ISRAEL: STARTUP NATION

Israel is home to one of the world's leading startup ecosystems, with some metrics of success tracking closer to the U.S. and China than other nations its size. With a small population of 8+ million people, it has more than 5,000 technology companies,[1] which account for 50% of GDP.[2] It has the highest number of startups per capita in the world.[3] It has 76 companies listed on the tech-heavy NASDAQ exchange, ranked third after the U.S. and China.[4] In 2016, Israel attracted $4.8 billion in venture funding, a far cry from the $58MM received in 1991.

Not bad for a small, arid country that has no natural resources – except for its highly educated and diverse immigrant population – and no local trading partners. Because it is so fully surrounded by enemies, it has unique security needs. The geography is mostly desert; developing agriculture is a challenge. What's a country to do?

The answer has been to innovate. In medicine, irrigation, energy (solar), communications, military, security – all roads lead to technology solutions developed by its engineering-minded Eastern European immigrants.

Golda Meir, former Israeli Prime Minister (1969-1974), once said about Israel's geography: "Moses dragged us for 40 years through the desert to bring us to the one place in the Middle East where there was no oil." To which, Moshe Hogeg, managing partner and chairman of Singulariteam, an Israeli VC Fund, says today: "It is indeed a question of survival. We must continue to innovate. Israel is surrounded by enemies and we don't have natural resources. This means that our number one commodity is the brain. Israelis have also understood that success is not served on a silver platter: you will only win if you are better."

[1] IVC (http://www.ivc-online.com)
[2] Ministry of Treasury (http://www.financeisrael.mof.gov.il/FinanceIsrael/Pages/En/Home.aspx)
[3] StartupBlink (http://www.startupblink.com)
[4] NASDAQ (http://www.nasdaq.com/screening/companies-by-region.aspx?region=Middle+East&country=Israel)

Like China in the 1980s, the Israeli government developed a startup strategy in the 1990s. The strategy was to leverage its human capital by jumpstarting the startup sector with government funding, investment capital, and applied R&D; and using universities with strengths in technology, medicine, and science to develop incubators for startups.

“The theory is that you can artificially create a cluster by concentrating resources, finance and competences to a critical threshold, giving the cluster a decisive, sustainable, competitive advantage over other places,” writes Steve Blank, author of the Startup Owner’s Manual. “Israel, Singapore and now China are the three countries that have successfully put that theory into practice.”

Five percent of Israel’s national budget is invested in high-tech companies of all stages, through various plans and grants of the Office of the Chief Scientist in the Ministry of Economy (recently renamed the Israeli Innovation Authority). In 1993, the Israeli government formed Yozma 1 ("initiative"), a non-profit $100 million venture fund to co-invest, dollar for dollar, with private, international investors in new funds. Yozma catalyzed the establishment of 10 venture capital funds, contributing up to 40 percent of the initial capital investment in each fund. The rest was provided by foreign investors, who were attracted by risk guarantees. The Yozma 1 fund invested in 40 companies in three years; nine companies went public or were acquired. By 1996, $100 million was worth $250 million. In 1998, with roughly 30 private funds up and running, the government sold Yozma to private investors.

