

survive and thrive

winning against strategic threats to
your business

A Rotman Strategy Book

Edited by Joshua S. Gans and Sarah Kaplan

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Survive and Thrive: Winning Against Strategic Threats to Your Business

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finding the right innovation ecosystem

Ajay Agrawal and Alberto Galasso

For several years, Abraham Heifets had worked on applying recent advancements in artificial intelligence to drug discovery. Developing a new medicine takes an average of fifteen years, and Heifets had devised a way to shrink the process to a fraction of that time using advanced machine-learning algorithms running on a supercomputer. He enthusiastically pitched his idea to all the top venture capital firms in his hometown of Toronto, but the reaction was always the same: Potential investors liked the idea, but people weren't willing to commit their capital. They wanted more-detailed business plans, requested more evidence, and demonstrated no sense of urgency. Heifets became increasingly anxious as his funds wore thin, and eventually, he realized that he had to relocate his business to Silicon

Valley, where investors would understand the potential of his idea and would be willing to get involved at an early stage.

The move proved to be a wise decision. By June 2015, Heifets's company, Atomwise, had raised \$6 million in seed funding from five leading science-focused venture capital firms, and soon after, it announced collaborations with Merck, Notable Labs, and the Harvard Medical School.

The issues faced by Heifets are not uncommon among high-technology entrepreneurs during the early stages of their ventures. Without a doubt, Silicon Valley is widely celebrated as a start-up haven because of its abundance of experienced talent, capital, and experimental culture. At the same time, though, the Bay Area is also well known for its high cost of living¹ and fierce labor-market competition. Thus, buying a one-way ticket to California makes sense only if the benefits of relocating outweigh the costs. For Abraham Heifets, the move to Silicon Valley may well have saved his fledgling business; in Toronto, Atomwise might have died from a lack of funding and partnership opportunities. Given the financial and other costs of relocating, however, other high-tech entrepreneurs might be better off staying put in their hometowns. What factors, then, should people consider when making such a momentous decision?

Drawing on two decades of research in strategy, economics, and geography, we have developed a simple framework that high-tech entrepreneurs can use to inform their location strategies. The framework, which takes into ac-

count the key forces that shape regional entrepreneurial success, is useful not only for start-up companies but also for large corporations because the location decision of entrepreneurs is not only shaped by but also shapes the location decision of certain types of large businesses. Moreover, our framework has important implications for policymakers who are responsible for designing strategies to enhance the desirability of their jurisdictions.

eight crucial factors

Beginning in the mid-1990s, a large number of studies spanning diverse academic disciplines identified a variety of forces that affect entrepreneurial activity at the regional level. Our reading of this body of literature suggests that the most important regional characteristics for a vibrant entrepreneurial ecosystem can be classified into eight categories: investors, customers, suppliers, labor pool, competitors, institutions, culture, and social network. These eight factors shape the entrepreneurial success of a region by influencing the entry of new high-tech firms and by creating conditions that affect the growth of those firms. As will be discussed below, these forces are not independent of each other; entrepreneurship tends to flourish in regions scoring high across multiple factors.

- 1. Investors.** For high-tech entrepreneurs, the availability of venture capital across multiple levels of investing

stages (angel, seed, Series A, and Series B) can be the difference between the success or failure of a start-up business. Investors vary in terms of their tastes for certain markets and technologies, their risk tolerance, their knowledge about specific sectors, and the other investments in their portfolio that might restrict subsequent investments because of conflicts. An ample supply of venture capitalists in a region therefore significantly enhances the probability that an entrepreneur will be able to find a good match. It should be noted that more than half of the venture-capital offices listed in the Pratt's Guide to Private Equity and Venture Capital Sources are located in three centers: Silicon Valley, Boston, and New York.² It's also important to remember that venture capitalists are more likely to provide funding and serve on the boards of companies that are local because geographical distance constrains their ability to monitor their portfolio companies and coach the management teams of those businesses.³

