EUR 53 million in 324 startups, representing 43 percent growth

from the previous year. Overall, over 400 startups in Finland attracted EUR 383 million in investment, also a record. As an indication of the competitiveness of Finland's startup environment, foreign investors were the largest single source of funds, followed by Finnish angels and Finnish venture firms.¹⁶ Recently, Finland has experienced a strong influx of investment from China, represented most notably by Supercell's acquisition at a USD 10 billion valuation by Internet giant Tencent. High-profile success stories include gaming company Rovio Entertainment, the producer of Angry Birds, and Supercell, which developed Clash of Clans. Finland is also the birthplace of Linux, MySQL and IRC, so for a nation of 5 million punched far above its weight in open source technology.

Finland's government invests 3.2 percent of GDP in R&D, a high figure by OECD standards, and actively supports startup and technology development through its technology and innovation agency Tekes.¹⁷ Finnvera, the government's venture fund, directs investment to early stage companies.

Copenhagen



Photo by Pudelek, Wikimedia Commons. License: CC BY-SA 4.0

Denmark's relatively young startup ecosystem is growing. The change is significant, since until now Denmark's welfare state hasn't provided strong incentives for entrepreneurs to take on risk. The Danish government has made support for startups a priority, creating in 2017 a Disruption Council, composed of business, labor, academic, community, and innovation leaders, to devise innovative solutions to emerging national challenges. Its program includes a director

for startups. Other initiatives include entrepreneur-oriented investment programs such as the early-stage Danish Growth Fund and the later-stage Danish Innovation Fund. The Ministry of Business & Growth and the Ministry of Immigration & Housing support Startup Denmark, a visa program designed to attract entrepreneurs from other countries.

While the largest number of startups focus on software,¹⁸ the life sciences sector is emerging as a focus, with new government strategies announced and increased investment by leading bio-pharma companies such as Novo Nordisk. While there's not a long track record, there is an initial accumulation of successes, such as customer service platform Zendesk (now based in San Francisco), employee engagement company Peakon, consumer review platform Trustpilot, and online takeaway service Just Eat, which went public in London in 2014. Skype co-founder Janus Friis is Danish. While Copenhagen's small tech ecosystem still falls short in experienced mentors, the number of serial entrepreneurs is growing. Startup hubs such as Startup Village and co-working spaces Rocket Labs and Founders House are also expanding. Bay Area organizations are getting in the act. In 2017, Silicon Valley's Singularity University opened its second overseas campus in Copenhagen, offering educational programs focused on exponential technological change for large enterprises and startups. The city's startup community is promoted by a non-profit organization #CPHFTW ("Copenhagen for the Win"). Website Nordic Web tracks startup activity.¹⁹

Oslo



Photo by Bjørn Erik Pedersen, Wikimedia Commons.
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Startup infrastructure in Oslo and other Norwegian cities such as Trondheim and Tromsø includes Innovation Norway, The Research Council of Norway, Startup Norway, ICT Norway, Simula Research Laboratory, Siva Incubators, co-working spaces such as MESH, Connect Norway, Nordic Innovation, and the Norwegian Venture Capital & Private Equity Association. A growing number of events also support the startup community, including Nordic Startup Awards, Startup Weekend, Emax Norge, the Norwegian Venture Capital Conference, and Oslo Innovation Week. Eight seed capital and 15 venture capital firms provide funding, and the country has seen a number of notable exits across multiple sectors, including Cisco's acquisition of video conference company Tandberg for more than USD 3 billion in 2010 and Bayer's USD 2.9 billion deal to acquire cancer drug maker Algeta in 2014.²⁰ As part of the nascent trend of Bay Area accelerators expanding their presence overseas, The Vault, a Bay Area co-working space that delivers acceleration services, will soon open its first overseas facility in Oslo.

Reykjavik



Photo by Yelkrokoyade, Wikimedia Commons. License: CC BY-SA-3.0

In Iceland, Startup Iceland is playing a catalytic role. Founded in 2010 in the wake of Iceland's financial crisis (which stimulated a focus on entrepreneurship as a pathway to recovery), it hosts an annual conference for entrepreneurs that includes high-profile foreign speakers. Other resources for startups in the nation of 320,000 include three accelerators and four venture capital funds. Its small but growing startup community is attracting outside attention and its successful startups list includes companies such as CLARA, which was acquired by Silicon Valley's Jive Software in 2013, and Modio, which was acquired by Autodesk in 2015.²¹

From Startup to Scaleup

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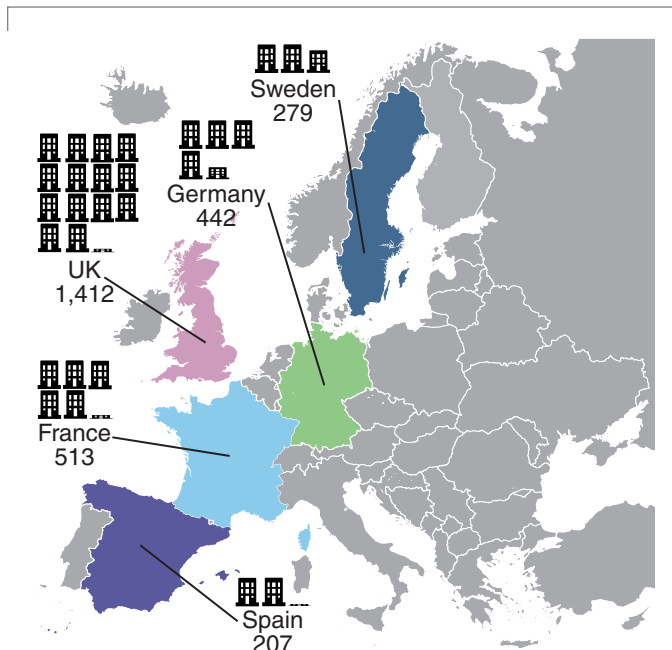
Some of those companies have become global players, including Supercell, Spotify, King.com, Klarna, iZettle and Zendesk—each having secured over USD 100 million through venture investment or IPOs. Other noteworthy Nordic startups include Rovio and Symphogen. Gaming is

a particularly strong sector, but a growing number of companies can also be found in software, digital media, fintech, and hardware. Twenty Nordic scaleups have moved their headquarters abroad, primarily (75 percent) to the US, with the balance locating in leading European centers such as London and Berlin; most continue to maintain significant operations in their home countries.²³

The lion's share of this activity is occurring in the major cities: Stockholm (with USD 3 billion raised by 90 scaleups), followed by Copenhagen (USD 1 billion raised by 70 scaleups), Helsinki (USD .8 billion raised by 83 scaleups), Oslo (USD .4 billion raised by 33 scaleups), and Reykjavik (USD .1 billion raised by 13 scaleups).²⁴

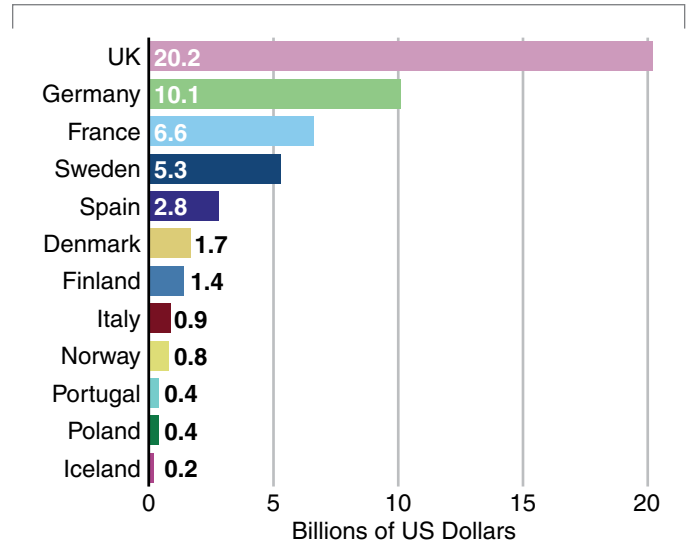
In another 2016 SEP analysis of 3,444 European ICT scaleups (startups able to raise over USD 1 million) in 12 countries (Denmark, Finland, France, Germany, Iceland, Italy, Norway, Poland, Portugal, Spain, Sweden, and the UK), the UK had the largest number (1,412), followed in the top 5 lineup by France (513), Germany (442), Sweden (279), and Spain (207).²⁵ Many of these companies have become global. The Nordic region concentrates a number of companies (called "scalars" in the SEP definition) that have succeeded in attracting over \$100 million in investment.