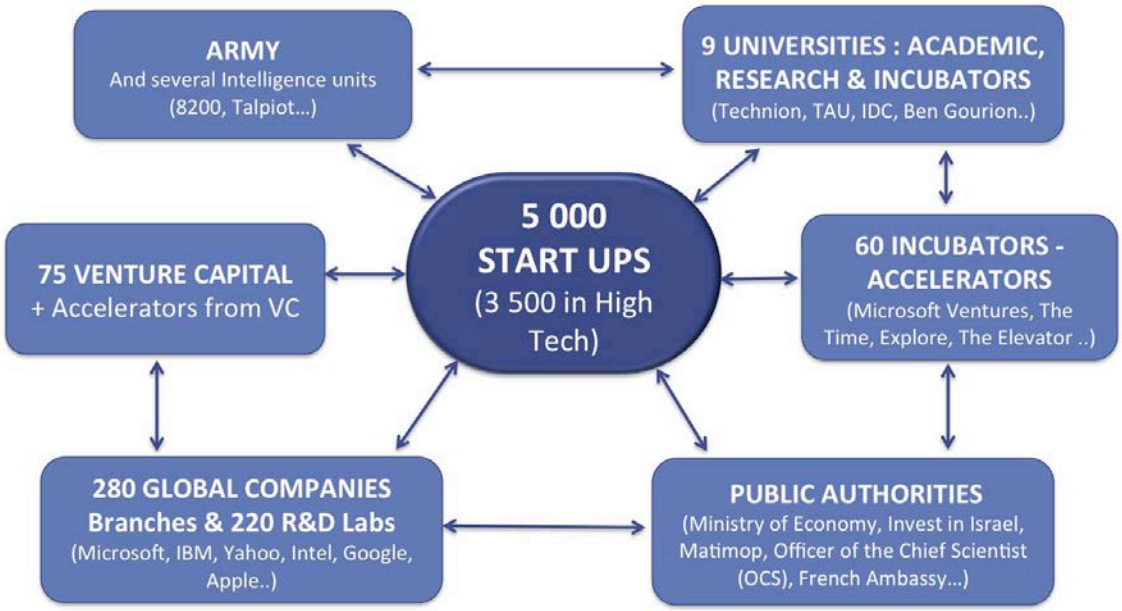
Yozma II in 1998 and Yozma III in 2002 were similar investment vehicles; by 2008, Israeli VC funds totaled $6 billion under management. An OECD report at the time called Yozma “the most successful and original program in Israel’s relatively long history of innovation policy.”

Israel's Office of the Chief Scientist also started six "incubators" designed to foster seed and early-stage technology development through entrepreneurship. This amplified the venture funding, and annual investment increased 60-fold between 1991 and 2000 – from $58 million to $3.3 billion. The number of startups increased from 100 to 800. By 1999, Israel ranked second only to the United States in invested private-equity capital as a share of GDP. It also led the world in the share of its growth attributable to high-tech ventures: 70 percent.

Today, Israel has 24 such incubators. Last year, for example, Renault-Nissan won a tender held by the Israel Innovation Authority to found a technological innovation laboratory in Tel Aviv as an incubator for startups developing smart-car and shared-transportation technologies. Startups selected for the incubator will receive government funding of up to NIS 1 million upon meeting some feasibility benchmarks. Over the past two years, seven new companies were founded to protect connected cars from hackers.

"The Israeli government made a crucial strategic decision to jumpstart a science-based sector by providing financial support for commercial R&D," says Israeli venture capitalist Dr. Orna Berry, who was Chief Scientist from 1996 to 2000. "This policy made up for market failures and the heightened risk of operating in a geographically isolated market like Israel." Through the Chief Scientist's matching grants program, grants are awarded on a competitive basis, with between 66 and 90 percent of the research costs covered. These grants are actually high-risk loans – successful projects must pay back the Office of the Chief Scientist the funding received via a deduction of a small percentage of annual sales.

THE ISRAELI ECOSYSTEM OF INNOVATION



Source: http://blog.leweb.co/2014/11/israeli-startup-ecosystem/#.WgR8aqLqVfk

HUMAN CAPITAL, HONED BY THE MILITARY

At the same time as Yozma, R&D funding, and incubators were being set up during the 1990's, nearly 1 million Russian Jews emigrated to Israel, many of them leading scientists and engineers. This represented a 25 percent increase in the population – immigrants who had not been allowed to own land or businesses in Russia. This great wave of immigrants brought to Israel a tremendous boost in engineering talent just as the tech sector began to take off, driven largely by military R&D. The incubator program was set up in 1991, in part to provide these skilled immigrants with the funding and know-how to become successful entrepreneurs.

At its peak in 1988, Israel invested 17% of GDP in the military. (Since 1988, that level has gradually declined to 5.6 percent – still among the highest in the world.) Just as NASA's massive investment in the 1960s generated benefits for a whole range of industries in the US, Israel's military investments helped to fuel the tech boom of the 1990s in medical devices, electronics, telecommunications, computer software, and hardware.

All non-Arab Israeli citizens spend two years in the military before college, many in advanced communications and security. Elite intelligence and cybersecurity units like 8100 and 8200 develop some of the best Israeli human resources.[5] What is the common denominator among companies such as Outbrain, Stylit, Nice, and Comverse? Their founders served in 8200, an Israeli Intelligence Corps unit responsible for collecting signal intelligence (SIGINT) and code decryption.