2. Customers. It's natural for new firms to start selling their products locally before expanding to national and international markets. Thus, the level and quality of local demand will influence the initial growth of a start-up. For one thing, a large local demand can lead to cost savings by allowing firms to spread their fixed costs over a larger customer base. Local customers may also provide crucial insights to develop and fine-tune a firm's products. Furthermore, sophisticated and demanding regional cus-

tomers can help a firm spot new trends and promising market segments. Often, the ongoing feedback obtained from early customers is so important that these customers play the role of development partners.⁴

3. Suppliers. Being located close to a dense network of suppliers is advantageous for a number of reasons. First, it reduces transportation costs and waiting times for inputs. CEO Jeff Bezos's decision to locate Amazon in Seattle, for example, was primarily because of the short distance from one of the largest distribution warehouses for books in the country. Second, the technological needs of a start-up are often fully understood only with frequent interaction with its suppliers. Third, the presence of multiple suppliers in one area allows the entrepreneur to shop for the best price, quality, and product fit. Lastly, some regions provide a natural advantage related to inputs for certain industries, and because office space is a key variable, an assessment of the regional real-estate market should also influence a location strategy.⁵

4. Labor pool. Start-ups must assess the presence of workers specialized in the relevant fields as well as their own ability to attract key talent to the region. Larger labor pools allow firms to find the best matches for their specialized occupations and also have an impact on the number, quality, and diffusion of entrepreneurial ideas. A variety of studies have shown that specialized workers tend to agglomerate in a limited number of locations. Very often, the

supply of specialized workers is shaped by the presence of universities, hospitals, and research institutes in a region. It's important to recognize, however, that universities vary substantially in their propensity to cooperate with industry and support local entrepreneurship. One of Silicon Valley's greatest advantages is that it has a disproportionately large labor force with experience in scaling start-ups.

5. Competition. High-tech entrepreneurs must assess the competitive landscape, with special attention to other start-ups present in their region. On one hand, there are clear benefits to being insulated from competition. On the other hand, a variety of economics and management studies have shown that competition can play an important role in disciplining managers and spurring innovation.⁶ When assessing a regional environment, high-tech entrepreneurs should avoid having a narrow focus and considering as competition only firms with similar products and technologies. They should also assess the nature of competition in terms of inputs, talent, and funding. Special attention should be paid to large companies present in the area, which can have a profound impact on the regional economy by stimulating the demand for new technology from start-ups and by attracting a skilled labor force. Our research has shown that innovation productivity is greater in regional environments where sizeable populations of both small and large firms coexist.⁷

6. Institutions. An effective location strategy requires careful assessment of the strengths and weaknesses of the regional economic and political institutions.⁸ In particular, high-tech entrepreneurs should monitor local taxation levels, backlogs in regional courts, and trends in regional business legislation. Transport infrastructures such as airports, train stations, and roads may also have an important impact on the firm's ability to interact with customers, suppliers, investors, and competitors.

7. Culture. Picking the right location requires a good grasp of the cultural norms across different locales. Silicon Valley, for example, is known for its unique forgiving attitude toward entrepreneurs who have failed in previous ventures. Particular attention must also be paid to the local acceptance of different demographic and ethnic groups within a region, as this may influence the ease with which foreign talent may be recruited to the region.⁹

8. Social network. Individuals are embedded in local networks of social relations generated by their family, friends, and civic ties. The social capital derived from these personal relationships can be very important for entrepreneurs to raise capital and to attract employees, suppliers, and customers. This has important implications for location strategies. First, the profitability of a move to Silicon Valley is less clear when entrepreneurs have deep social networks in their home locations. Second, those regions where

newcomers can quickly form and leverage social connections are more attractive than those where integration is more difficult.¹⁰

a tale of two regions: Toronto and Silicon Valley

As discussed earlier, Abraham Heifets had trouble raising capital for a promising technology breakthrough until he relocated his business from Toronto to the Bay Area. Other Toronto-based entrepreneurs have been able to thrive in the capital, however. Mike Serbinis, for example, was successful in raising a \$25 million Series A round of funding, largely from Toronto-based investors, for his digital health platform company, LEAGUE. To better understand the crucial stay-or-relocate decisions made by entrepreneurs like Heifets and Serbinis, let's now apply the eight-factor framework to compare Toronto with Silicon Valley from the perspective of a high-tech start-up.