Scaleups in Europe, 2016: Top Five Countries



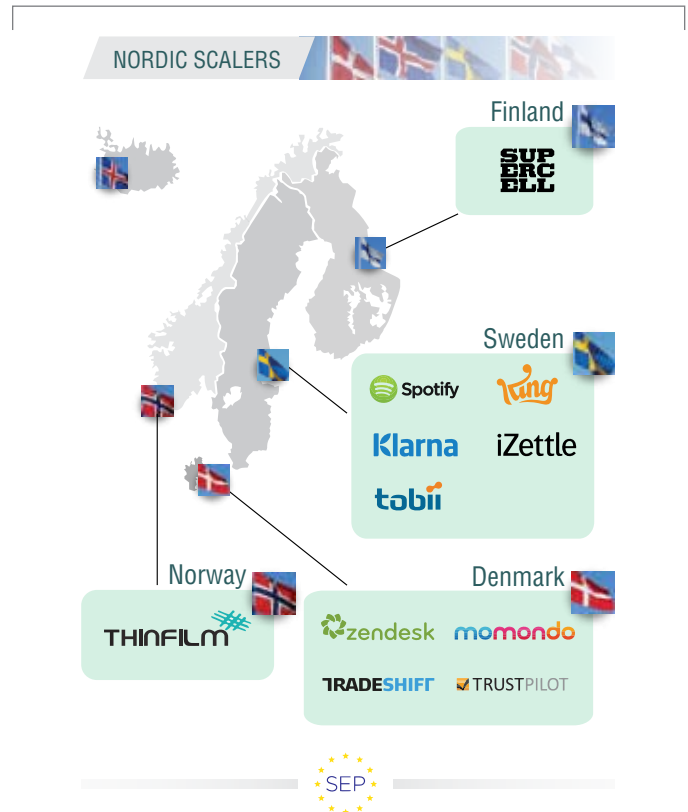
Data Source: SEP Monitor, June 2017
Analysis: Bay Area Council Economic Institute

3,444 scaleups in 12 countries raised capital (VC + IPO) totaling USD 50.8 billion



Data Source: SEP Monitor, June 2017
Analysis: Bay Area Council Economic Institute

Nordic Companies That Have Secured Over USD 100 Million in Capital (from VC funds or via IPO)

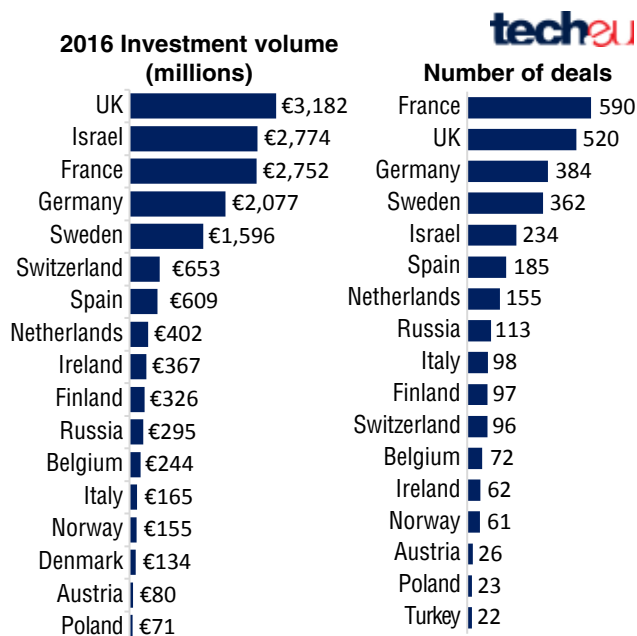


Source: SEP Monitor, June 2016

Sweden in particular sits prominently on Europe's investment map. In 2016 the UK, France, Germany and Sweden led Europe in both the number of deals and investment volume, with the greatest jumps in funding from 2015 being registered in France and Sweden.²⁶

In 2016, Sweden saw a record number of investment rounds and capital raised—twice the number in 2015. This was primarily due to a record level of seed investment, enabled by a doubling of the number of investors—primarily new angels. Fintech was the most popular sector for investors across the board, with strong growth also registered in e-commerce, digital health and gaming. Most rounds ranged from less than USD 1 million to USD 5 million, with a handful valued at USD 5 million to USD 25 million or more. Foreign investors (led by US and UK investors) were active, focusing mostly on growth rounds. Consistent with investment patterns across Europe, most investments were small compared to those in the US. Notwithstanding the foreign investor focus on it, growth stage funding remained flat, again reflecting the challenge in most of Europe of securing larger scale funding.²⁷

Tech Funding Rounds by Volume and Country, 2016



Source: Tech.eu, European Tech Funding Report 2016

Sector Strengths

The Nordic region's economies stand out as early adopters of cloud computing, enhancing their innovative capacity and digital competitiveness. Finland, with strong IT, telecommunications, and mobile gaming sectors, has Europe's highest rate of cloud adoption; by one estimate, half of Finland's economic activity will be digital by 2025. Sweden and Denmark join Finland on the short list of Europe's top adopters.²⁸

Sweden ranks high on the list countries with of billion dollar+ European software companies, with Denmark and Finland also placing strongly relative to the size of their economies.²⁹

Sectors where the Nordic region shows strength across the board include e-commerce, software, fintech (payments), life sciences, and entertainment in Sweden; gaming (computer and mobile), e-commerce, software, and health in Finland; software, bio-pharma, and renewable energy in Denmark; biotech, software, and IoT in Norway; and games and virtual reality in Iceland.