Many would-be entrepreneurs apply to the IDF's computer-training academy, known as Mamram. Located at a base outside Tel Aviv, it mimics a school for startups, teaching programming and project management to cadets in olive-green uniforms. Young hackers with proven skills get recruited by specialized intelligence units such as Matzov, the army's cybersecurity division, or units involved in signals intelligence and eavesdropping.[6] Waze's co-founder, Uri Levine, for example, got his start as a military software developer, working with big data and predictive analysis.

[5] https://aws.amazon.com/blogs/startups/the-israeli-recipe-and-no-it-isnt-for-hummus-this-time/
[6] https://thenextweb.com/insider/2015/07/07/5-reasons-behind-israels-startup-success/

“What happens in the military is we take these really bright young 18-year-olds and say: Here’s a data center the size of Google and Facebook combined. Go do something mission critical,” says Michael Eisenberg, a general partner at the venture capital firm Benchmark Capital. “Now they are spilling out of the army, and we have the highest and best concentration in Israel of big-data engineers and analysts anywhere in the world.”

Graduates of Unit 8200 have gone on to found a plethora of companies, including such names as:

ICQ	Leadspace
Checkpoint	EZchip
Imperva	Onavo
Incapsula	CyberArk
Cybereason	PrimeSense
Viber	FST Biometrics
NSO Group	Radware
Palo Alto Networks	Hyperwise Security
indeni	Adallom
NICE	Argus Cyber Security
AudioCodes	BioCatch
Gilat	CyActive
Waze	Wix
Intuition Robotics	SalesPredict
Indegy	Stylit
Outbrain	Converse

The list is illustrative, but far from complete. Unit 8200 is a problem-solving cauldron that intensively prepares high-talent individuals to attack very difficult problems with very meager resources. (With 5,000 or so people, 8200 has become a large-scale problem-solving organization.) Forbes estimates that Unit 8200 graduates have founded over 1,000 Israeli startups.

Yaron Carni, the founder of Maverick Ventures, a boutique venture capital firm, believes that, beyond its technical training, the military promotes a culture conducive to entrepreneurship. "One of the most unique traits of the IDF is that smart people get heard and promoted based on their skill sets. High ranking officers will consult with less senior soldiers if they value their expertise."

Paypal learned about this culture after it bought Israeli start-up FraudSciences in 2007, and Paypal president Scott Thompson went to Tel Aviv to meet with the FraudSciences team. "Every question was penetrating. I actually started to get nervous up there. I'd never before heard so many unconventional observations – one after the other. Junior employees had no inhibition about challenging how we had been doing things for years. I'd never seen this kind of completely unvarnished, unintimidated, and undistracted attitude. I found myself thinking, who works for whom here? Did we just buy FraudSciences, or did they buy us?"

TECHNION'S COMPUTER SCIENCE BUILDING

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The combination of Russian émigré engineers, military R&D and training, and a high number of engineering graduates in the 1990s and early 2000s (peaking at 3000 grads in 2005) was a combustive trifecta for the startup economy. "Most of the engineering talent comes out of the Israeli Defense Force – units like the 8200 – which specializes in information security," says Edouard Cukierman, managing partner of the Israel and Honk Kong-based Catalyst Investment Funds. "But there is a good amount of talent from Technion, the University of Tel Aviv, Hebrew University, and Ben Gurion University of the Negev."

By 2016, more than half of the Israeli companies traded on the NASDAQ were founded by graduates of Technion, the "MIT of Israel," and these companies accounted for 54% of the country's industrial

exports. In 2017, the Technion Research & Development Foundation partnered with China's UG Capital Management Ltd (UCG) to establish a $200 million venture capital fund to support Technion's efforts to commercialize its faculty's inventions.

Just south of Tel Aviv, you'll find the campus of the Weizmann Institute. With 2,000 faculty members and graduate students, it is organized into five faculties: biochemistry, biology, chemistry, mathematics and computer science, and physics.

Its mission is to pursue basic science, and to make fundamental discoveries. As a science research center, it is ranked #10 (Leiden Rankings) in the world (the first nine are all American, beginning with MIT and Harvard).

One can think of the Weizmann Institute as an Israeli "Bell Labs," but with an important difference. By law, Bell Labs had to license its technology to others, but that was not an urgent priority for that fabled institution. Bell Labs waited for applicants to come to it.