1. Investor comparison. The Greater Toronto Area (GTA) is roughly comparable to Silicon Valley in terms of population size, but the level of funds available for entrepreneurial businesses is much smaller. In fact, the level of venture-capital investment in the GTA is roughly one-tenth that of San Francisco and one-fifth that of Boston. Furthermore, regions with smaller pools of early-stage cap-

ital are likely to have thinner markets of investors with specialized expertise.

2. Customer comparison. Markets may be broadly classified as either consumer or enterprise. On the consumer side, the population of the GTA is only slightly smaller than that of the Bay Area (roughly six million compared to seven million), so for consumer-oriented products, these markets may be similarly attractive. The demographics and preferences of consumers may differ in crucial ways across these two regions, however. For example, in the case of technology products, even though Toronto is roughly the same size, many argue that the Bay Area is a more attractive market to launch in because a high fraction of its residents are early adopters who are willing to try new products and services such as ride sharing (Uber, for example), house sharing (Airbnb, for example), and on-demand valet parking (Luxe, for example).

The geographic distribution of enterprise customers is another important variable. Consider financial services. By various measures, Toronto is the second-largest financial center in North America, after New York City but ahead of Chicago, Boston, and San Francisco.¹¹ Not surprisingly, Toronto is home to a number of promising financial technology (fintech) start-ups such as WealthSimple. To date, however, the highest-profile start-ups in this industry are not based in Toronto but rather in Silicon Valley (PayPal and Square, for example). Even in Canada, a surprising

number of prominent fintech firms are based outside of Toronto: Shopify (Ottawa), Verafin (St. Johns), Lightspeed (Montreal), Blockstream (Montreal), and Zafin (Vancouver). This hints that even though there's a much larger potential customer base for financial services in Toronto compared to the Bay Area or other regions in Canada, the financial-services companies in Toronto may not be sufficiently engaged as customers of new innovations to give fintech start-ups in the region an advantage.

3. Supplier comparison. Toronto has limited manufacturing of electronic products relative to the Bay Area. Furthermore, many inputs that are not available locally are imported from the United States, often involving nontrivial shipping and tariff costs. Moreover, many other inputs are imported from China. Thus, for hardware-related companies, Toronto faces a supplier disadvantage relative to Silicon Valley. In contrast, Toronto offers a greater supply of office space, which is significantly more affordable than that in Silicon Valley, and the region is attempting to capitalize on that advantage. For example, Kitchener-Waterloo in the GTA recently announced that it would build a large innovation complex specifically aimed at new hardware companies. This complex, which will exceed the size of a similar pioneer facility in Shenzhen, China, is designed to attract companies specializing in contract manufacturing, radio frequency testing and certification, and IT law.¹²

4. Labor pool comparison. Human capital either inexperienced or experienced *with respect to scaling* represents two distinct types of highly skilled labor. Inexperienced highly skilled labor is well trained and may have years of experience working at small or medium-sized enterprises. These individuals, however, have not participated in the rapid scaling of an organization. Experienced labor is not only well trained but also has participated in the rapid growth of an organization that has increased its market capitalization by, for example, one hundred times. Toronto arguably has a more attractive environment than the Bay Area for inexperienced highly skilled labor. Toronto-based talent is equally well trained yet less expensive and less likely to be poached than Silicon Valley-based counterparts, but Toronto has only a limited supply of highly skilled labor with experience in scaling, which involves growing a user base from zero to hundreds of millions of users, raising billions of dollars in equity capital, taking companies public, recruiting thousands of engineers and software developers, and outsourcing hardware manufacturing to China. Furthermore, even when Toronto-based high-tech companies do achieve product-market fit and begin to grow quickly, when compared to Silicon Valley-based start-ups, they often struggle to attract experienced talent to relocate because prospects worry that if the opportunity doesn't work out, there might be limited other attractive opportunities available in the GTA.