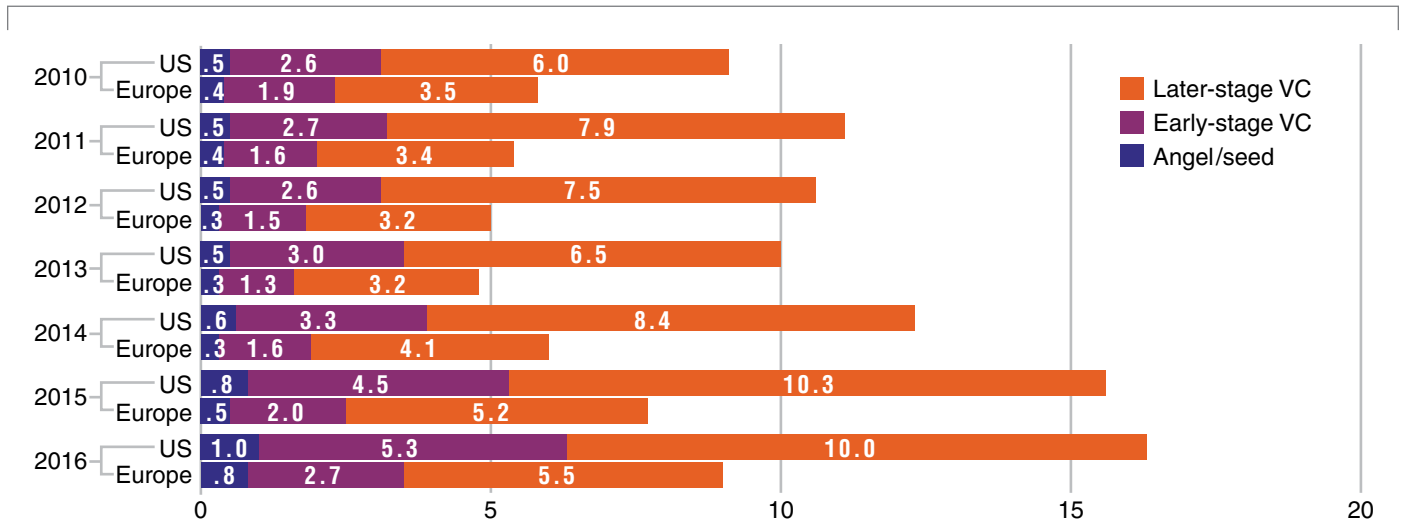
Slush



Photo by Petri Anttila, Slush Media, Used with Permission

The growing energy of the Nordic startup scene can be seen in the Slush conference held each winter in Helsinki. The 2016 conference attracted 343,000 visitors and 17,500 participants, two-thirds of them from Nordic countries. That included 2,336 startups and 1,146 investors. Slush organizers chartered an aircraft to fly participants directly from the Bay Area.³⁰

Venture Funding Median Deal Size by Stage, US and Europe, 2010–2016, Millions of US Dollars



Source: Venture Pulse, Q4'16, Global Analysis of Venture Funding, KPMG Enterprise. Data provided by Pitchbook, January 12, 2017
Analysis: Bay Area Council Economic Institute

Systemic Challenges

As in much of Europe, Nordic startups face two major systemic challenges: access to capital and market scale. Both draw them to the Bay Area. Though a lesser issue, taxation is also a concern.

Funding

While the Nordic region enjoys active angel investor communities and ample seed funding, Series A funding is hard to find, and Series B or C (growth funding) is even more difficult to secure. Most venture firms and the levels of funding they can provide are small. This is consistent with the European venture market as a whole which, while growing, lacks the scale and experience of venture firms in the Bay Area.

Market Scale

Even large European economies such as France or Germany lack the scale of the US market. This is a particularly large issue for the smaller economies of the Nordic region. For startups whose highest ambition is to lead in their home markets, there's no problem; but for companies that want to become global players, this is a challenge. It is particularly the case for IT companies, where the scale of the US market greatly exceeds that of all European markets combined. As a result, once startups have consolidated a base in their home markets and want to grow, many leapfrog Europe and come to the United States—usually to the Bay Area.

Taxation

Although they are not an issue of the same magnitude, tax and regulatory regimes can be a challenge for successful entrepreneurs. While, on the whole, corporate taxes aren't a big factor (since most startups don't make money), personal income tax—which is high—can be a more significant issue for founders. This is particularly the case when selling a company. In Denmark, for example, the top marginal capital gains tax rate is 42 percent, compared to an average 28.6 percent (combined federal, state, and local on long-term capital gains) in the US;³¹ the top marginal personal income tax rate (plus payroll taxes) is 60.4 percent, compared to 46.3 percent in the US.³² Denmark's social welfare policies also comes into play through the employment system, which incentivizes traditional employment over entrepreneurship: for example, an employee who loses his or her job is compensated by the government at approximately the same income as before, while people leaving entrepreneurial enterprises lack the same benefit (incentivizing the safer option). In some countries, tax policy also makes it difficult for companies to use stock options as incentives in employee compensation. In Sweden, for example, stock options are considered the same as income from employment and are taxed at rates as high as 67 percent.³³

The Bay Area Connection

“Silicon Valley is a deeply connected place at the human level. Who you know matters. Beyond their advice for what to do and not to do, mentors are incredibly important because of their ability to provide connectivity into the human networks. If you look across Europe, they fundamentally don’t exist in quality anywhere outside London and Berlin. Most programs draw on people who have been successful in a large company but weren’t entrepreneurs, so bring big company answers to companies that aren’t even companies yet. So it’s not the same thing as here, where people with that experience are everywhere. You don’t have this density of ‘been there, done that’ anywhere else in the world.”

—Chris Burry, Co-Founder, USMAC

As suggested above, European entrepreneurs come to the Bay Area mainly to find venture capital and to scale in the US and global markets. They also come to tap into marketing expertise at which the Bay Area excels. When they do this, many draw on a deep infrastructure of institutional support provided by their governments and by businesses and business leaders from their home countries that are already embedded in the region. This bridge, composed of overlapping public and private networks, provides startups with short-term landing pads and with expertise, advice, and connections that can help them grow their businesses. Whether that happens at a global scale, in the US or at home, most absorb the Silicon Valley experience, applying its values and insights to their future business strategies.

For Nordic startups, this infrastructure is built around three major components: government offices (consulates and national or subnational government agencies); Nordic Innovation House; and regional business organizations. Particularly in the case of government offices, the functions of these entities frequently overlap. Taken together, the Nordic presence is substantial.

Government Offices

Nordic governments are represented by both consulates and national technology and business support agencies. The technology agencies play a particularly important role in supporting startups.

Tekes, Finland’s funding agency for innovation, finances approximately 1,500 business research and development projects, and almost 600 public

research projects at universities, research institutes and universities of applied science.³⁴ As part of the Team Finland network, which connects Finland’s honorary consulate, Tekes, and the investment promotion agency Finpro, Tekes’ Bay Area office networks Finnish startups in the region and provides advice, support and early stage funding. In 2016, Tekes engaged locally with approximately 200 Finnish startups visiting or residing in Silicon Valley, including residents at Y Combinator and other leading accelerators.

Vinnova is the Swedish governmental innovation agency, Sweden’s main public financier of innovation projects. In addition to financing research and innovation projects, Vinnova also supports and organizes networks, meetings and analyses, with an annual grants budget of approximately USD 350,000. The Vinnova Silicon Valley Office has been in operation since 2012 and is part of Team Sweden in the Bay Area, together with Business Sweden and the Swedish Consulate. It has two main objectives: to detect and understand trends in technology, entrepreneurship and business and their policy implications for Sweden; and to facilitate access to world class expertise, knowledge and networks for Swedish actors—in particular for startups—as a complement to domestic resources. Nordic Innovation House, of which Vinnova is the Swedish partner, is the main platform for delivering these services. The team consists of 4–5 people, of which 3–4 are Vinnova-Wallenberg Fellows, thanks to support from the Wallenberg Foundation. The selection criteria for these individuals emphasizes the potential systemic impact they will have as they return to Sweden after 6–10 months in Silicon Valley.

Innovation Center Denmark, which since 2006 has served as a technology and startup connector between Denmark and the Bay Area, has since been joined by six other Danish innovation centers around the world as a network linking academia and research with both established and startup companies. In Silicon Valley, the Innovation Center Denmark 27-person team has developed two distinctive programs: SCALEit for startups, and XPLOREit for larger companies. These efforts were capped in the summer of 2017, when the Center was also designated as a Consulate General, strengthening Denmark's presence in the region. Connected to that initiative, the new consulate will also serve as home to Denmark's newly-created global Tech Ambassador.³⁵

Nordic Consulates and Government Agencies in the Bay Area

CONSULATES

- Denmark
- Norway
- Sweden
- Finland (honorary)
- Iceland (honorary)

NATIONAL BUSINESS AND TECHNOLOGY AGENCIES

- Business Sweden (Sweden)
- Finpro (Finland)
- Tekes (Finland)
- Vinnova (Sweden)
- Innovation Center Denmark
- Innovation Norway

Nordic Innovation House

Palo Alto-based Nordic Innovation House is an outgrowth of a Norwegian initiative, Innovation House, which was first established to support startups from Norway. Today it offers a soft-landing space for startups from across the Nordic region—Norway, Sweden, Finland, Iceland, and Denmark—as a cooperative project of all five countries. Initial support came from the region's multinational innovation partnership Nordic Innovation, and is sustained by private companies through membership subscriptions. In addition, the Nordic governmental innovation agencies Innovation Norway, Vinnova (from Sweden), and Team Finland are located at Nordic Innovation House and available to help developing companies.