With a highly energetic technology-licensing department, the Weizmann Institute is proactively focused on getting great discoveries into the hands of entrepreneurs who can develop them into products and businesses. Its goal is to minimize the interval between discovery and commercial value added.

WEIZMANN INSTITUTE OF SCIENCE

Aerial View of the Campus

Source: By Amos Meron - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=23523722

A MATURING ECOSYSTEM

Like Silicon Valley clustered around Stanford and its many startups, Israel has an ecosystem primarily clustered around Tel Aviv and its universities. This vibrant startup/VC ecosystem, now in its third decade, is made up of local and international VC firms. Add to that around 300 multinational R&D operations in Israel, including Amazon, Apple, Google, Intel, Microsoft, Qualcomm, Samsung, and Facebook. Only the U.S. has more multinational companies R&D centers than Israel. Intel has over 10,000 employees in Israel, its largest employee group outside the US. Apple's R&D center in Herzliya is its largest outside of Cupertino. On a visit to Israel in 2015, CEO Tim Cook said, "Apple is in Israel because the engineering talent here is incredible."

The Israeli startup ecosystem is maturing. Valuations are higher, acquisitions and IPOs are more frequent. While the funding is growing, the number of deals is slowing down, indicating that the deals are bigger and more is going into late-stage companies. VC patience bodes well for startups, because it will give them a chance to develop their business and scale before they are bought out.

Two events, in particular, characterize the maturation of the Israeli ecosystem: Google's $1.1B acquisition of Waze in 2014, and Intel's $15.3B acquisition of Mobileye in 2017. The Waze acquisition had a psychological impact on the startup market, in two ways. One, it was a clear signal that a global giant like Google saw significant value in an Israeli startup. (A poll done six months after the Waze acquisition showed that 44.5 percent of Israelis of working age were interested in pursuing a career in high-tech, while only 26.1 percent said they would prefer to work in medicine.[7]) And, the deal pumped $1B into the ecosystem – or 25 percent of annual VC funding.

Two, it was a clear signal that if the founders hadn't been so diluted by early VC funding they might have held on to remain independent and scale before relinquishing control of the company. Since then, quick M&A deals have become less popular, as Israeli entrepreneurs aim to hold and build their companies. Micha Kaufman, CEO of Tel Aviv-based Fiverr, notes that: "Fiverr should be a multi-billion-dollar business. This is why we aren't looking to be acquired," he told Reuters. "Eventually, a company like ours will go public."[8]

[7] https://venturebeat.com/2017/02/11/israel-sees-record-vc-funding-shifts-from-quick-exits-to-long-term-growth/
[8] ibid

Source: https://www.slideshare.net/simonusiskin/mobile-monetisation-summit-december-2014

Since 2011, there's been a clear trend in Israel of a rising number of VC-backed companies that postpone a quick exit and advance towards higher valuations while maintaining control:[9] There were 16 IPOs in 2014, with an average valuation of $1.75B, compared with none in 2011. One of those IPOs was Mobileye, which went public on the NYSE several months after the Waze acquisition, and raised $890mm, at the time the largest Israeli IPO in the U.S. Mobileye was founded in 1999 with the aim of helping to lower vehicle injuries and fatalities, and it received an investment of $130 million from Goldman Sachs in 2007.

Fast-forward to Intel's 2017 megadeal to buy Mobileye for $15.3B. All the same takeaways hold as for the Waze deal: great psychological lift, affirmation of innovation by a global giant, and money flowing

[9] IVC (http://www.ivc-online.com)

into the ecosystem. But, the scale was exponentially larger. Instead of one-quarter of annual VC funding pumped into the ecosystem, this was 4x.

Prior to the Intel acquisition, the largest tech deal ever in Israel was the sale of NDS Group Ltd. to Cisco in 2012 for $5 billion, and before that the sale of Chromatis Networks to Lucent Technologies for $4.7 billion in 2001. As Lou Kerner, a Partner at Flight Ventures and manager of the Israeli Founders Syndicate, wrote immediately after the Mobileye deal: "Exits beget capital that comes back to the ecosystem and funds more startups. Exits create educated tech execs who have learned how to successfully grow tech companies. Exits create dreamers who believe they can build the next Mobileye. Exits incentivize governments to bring more resources, better regulations, and more a hospitable environment for the tech sector. Exits beget people outside the ecosystem (i.e. foreigners) to focus more on the seemingly thriving ecosystem. And the bigger the exit, and $15 billion is MASSIVE, the greater the impact, the greater the increase in velocity in the tech ecosystem virtuous circle."