5. Competition comparison. Toronto is home to many large foreign tech companies, such as Cisco, Google, Uber, and Facebook, but the size and nature of their operations (predominantly sales offices) are modest and less conducive to meaningful contributions to the entrepreneurship ecosystem relative to their presence in Silicon Valley. More promisingly, General Motors recently announced plans to hire 750 people in the next two years to work on driverless cars, particularly on cold-weather features. It should be noted that start-ups in the GTA have flourished where competition has been high. For example, over the past five years, the region has emerged as a front-runner in the area of wearable technologies, led by start-ups such as Thalmic Labs, Nymi, PUSH, Muse, and Magniware, and inspired by Steve Mann, who founded the Wearable Computing Lab at the MIT Media Lab and subsequently moved to the University of Toronto (and is widely referenced as the Father of Wearable Computing).

6. Institution comparison. The Ontario government has implemented a variety of policies supporting small businesses (such as the Youth Entrepreneurship Fund and the Starter Company Program) and offers tax rates that are lower than the average of G20 countries. Moreover, tech companies also benefit from the Scientific Research & Experimental Development (SR&ED) tax credit, a Canadian innovation funding program that returns over C\$3.4 billion to companies every year. In addition, Toronto has been

ranked as the best city to live in North America according to the 2015 Safe Cities Index. Finally, healthcare is significantly more affordable in Canada than in the United States, especially for credit-constrained entrepreneurs. At the same time, several of the most dominant large industries in the GTA are heavily regulated and thus protected from global competition (for example, banking, insurance, and telecommunications). As a result, these industries do not seem to foster technology entrepreneurship at a level commensurate with their size. Thus, start-ups in these regulated industries are significantly more prolific in the Bay Area, despite there being fewer established firms from those industries in that region.

7. Culture comparison. Like the Bay Area, Toronto is well connected to other prominent metropolitan areas in North America, given its geographical location and its large international airport. Overall, Toronto has a vibrant, creative community and a number of strong engineering and science programs linked to educational institutions (such as the University of Toronto and the University of Waterloo) that are similar on most important dimensions to those in the Bay Area (such as UC Berkeley and Stanford). Given that foundation, it's not surprising that the GTA has a healthy concentration of technology talent: About 55 percent of technology workers in Ontario and about 26 percent of all technology workers in Canada are employed in Toronto.¹³ Although Toronto has a vibrant and growing

technology entrepreneurship community, the dominance of this culture does not compare to that in Silicon Valley. The executive director of C100, an association for Canadian entrepreneurs in San Francisco, recently had this to say: “Tech is everywhere here [in Silicon Valley]. It’s in the coffee shops, it’s on street corners, it’s in restaurants, it’s in everyone’s conversations.”¹⁴ This reflects not only the density of the technology-oriented labor market in the Bay Area but also a cultural mindset regarding risk taking, work ethic, growth aspirations, and other characteristics.

8. Social network comparison. A strong local social network is one of the most likely reasons for an entrepreneur to stay at home rather than move. One widely referenced characterization of entrepreneurship, coined by Howard Stevenson of the Harvard Business School, is this: “the relentless pursuit of opportunity without regard to resources currently under control.” Entrepreneurs leverage every asset they have in their pursuit of opportunity. For those with a wide and valuable local social network, this becomes an important asset to leverage for access to capital, key recruits, customers, suppliers, regulators, and so on. Although Silicon Valley is well known as an open community where outsiders are able to establish social networks over time, such establishment still takes effort and resources and thus may be relatively costly for individuals who already have strong social networks at home.

advice for high-tech entrepreneurs

The eight-factor framework discussed in this chapter indicates the key issues that high-tech entrepreneurs must examine to assess the desirability of potential locations for their start-ups. In deploying that framework, entrepreneurs should also consider the following.