Approximately 40 percent of Nordic Innovation House residents are at the validation (early) stage, while half already have products, customers, and some investment and are looking for partners or a market fit. Ten percent of the Nordic Innovation House partners are Nordic VCs and larger corporations that send management teams to Silicon Valley for programs built around knowledge creation and network building. Approximately 170 companies are housed in the center's co-working space, 30 participate in its accelerator programs, and 20 in a separate health technology pilot. The largest number of residents and partners comes from Norway (40 percent), followed by Sweden (35 percent), Finland (15 percent), and then Iceland and Denmark. Danish companies are more often supported by Innovation Center Denmark, which has a separate location in the area to accommodate a bigger team.

Nordic Business Organizations Supporting Startups in the Bay Area

- Danish American Chamber of Commerce of Northern California (Denmark)
- Silicon Vikings (Nordic region)
- Swedish-American Chamber of Commerce of San Francisco & Silicon Valley (Sweden)

Business Organizations

The trend toward Nordic collaboration—smaller economies pooling their efforts to create greater critical mass—can also be seen in Silicon Vikings, a regional association of business leaders hailing from Nordic countries. Headquartered in Silicon Valley, its global network reaches approximately 40,000 business and other leaders, and includes chapters in Copenhagen, Gothenburg (Sweden), Helsinki, Oslo, Reykjavik and Stockholm. Participation was recently extended to neighboring Baltic countries (Estonia, Latvia and Lithuania), adding Tallinn, Vilnius and Riga to the list of overseas hubs. Programs include Nordic Pitch Nights, business forums and professional networking events, and an annual Nordic Tech in the Bay program.

Other business groups, such as the Swedish-American Chamber of Commerce (SACC), actively include in their agendas startup-oriented events such as the Silicon Valley Meets Silicon Alley forum, co-sponsored by SACC New York and SACC San Francisco/Silicon Valley and held at the Chamber of Commerce in Stockholm in October 2016.

Nordic Corporations Supporting Startups in the Bay Area

CORPORATE RESEARCH LABORATORIES AND INNOVATION OFFICES

- ABB Silicon Valley Campus (Sweden)
- Ericsson Silicon Valley (Sweden)
- Nokia Networks (Finland)
- Seco Tools (Sweden)
- Volvo Cars Silicon Valley R&D Tech Center (Sweden)

CORPORATE VENTURE ARMS

- ABB Technology Ventures (Sweden)
- Ericsson Ventures (Sweden)
- Nokia Growth Partners (Finland)
- Novo Ventures (US) Inc. (Denmark)
- Volvo Group Venture Capital (Sweden)

Leading Corporations

A number of leading Nordic corporations are present in the Bay Area, with the goal of connecting to the region's innovation economy. Sometimes this is through research laboratories, such as Ericsson Research Silicon Valley, a strategically located Santa Clara campus which enables the company to meet new partners and reach out to startups with potentially game-changing ideas.³⁶ A different example can be seen in Thinfilm Electronics, a Norwegian producer of thin, flexible sheets of mixed-silicon materials that can be used for sensors, with particular application to Internet of Things connected devices (machine-to-machine communication). Thinfilm, founded in 2005, has its US headquarters in San Jose, and now occupies a 93,000 square foot production facility, including a 22,000 square foot clean room acquired from Qualcomm. According to COO Peter Fischer, "I was looking for alternatives here in the area since you find the wide skill set of people in Silicon Valley. It's not only the high-tech manufacturing of silicon, it's also about software." The company currently has 144 employees globally, most of whom (114) are in San Jose.³⁷

Most often, larger Nordic companies are present in Silicon Valley through what can be termed "innovation outposts," which vary in size from a handful to several hundred staff. Since technology and ideas move rapidly, to fully participate in the region's innovation economy, companies need a full-time presence. These offices play multiple roles, monitoring technology trends and developments, reporting back to their home offices, and developing partnerships with universities and with large Bay Area companies. Recognizing that young companies are often more nimble and can out-innovate even companies with large research budgets, many of these corporate outposts are also seeking out startups, to identify those with business models or technologies that can support their business plans through partnerships or acquisition. In any year, a single corporate office may screen as many as several hundred startups, looking for partners they can support or potentially acquire. They also look to learn what startups are working on, to understand what disruptive technologies or business models might be on the horizon.

SPOTLIGHT

Ericsson

Sweden's Ericsson, one of the world's largest providers of telecommunications equipment, has a major presence in Silicon Valley, with more than 500 employees in Santa Clara focused on virtual reality (VR), augmented reality (AR), and mobility. With a successful 140-year history as an infrastructure company, Ericsson aims to accelerate its digital transformation and sees its presence in the Valley as helping the company position itself for the industry's expected shift to ubiquitous mobility. With these goals, its innovation unit, Ericsson Business Innovation, aims to create new, higher-margin revenue streams by harnessing ideas both within and outside the company. This involves three main areas of focus: internal incubation (identifying and supporting innovative ideas inside the company); investment in technologies that support its core business or potentially generate new ones (through its venture arm); and engagement with external startups that can help meet the same goals. Ericsson Ventures, the company's VC arm, invests globally in startups in technology areas including networking and media, but has a particular focus on the Bay Area. Like Ericsson Business Innovation, it focuses on three core areas: technologies that support or expand its core business lines (primarily networking), particularly those with disruptive potential; companies that address fields adjacent to the core business (e.g., in non-telco markets); and companies that are very early-stage but have the potential to drive connectivity at scale (e.g., autonomous driving or AR/VR). In the last six years, Ericsson Ventures has deployed around USD 100 million, across roughly 25 startups in Silicon Valley and globally.

Venture Firms

On a smaller scale, independent European venture firms such as Sweden's Creandum have also established a presence. Founded in Stockholm in 2003, Creandum initially focused on the semiconductor industry and only in Sweden. Finding it hard to scale,

the firm diversified in its second fund, expanding from seed to Series A, and focusing more on software. Spotify was an early investment. Creandum also expanded its geographic focus to the larger Nordic region. With the firm's third fund, it started to look beyond the Nordics, with a few investments in the UK and Germany. Its San Francisco office was opened at the same time. With the launch of its fourth fund of USD 200 million in 2016, Creandum's focus expanded again, as the firm opened an office in Berlin. Today, with USD 500 million under management, the company still focuses heavily on the Nordic region but invests in companies across the whole of Europe.

As described by Creandum principal Carl Fritjofsson, the role of its San Francisco office is to make the firm a smarter investor in Europe by better understanding trends in the US investor community. It also helps European companies come to the US by providing local support and assistance, principally but not exclusively to its portfolio companies that are ready to expand. A third role is to identify companies to invest in, primarily European startups coming to the Bay Area through incubators, accelerators, and startup events. The Bay Area is an important destination: "In the past, you started in a Nordic country, then expanded to the neighboring countries, and then to the UK or Germany. But it's almost as much work to go to another Nordic country as to the US, so many are taking a shortcut and coming here directly. The perception is if you can crack the US market, you can crack the world."

Nordic entrepreneurs are a focus of Bay Area venture firms as well. San Francisco based Nexit Ventures, whose General Partner Michel Wendell also serves as Honorary Consul of Finland, invests in early- and later-stage high-tech companies, with a principal focus on mobile and wireless and on bringing Nordic mobile companies and innovation to the US. From its West Coast base, it also works to bridge Nordic companies to opportunities in Asia. Established for 20 years and with offices in San Francisco and Helsinki, Nexit has USD 150 million under management, of which approximately 50 percent is invested in Nordic startups and 50 percent in other companies on the West Coast.

The Bridge to Silicon Valley

Why They Come

Why Nordic and other European startups come to the Bay Area in such numbers reflects the challenges that they continue to face in Europe, primarily relating to capital and scale. Europe has fewer venture capital firms—perhaps only twenty with significant scale. European venture capital firms also have less capital to deploy. While seed funding is plentiful, when European startups grow to the point where they need Series A or particularly Series B or C funding, many come to the Bay Area. While some Bay Area venture capital firms do small fundings outside the US, when they are leading an investment round or are participating in a large investment, most want the companies they invest in to be close, where a relationship can be developed with their leadership. This also serves to draw startups to the region.

Companies in more advanced stages of development come if they are planning to go public, since more IPOs happen in the US, and US valuations are higher than those in Europe. They may also come if their exit strategy is to be acquired, since Bay Area technology companies (unlike most European companies) typically grow through acquisition. The average US venture capital exit is nearly USD 200 million, compared to USD 70 million in Europe. From 2012–2016, the count of USD 250 million exits totaled 22 across Europe, compared to 166 in the US.³⁸

Startups coming to the Bay Area also find unparalleled opportunities to scale. While a startup in Norway, for example, can stay and grow at home if its ambition is to lead in the Norwegian market, startups with the ambition to become global companies need a larger playing field. The continued fragmentation of Europe's capital and services markets, heightened by cultural differences and overlapping regulations, leads many startups who have established themselves at home to look to the US as their next growth market. For both companies and their investors, success in the US market is the ultimate test and goal. From this perspective, the Bay Area offers a platform to scale in the United States; because of the presence of Asian and other international companies and governments in the region, it also provides a platform to scale globally.

Some companies come to the Bay Area for another reason: their business models are built on platforms created by Bay Area companies. Many consumer-facing startups work at some point with companies such as Apple, Google, Facebook, Twitter or Amazon, which are based in the Bay Area or elsewhere on the West Coast. Often a full-time presence is required to build products collaboratively. This is the case with Swedish music streaming company Spotify, which established a Bay Area office in 2010 in order to be close to the region's tech community and to companies such as Facebook, Twitter and Uber, with which it has strategic partnerships and whose platforms are central to its ability to scale. It also sees partnering opportunities with newer companies (for example, in health and fitness). As San Francisco Site Lead Kristian Lindwall notes, "Everyone is here." Spotify remains headquartered in Stockholm, while its San Francisco team focuses on marketing, partnership development, and related engineering.

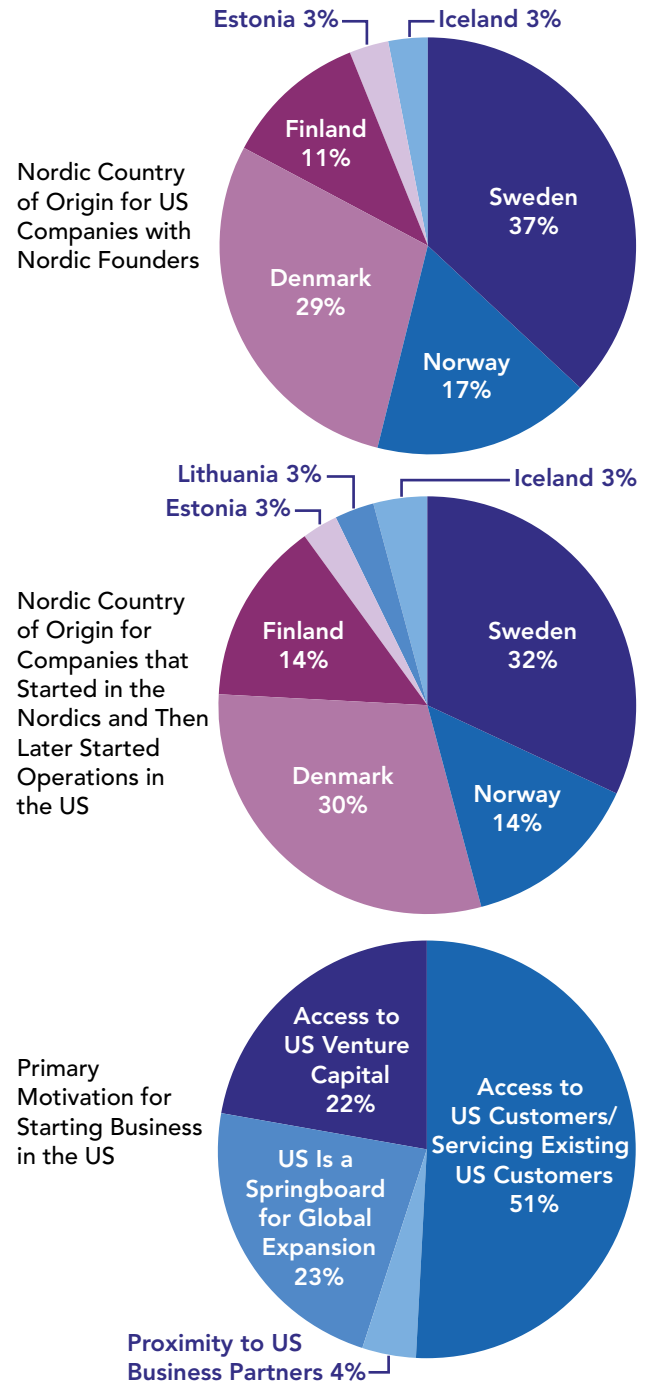
The Bay Area is seen as a welcoming environment for startups, with an open business culture that provides comparatively easy access to senior executives, partners, and mentors, as well as information. Access is enabled by networks that exist at many levels. As expressed by one successful Swedish entrepreneur, "While the mentorship opportunities in recent startup hubs like Berlin and Stockholm have increased dramatically in recent years, the mentors in Silicon Valley are still some of the most experienced and clueful in the world (let's call that factor "X"). In addition, they're also the most willing to invest their time and share their experiences (factor "Y"). When you multiply X and Y, you get a mentorship culture that's light-years ahead of anyone else in the world, and I don't think anyone will catch up for several decades."³⁹

Nordic Startups in the Bay Area

A recent survey by Silicon Vikings identifies 160 Nordic startups operating in the Bay Area, of which 79 responded to the survey or participated in interviews. Of those, half (51 percent) were started in the Nordics and later opened a US subsidiary or affiliate, and half (49 percent) were started in the US by a Nordic founder. The number of companies with Nordic founders is led by Sweden (37 percent), followed by Norway (17 percent), Denmark (29 percent), and Finland (11 percent), with Estonia (3 percent) and Iceland (3 percent) accounting for the balance. Sweden also leads in the number of companies that started in the Nordics and subsequently started operations in the US (32 percent), followed by Denmark (30 percent), Norway (14 percent), Finland (14 percent), Iceland (4 percent), Estonia (3 percent) and Lithuania (3 percent).