There is no universal “best” strategy. The effects of a relocation will differ across various start-ups. To assess those effects, entrepreneurs should use a two-step process when evaluating the framework presented in this chapter. First, they should assess how important each of the eight factors is for their venture. For example, cash-starved start-ups like Atomwise should give a much larger weight to investors than to suppliers. In contrast, start-ups that have secured capital and aim to scale up quickly should give large weights to suppliers and labor pools. The second step is to contrast the local ecosystem with the new location by focusing on the key factors that were identified in the first step. Relocating is likely to be the right strategy for a venture only if the new location significantly outperforms the local region for the most salient factors.

Mispriced factors can undermine the analysis. Picking a location is a key strategic decision that has a long-term impact and is difficult to reverse. It is thus crucial to price correctly the factors affecting the location strategy. Some entrepreneurs overestimate the costs (both monetary

and nonmonetary) of moving and treat their business sites as cast in stone, while others underestimate those same costs. Particular attention should be paid to the value of a local social network, which is one of the most likely reasons for an entrepreneur to stay at home rather than move. For example, although Silicon Valley is well known as an open community where outsiders are able to establish social networks over time, establishing a network takes effort and resources and thus may be particularly expensive for individuals who already have strong social networks at home. Such was the case at Nymi, a Toronto-based start-up producing wearable devices that deliver biometrically secured authentication. A strong local network gave Nymi an advantage in building a team and in obtaining early seed-stage funding. Doing the same outside Toronto would have been much harder and would have required the firm to divert more time and resources away from its core business.¹⁵

The right innovation ecosystem can change over time. A start-up that moves may find at a later stage that it makes better sense to return to its home location. Take, for example, Taplytics, a Toronto start-up specializing in A/B testing. The company had previously relocated to the Bay Area because at that time, the founding team wanted to be close to Silicon Valley's network of investors, competitors, and customers. As time passed, however, Taplytics' products started gaining traction with a number of prominent corporate clients located elsewhere, including Target,

Indigo, and the Globe and Mail. Management then realized that the benefits of being physically located in California had decreased and that relocating to Toronto could substantially increase the firm's profits because of the lower tax rates and cost of talent.

Strengths of the local ecosystem should not be overlooked. The eight-factor framework not only is useful for deciding whether to leave a location but also can help entrepreneurs identify the strengths of their local ecosystems and develop strategies that leverage those regional advantages. For example, start-ups could identify areas in which local universities display research excellence, and then use that valuable information to improve their recruiting and product-development strategies.

Stay and leave are extremes along a continuum of possibilities. Entrepreneurs may also consider straddling their home cities and new locations, perhaps through frequent travel between the two sites, the temporary rental of office spaces, or the opening of a permanent satellite office. For instance, Karl Martin, the founder of Toronto-based Nymi, flies to Silicon Valley every six to eight weeks to meet with his US investors. Venture-capital firms may also provide different mechanisms for straddling two locations. For example, the California-based accelerator 500 Start-ups offers a program that allows selected start-ups to connect with mentors and industry experts in Silicon Valley

without leaving their home locations.

policy implications

The framework also provides important insights to policymakers aiming to enhance the economic desirability of their jurisdictions. In developing policies to spur local innovation and to attract and retain talent, the following need to be considered.

Effective regional policies should target multiple aspects of the local economic environment. Focusing exclusively on only one factor may not be as effective as a multifactor approach. In other words, exploiting just one policy lever (for example, attracting high-skill workers) could help spur some business growth, but not nearly as much as would the implementation of a mix of policies (reducing taxes to new firms, investing in the transportation infrastructure, funding local arts organizations, and so on).