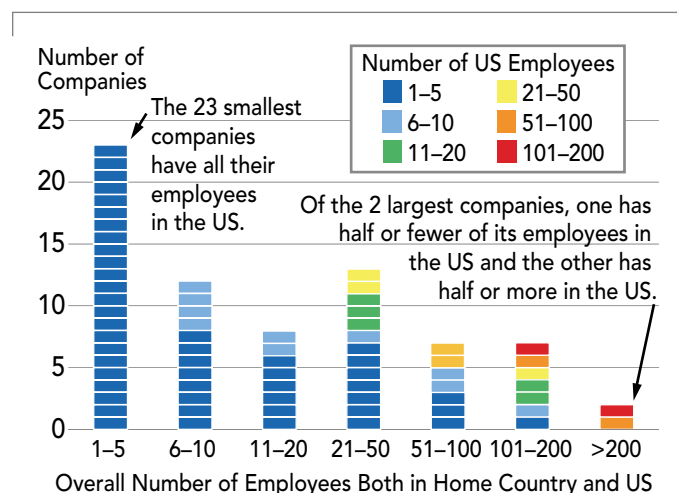
The leading reasons given for starting a business in the US are access to US customers or servicing existing US customers (51 percent), using the US as a springboard for global expansion (23 percent), accessing venture capital (22 percent), and proximity to US business partners (4 percent). Most of these companies are small, the largest number having 1-20 employees across all locations, while others have substantially more (20 to more than 200 employees). Fifty-three percent have received some form of venture investment, with 61 percent of those having received venture investment from the US. Nearly half (45 percent) are already global, having expanded beyond the US and Nordic markets.⁴⁰

Nordic Roots Survey Results: Which Countries are Nordic Startups in the Bay Area Coming From and Why?



Data Source: Silicon Vikings survey results

Nordic Roots Survey Results: Do Nordic Startups in the Bay Area Base Most of Their Employees in the US?



Data Source: Silicon Vikings survey results

Note: Each block in any column represents one surveyed company that has the total number of employees labeled at the column's base. The color of each block represents the number of that company's employees who are based in the US.

According to Finpro, a Finnish public partnership that operates programs to support international growth of Finnish companies, there are 66 Finnish companies in the Bay Area as of May 2017, up from only 12 in 2010. That total includes 19 midsize-to-large companies, 42 startups (most of them ICT companies), 4 other companies/organizations, and 1 US company founded by Finns having operations in Finland. There are also 11+ US tech startups founded by Finns located in the Bay Area (including acquired companies, but excluding startups from Finland). Between 2004 and the present, there have been more than 34 exits of Finnish companies in the Bay Area.⁴¹

What They Find

Some Nordic startups coming to the Bay Area find their way here independently, while others benefit from the extensive government and private support networks outlined above. Those networks play a significant role through training, networking events, and introductions to mentors, funders and potential business partners. Arriving entrepreneurs also find an energized community of fellow founders and partners from around the world with a deep and diverse base of the skills that can enable global scaling.

“...you can build a world-changing organization anywhere, but the job is always easier at your industry's center of gravity. For fashion it's Paris; for finance it's London; for tech it's Silicon Valley. Think about it as running uphill versus running downhill. You expend the same amount of energy in both cases, but if you're running downhill you go so much farther. Being in the center of gravity for our respective industry is much the same: The energy you spend growing your business gets you closer to success than the same energy spent in a different location. So, should you move your non-U.S. tech startup to Silicon Valley? Every situation is unique, but on balance, I've learned that the Silicon Valley advantage pays off nine times out of 10.”⁴²

—Emil Eifrem, Founder & CEO, Neo4j

Arriving startups also find a deep pool of potential investors who, compared to many investors in Europe, are highly accessible to startups. What matters most isn't where you come from, but the value of your ideas. As Torsten Kolind of YouNoodle, a company that connects startups with grants and corporate partners, puts it “Here the founders and investors have an easier time coming together to say ‘we can do this.’ There's more a leap of faith here. A startup and investor will meet each other earlier, and build a company together. Investors in Europe see themselves more as bankers than entrepreneurs.”

Entrepreneurs also need to think carefully, however, about why they want to come. It may or may not be a sufficient justification to experience and learn from the startup scene. A stronger justification, applicable in particular to companies that are ready to scale, is the need to be close to customers (for example, where the company has an e-commerce application that rides on a Facebook platform) and to competitors.

With all its assets, the Bay Area also presents entrepreneurs with significant challenges. Some arrive believing the streets are paved in gold and that investment is easy to obtain, which is definitely not the case. As one investor put it, “It’s like the Olympics here—you have to be able to play at that level. If you’re regional or national, unless you believe in yourself and think your product is top notch and ahead of the pack, you need to limit expectations.” Startups planning to stay long term would do well to arrive with some level of funding already in hand.

A more immediate problem, shared with all Bay Area residents, is housing, which is expensive and hard to find. Rental rates are among the highest in the country, and securing housing in any form can be time-consuming. Another challenge is competition. Even though the region has the world’s largest, most skilled, and most diverse pool of technical talent, competition for engineers is intense. Startups must compete for talent with Facebook, Google, LinkedIn and a host of technology companies that offer attractive salaries and benefits. Engineers tend to change jobs frequently, seeking the best opportunities, so retaining talent can be difficult for an unknown company from another country. For that reason, and with large pools of lower-cost but highly qualified engineers at home, most European and Nordic startups continue to rely on engineering talent in their home countries.

SPOTLIGHT

Arundo Analytics (Norway)

Arundo develops software designed to improve maintenance scheduling and increase asset efficiency for companies with major capital equipment. Its founder, Tor Jakob Ramsøy, ran the digital practice at McKinsey’s Oslo office (which had oil and gas industry customers) and saw interesting things happening with artificial intelligence and machine learning in Silicon Valley. He asked how these concepts could be applied to oil and gas as well as maritime, both leading sectors in Norway. In 2015, the company was launched in Palo Alto and Oslo, with an additional office in Houston after a short while. Today, Arundo’s customers—companies that are looking for data science with large industrial applications (e.g., machine learning and industrial sensors)—are concentrated in the oil and gas and maritime sectors along with the utility sector.

Arundo’s CEO sits in Oslo, but there is no corporate headquarters. Its staff includes software development and data science employees in Palo Alto. Arundo’s other activities in the Bay Area include developing technology alliances and collaborations, and managing investor relations. Early on, it was part of the Stanford-affiliated StartX accelerator program, as well as the IoT program at the Plug and Play Tech Center. Asked why Arundo is in the Bay Area, VP of Strategic Partnerships and Palo Alto office head David Fechter points to the scale of opportunities, the community and industry exposure the company gets from being here, and access to innovative technology partners. He also notes that many major industrial companies either visit or have innovation offices in the region: “Nowhere else in the world has a similar level of interest in meeting and finding new startups.”

SPOTLIGHT

Vivino (Denmark)

Prior to co-founding Vivino, CEO Heini Zachariassen was CEO and COO of BullGuard Ltd., a global internet and mobile security company that he also co-founded. When Zachariassen started Vivino in Copenhagen, the complexity of choosing a wine seemed daunting. He believed there was a better way of choosing wine than relying on in-store collateral and, only when available, critic ratings. His idea was to build a database of wine information that came directly from wine drinkers. The result was Vivino, which allows anyone with a cell phone to photograph any wine bottle's label, or even a restaurant wine list, and learn a wine's rating and average price and read reviews from a community of 25 million. A recent expansion gives users the option to buy wines online as well.

Vivino's engineering is done in Copenhagen, while the commercial end of the company is in the Bay Area, where US and global market expansion and business development are handled. Zachariassen says there are quality engineers available in Denmark at lower costs, and it's not difficult to attract them. But in the Bay Area another kind of talent is available: people who've started and grown companies before

and know how to do it. People in the Bay Area, he notes, think long-term, and want to make a big play—something less common in Denmark. And the stage is large, "It really flows to the entire world from here." A related draw has to do with market platforms: "If you're looking for a big consumer play it's likely that you'll be working with companies like Google, Facebook, or Amazon. If they're not here, then they're in the same time zone, so you really have to be in the Bay Area. You can do it in Europe, but it's less feasible."

Vivino had 15 employees in Copenhagen in 2012 when it did its first funding round with Creandum. Now, Vivino has raised USD 37 million with key investors including inaugural angel investor Janus Friis, co-founder of Skype; SCP Neptune International, the investment arm of Moët Hennessy's global Chairman and CEO Christophe Navarre; Balderton Capital; Creandum; Seed Capital; and Melo7 Tech Partners, LLC. Vivino now has a team of 85 in the US, Denmark, Italy, UK, India, France, Ukraine, and Spain, with its two largest offices in San Francisco (the corporate headquarters) and Copenhagen. Vivino currently has 25 million users, increasing at the rate of 15,000 per day.

SPOTLIGHT

Solved (Finland)

Solved provides a digital collaboration platform for on-demand cleantech advisory services. With 2,000 advisers available around the world, clients such as cities, real estate developers, and other businesses can get advice on how to meet cleantech challenges. Founder Santtu Hulkkonen started the company as a spinoff from Cleantech Finland (run by the Finland's global business promotion agency Finpro), which he led. Started as an "ask the expert" service, he saw an opportunity for the company to create a digital collaboration platform that would make expert consultation more efficient. The result was a scalable business model based on subscriptions with monthly payments. Early support was provided by Tekes in the form of advice, grants (for R&D and product testing) and loans.

The road to the Bay Area started with Nordic cleantech events in Silicon Valley supported by Cleantech Finland in 2008 and 2010, which gave Hulkkonen an early exposure to the region. In June 2016, Solved accompanied Finland's State Secretary in the Ministry of the Economy and Employment for a return trip, which helped Hulkkonen to connect with clients in the Bay Area and California. With the company already active in Scandinavia and Central Europe, Solved's first US clients—city organizations such as utilities—are in California. Because of the state's role as a cleantech hub, Hulkkonen believes the company needs to be here; either he or his CEO plans to move to the area, initially perhaps landing at an incubator that can provide advice, connections, and lower costs.

SPOTLIGHT

Fuse (Norway)

Fuse was founded in 2011 by Anders Lassen and Morten Daniel Fornes, two graduates of NTNU (Norway's leading technology university, located in the north of the country in Trondheim). Lassen, now the CEO, worked at Falanx, a GPU company, which was acquired by the UK semiconductor company, ARM in 2006. Lassen and Fornes saw a problem for developers who were producing apps for both iOS and Android devices—challenges that often required two teams of engineers and more maintenance, and led to higher costs. In response, Fuse developed a cross-platform native app development technology, which helps developers create one codebase and deploy it on multiple operating systems. The process also facilitates better cooperation between designers and engineers, since the designs that are developed also create code that engineers can use. To date, more than USD 12 million in funding has come from two Norwegian venture funds, Northzone and Alliance Venture.⁴³

With 60,000 users pre-launch, the commercial version of Fuse's product was launched in May 2017. The company currently has three offices: a headquarters in Oslo, and business development offices in Seoul and Palo Alto. Opened in 2014, the Silicon Valley office anchors marketing in the US and engagement with US partners. R&D is done in Norway. COO Sumi Lim observes that the company considered moving to the US, but concluded that excellent engineering talent could be found at home that would be lower cost and more loyal than highly-competed-for engineers in Silicon Valley. Norway, however, has much to learn from Silicon Valley about commercialization and international business development, which suggests that the Silicon Valley office has room to grow.

SPOTLIGHT

Zendesk (Denmark)

Zendesk CEO Mikkel Svane first visited San Francisco as a student in 1995 and came away changed: “The trip made everything more clear—the Internet was going to change everything. What I took home from San Francisco was the sense of being at the start of something big.” Returning home, he knew he wanted to start a company. In 2007, he launched Zendesk, a user-friendly corporate help-desk, with two partners in a Copenhagen apartment. Friends and a German angel invested. A subsequent visit to TechCrunch Disrupt confirmed for Svane that San Francisco was where he needed to be to build the business, but the first move to the US was to Boston, where the company found its first venture capital investor. It was 2009, and at that point Zendesk had nine employees.

The stay in Boston was short. Zendesk had developed a customer base in Silicon Valley and landed a Series B investment of USD 6 million from San Francisco-based Benchmark Capital. Soon after that they were on their way to California. As Svane puts it, “We always knew that there was much more startup action on the West Coast—and we always saw ourselves ending up there.” The company’s first office was at 410 Townsend Street, collocated with other startups such as Yammer and Eventbrite that would later emerge as industry leaders. Twitter, Airbnb, Uber, and Dropbox became Zendesk customers. Outgrowing its Townsend Street space, Zendesk found and renovated a derelict but classic 1906 building at 6th

and Market, in San Francisco’s frontier but trending mid-Market neighborhood, which today is its headquarters.

In 2014, seven years after being conceived in the Copenhagen apartment, Zendesk went public on the New York Stock Exchange. Today it has 1,700 employees, with its largest office in San Francisco and 14 others around the world, including development centers in Melbourne, Singapore, Dublin, Copenhagen, and Montpellier. It has more than 101,000 paid customer accounts in over 160 countries and territories.

Asked what makes the Bay Area unique for startups, Svane points to the large number of early adopters and early movers in the region, many of them other startups. Many of Zendesk’s early clients were other fast-growing Bay Area startups such as Twitter. But the advantages the region offers for startups are on an even larger scale: “It’s there even before you start. It’s such a mothership of innovation. There’s a sense of gravity in San Francisco and Silicon Valley—for us it was the same. TechCrunch was such an icon for us in the startup culture, representing Silicon Valley, and being in the Bay Area to develop relationships with other like-minded people and companies was key. This place is ahead of everything else. It’s true for every startup: if you want to be in the game, this is where the action is; it’s where the opportunities are and where you can learn.”

SPOTLIGHT

Peergrade (Denmark)

Founder David Kofoed Wind was a PhD student in machine learning at the Technical University of Denmark when demand for engineers with AI skills spiked and the size of the masters class he was teaching suddenly grew from 20 to 130. To address the grading burden, he came up with Peergrade, a peer assessment platform to distribute the student evaluation process. Students upload their work to the Peergrade site, where the work is then automatically distributed between multiple students who then anonymously review and give feedback on their classmates' work. Teachers can average responses, add their own perspective, and get data-driven insight into their students' performance. Students give and receive feedback with their peers, and everyone learns in the process. More immediately, the time required to review papers is greatly reduced, and the process incorporates proven statistical tools to ensure that everyone is evaluated fairly.

After the evaluation platform got started on his own campus and it became apparent that this could be a business, other universities began picking it up, and Wind launched the company in 2015. Some believed that the process might work for teaching technical subjects such as computing where there's only one right answer, but not for social science. When Peergrade's approach was applied to social science subjects at the University of Copenhagen, however,

it turned out to be subject-matter agnostic and applicable to any field.

The company received its first investment in December 2016, from Nordic angels and a UK-based accelerator. Government grant money also came in from the Danish Innovation Fund. After participating in two accelerator programs, in London and Copenhagen, in the spring of 2017 the company was invited for to interview with Y Combinator and subsequently participated in the program from June to August. The plan now is to return to Denmark, leverage the Bay Area experience to attract a small seed round, and decide later whether to stay in Denmark, move to the US, or have a base in both places. A dual presence appears most likely, since good engineers can be found in Copenhagen for a fraction of the cost in Silicon Valley, but the Bay Area has strong advantages in marketing and customer development.

Peergrade has a number of early clients, including 15 institutions (universities, business schools, and high schools) with licenses. There's also a free version that any teacher can use. Teachers aren't expected to completely remove themselves from the grading process, as there's still a need to review the input, but Wind believes the company's system can cover 90 percent of the grading process: "It's the future."