There is no universal “best” policy. Rather, the optimal policy depends on the economic and social conditions of the region at a given time. For example, a region with a vibrant capital market but without a large pool of talent may benefit more from policies designed to incentivize the activities of universities and research centers rather than from policies aimed to attract more investors.

Conversely, a region with a strong research environment but without a substantial presence of venture capital may benefit most from policies that help attract investors.

lessons for CEOs of large firms

The eight-factor analysis is also useful for the CEOs of global corporations. That's because the location decision for entrepreneurs is not only shaped by but also shapes the location decisions of large firms. For example, Boston's thriving start-up ecosystem was a crucial factor behind the recent move of General Electric from Connecticut to Boston. As CEO Jeffrey Immelt said in a statement, GE wanted "to be at the center of an ecosystem that shares our [GE's] aspirations." Similarly, GM recently announced that it would expand its presence in Canada, attempting to attract Canadians back from Silicon Valley, primarily to work in the province of Ontario. The plan is to hire 750 people in the next two years to work on driverless cars, particularly on the cold-weather features of those vehicles. GM selected Canada for the expansion "because of its clear capacity for innovation, proven talent, and strong ecosystem of great universities, start-ups, and innovative suppliers."

Local high-tech entrepreneurs can profoundly affect large firms' profitability. First, large companies may be especially well positioned to exploit innovations generated by local high-tech start-ups, not only as customers but

also as acquirers. For example, in the area of artificial intelligence, Salesforce acquired Palo Alto's MetaMind for about \$30 million, GM acquired San Francisco's Cruise for more than \$1 billion, and Google acquired London-based DeepMind for more than \$500 million. In addition, technology start-ups are often an important source of talent for large companies. It's important to note, however, that the flow will generally be in both directions, as specialized high-skill workers are likely to behave differently when large and small firms coexist. Specifically, our research has shown that employees of large firms are more likely to leave their companies and become entrepreneurs when a large number of high-tech start-ups are present in the region. This is because the presence of many small firms generates a thick local input market and spurs a culture of entrepreneurship that lowers the risks and costs of starting new entrepreneurial ventures.

Ecosystems evolve dynamically. In using the eight-factor framework to assess an ecosystem, CEOs of large corporations should consider not only the current levels but also the trends in the economic forces underlying the various factors. For example, the population of the metropolitan area of Austin, Texas, is currently experiencing very fast growth (annual increase of 3 percent) and is expected to soon exceed three million people. In such a dynamic environment, the numbers and characteristics of consumers, suppliers, and specialized workers are likely to change con-

siderably, as will the characteristics of the supporting infrastructure.

Ecosystems can be shaped. The eight-factor model can provide corporate CEOs with guidance on how to invest in their ecosystems in ways that will increase their organizations' competitive advantages. In February 2015, for example, Uber announced a strategic partnership with Carnegie Mellon University in Pittsburgh to develop a leading cluster of experts in driverless-car technology. Similarly, Google has shaped the Toronto-Waterloo regional ecosystem by investing in organizations such as Communitel and the University of Waterloo.

The eight-factor framework presented in this chapter indicates the key issues that high-tech entrepreneurs must examine to assess the desirability of potential locations for their new ventures. Decades of research on innovation ecosystems and entrepreneurship have shown that these factors are particularly important determinants of a thriving regional environment. Ignoring them may lead founders to pick the wrong locations, resulting in potential difficulties in attracting the necessary funding, talent, suppliers, partnerships, and customers. Assessing them properly will lead to the best location choices, however, setting the stage for their start-ups to flourish instead of wither.

endnotes

1. In early 2016, the Palo Alto City Council voted to study a proposal that would essentially subsidize new housing for families earning less than \$250,000, an upper limit that would place such a family approximately in the top 2 percent of the overall income distribution in the United States. See <http://sanfrancisco.cbslocal.com/2016/03/22/250k-per-year-salary-could-qualify-for-subsidized-housing-under-new-palo-alto-plan/>.)
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