SPOTLIGHT

Neo4j (Sweden)

Swedish entrepreneur Emil Eifrem launched Neo (the predecessor company to Neo4j) in 2007, and received his first seed investment in 2009. After receiving Series A funding in 2011, he moved his company to the Bay Area in the belief that it would have a greater opportunity to grow here. To date Neo has received five rounds of funding from six investors, including US investor Fidelity and Nordic VCs such as Sunstone Capital, Conor Venture Partners, and Creandum.

Neo4j works with big data, using a graph database based on how the human brain structures information to identify relationships and make connections across myriad data sources. Headquartered in San Mateo, it has 200 employees around the world, including Sweden, Germany, France and the UK. Product development and engineering are done in Europe, with commercial functions (customer-centric engineering, management, business development and marketing) managed from the Bay Area.

Eifrem notes that it's easy to start a company in both the Bay Area and Sweden, and that there are good Swedish venture firms that can write checks for EUR 2-5 million. What is different about the Bay Area is

its center of gravity and access to capital. While high quality engineers are plentiful in Europe, "Silicon Valley is mind-blowing for non-engineering roles. It's almost impossible to find world-class heads of marketing or business development in Sweden, while there is a much higher density in the Valley. The region has at least an order of magnitude advantage in access to world-class talent and has a willingness to share. When you add these factors together, it's an explosive combination. You can't find it anywhere else on this planet."

The company's 200+ paying clients include UBS, Walmart, Dun & Bradstreet, Cisco, FT, LinkedIn, HP, and eBay. In a commercial setting, Neo4j's technology can be used, for example, by online retailers to give customers recommendations based on past purchases, or by banks for fraud protection. Its greatest visibility so far, however, came in 2016 when the International Consortium of Investigative Journalists used the company's open source technology to connect the dots of more than 11.5 million documents exposed through the Panama Papers—an international research effort that exposed hidden wealth, secret transactions and corruption by many of the world's government and private elites.

SPOTLIGHT

Starship (Denmark and Estonia)

Starship was created by two founders of Skype, one Danish and the other Estonian, several years after Skype was sold to Microsoft. At a 2014 meeting in London, they agreed to form a company to bring disruptive innovation to the delivery service industry by completing the last mile of local delivery through robots.

The company's technology is developed in-house, with almost 50 engineers in R&D (half of whom have worked for Skype) in Estonia. Other offices are in Redwood City; Washington, DC; London; and Zurich. The initial focus was on restaurant deliveries (take-out food), the first service launched in London and Germany in 2016, and US service launched in Washington, DC in 2017. Redwood City is the first city in the Bay Area, with 16 robots operating, and San Carlos, Walnut Creek, Concord, and Sunnyvale have approved operating permits; the company expects to be operating in up to ten Bay Area cities by the end of 2017. Laws enabling the service have also been passed by five US states (Virginia, Idaho, Wisconsin, Florida, and Ohio), as well as by cities including Austin and Fayetteville. Food delivery partners include Postmates, DoorDash, and Domino's in the US, and Delivery Hero in Europe.

A US company, Starship is building a headquarters and hiring staff in the Bay Area, currently the location of 16 out of Starship's 50 US employees, and the company expects to double that number by the end of 2017. The robots are designed and manufactured in Estonia with an added touch of industrial design by Aivan from Finland. The software and hardware are developed in Estonia by a team with members of 13 nationalities. While most of its DNA is European, Starship is looking to build a company that operates on two continents. Both European and Bay Area venture firms have invested.

SPOTLIGHT

Yubico (Sweden)

Yubico, a company with Swedish roots, was founded by CEO Stina Ehrensvärd with the goal of developing a new global internet security standard. Starting in Stockholm in 2007, Ehrensvärd and her husband, with backgrounds in product design and computer engineering, sold their product—a security device that supports computer encryption and authentication protocols to enable secure user access and can't be hacked or phished—online. They moved to the Bay Area in 2011 after Google became a customer, and since then hundreds of companies including many of the world's largest technology leaders have signed on. Profitable for five years, Yubico employs 100 people today and expects to double the number next year. Twenty-five staff including the core engineering team are in Stockholm, half of them non-Swedes; 95 percent of revenue comes from outside Sweden, 80 percent from the US.

Ehrensvärd likes being rooted in Silicon Valley and Stockholm, both international hubs. She values the ambition and energy of the Bay Area, but also likes Sweden's flat management style, where people are independent but can also work in teams—a valuable asset when working on complex technology projects. She also thinks that Sweden is becoming a more positive place for entrepreneurs than it was only a few years ago, with more good mentors and role models. With new offices in Japan and Australia, Yubico has graduated from startup status to becoming an international growth company.

How They Grow

It is important to recognize that overseas startups come to the Bay Area for many reasons and along different pathways. Some may pass through an incubator or accelerator program and go home, taking with them new relationships and insights into how Silicon Valley works. This is often the case with very-early-stage companies that don't yet have products. Later-stage companies, which are closer to being market-ready, are more likely to come looking for partners or investors. Their goal is typically to make connections that will enable their expansion into the US and global markets.

Often, the startups that gain traction will move their management team and headquarters to the Bay Area, with one or more of the founders relocating. Venture investors, who prefer their portfolio companies to be close, often encourage this. This is particularly true when the investor takes a seat on the board, or wants to bring in co-funders. As one venture investor put it, "If we fund you, we want you here. There's a big network opportunity to connect you with smart people around product design, funding, and marketing. You have a better opportunity of making money if you come here."

A US-headquartered company will usually maintain an affiliate presence in its home country to handle operations there. In other cases, the European company will keep its headquarters and leadership team at home and create a US affiliate. This may involve an exchange of shares of the home company for shares of a newly-established Delaware corporation. The company's intellectual property usually remains in Europe (for tax reasons), but new IP may be developed in the US.

In either case, the pattern that most often emerges reflects a division of labor, where different and complementary tasks are performed in the Bay Area and at home. Frequently this relates to the high cost of employing engineers in the Bay Area and the availability and lower cost of engineers of comparable quality in Europe. Though to a lesser degree, early-stage government funding tied to local employment or to subsidies for R&D can also be a factor that ties a company's operations to its home country.

Bay Area offices usually source investment and lead expansion into US and global markets, drawing on an experienced cadre of managers with global experience. Home offices typically provide infrastructure and engineering support. As a result, the employee count at home may be larger, even if the company becomes US-headquartered. Both the Bay Area and the home country gain: the Bay Area through an infusion of companies and talent, and the home country through the increased employment, revenue, and visibility that comes from having a successful global company that is more competitive and has grown faster than it could have had it stayed at home.

Building the Nordic Connection

The Nordic region plays a significant and growing role as an economic partner for the Bay Area. Its presence is marked not only by large technology companies such as Nokia and Ericsson, but by large numbers of startups that come to the region to source funding, to partner, and to scale and grow globally. In the process, some such as Zendesk have become major global companies. The relationship builds on a foundation of innovative capacity that distinguishes the Nordic countries—Sweden, Denmark, Norway, Finland and Iceland—from other countries relative to their economic size and population. They also share a positioning that aligns closely with the prevailing Bay Area/Silicon Valley ethos: an orientation toward innovation and entrepreneurship, and an ambition to grow globally. This offers high-value opportunities for the Bay Area and complementary benefits for its Nordic partners.

Interviews and Informational Support

Bay Area

Knud Balslev, Director of Business Development, Cryptomatic (Denmark)
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 Burton Lee, Managing Director, Innovarium Ventures and Director European Innovation and Entrepreneurship Program, Stanford University (US)
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