Israel already had more VC investment per capita than any country in the world, but now with the blockbuster Mobileye deal, it has at least a *taste* of massive returns. It is blockbusters, after all, that make any ecosystem self-funding and self-sustaining.

CURRENT CHALLENGES

For all its successes as a "startup nation," the reality is that Israel's high-tech industries, which provide 50 percent of the exports, provide only 10 percent of the jobs. And the high salaries from the high-tech firms have not been matched by other industries. The high-tech industry employs slightly more than 8% of all workers. Average monthly salaries stand at some NIS 21,000 ($5,940) as opposed to outside the industry where average Israeli monthly wages are NIS 9,800 ($2,770).

There are other warning signs, as well. Israeli institutional investors generally eschew domestic VC funds. In 2016, with investment capital so hard to raise, Israeli VCs have been crowded out by foreign funds: Only 13% of all money invested in high-tech companies last year came from Israeli funds.[10] Moreover, domestic VC funds have not produced good returns in recent years. Among other things, none were invested in Mobileye, the biggest exit ever by an Israeli tech company.

[10] https://www.haaretz.com/israel-news/business/1.783439

Chinese investors have become a common sight in Israel in recent years, and now the Israeli government is leading groups of Israeli entrepreneurs on scouting trips to China. “China over the past two years has become the number one investor in Israel,” says Catalyst Investment Funds’ Cukierman. “For them, Israel is a great source of technology to help them develop their economy, while for us, it’s a fantastic opportunity to gain entry into the biggest market in the world.”

Israeli companies also face a sharp shortage of some 10,000 engineers and software programmers. Some firms may be forced to relocate abroad because of the shortage, states a recent report from the Israel Innovation Authority. (The new Chief Scientist is Aharon Aharon, former CEO of Apple Israel, who previously served in the IDF’s elite Intelligence Unit 8200 and has two degrees from the Technion, in computer and electrical engineering.)

Startups are hard pressed to match salaries offered by the big American tech firms, putting further pressure on supply. That has forced Israeli companies to search for talent in Eastern Europe and Ukraine, which has 20,000 graduates every year.

“If there is no dramatic increase in the number of employees in high-tech, Israel’s economy will reach a dead end and get stuck,” the report states. The agency is trying to double the number of Israeli hi-tech employees from its current 270,000 total to at least half a million.[11]

One back-to-the-future proposal is government funding of “coding boot camps.” Already, there are many private schools and institutes offering workers the chance to retool and learn computer code in order to become a software engineer. “Basically, if you’re in the middle of your career – in your late 30s and 40s – we’ll help pay for coding schools that do intensive training for six to nine months, and they’re quite popular these days,” states the Israel Innovation Authority. “We copied that model from the Israeli Army, where they do intensive training in intelligence units.”

[11] http://www.jpost.com/Business-and-Innovation/Israeli-hi-techs-face-shortage-of-thousands-of-engineers-and-programmers-506414

"There is a limit to the size of any industry a small country of only 8m people can sustain," The *Economist* notes in a recent article. "Until recently, the tech industry was helped by two trends: academics and employees of state-owned industries moving into the private sector and the arrival of tens of thousands of Jewish engineers emigrating from the former Soviet Union. Both these sources of fresh talent have now dried up. Israel's universities are producing fewer engineers, too: the share of graduates with science degrees is down from 12% in 1998 to 9% in 2014.[12]

THE ISRAELI FORMULA

Even if it's a bit off track right now, as it was after the dot-com boom and during the Great Recession, the Israeli startup ecosystem when it's humming has many elements in common with Silicon Valley: a robust supply of engineers, huge R&D facilities, active venture capital across all stages of development, good access to capital markets (especially NASDAQ), a cadre of successful entrepreneurs as mentors, and a global perspective.

The one piece of the ecosystem that is immature, at least compared to Silicon Valley, is business management, marketing, sales, and design. But, as more advanced business teams are brought to Israel by foreign multinationals to work with Israeli engineering teams, that is changing. As Uri Goldberg, an expert on Israel's high-tech ecosystem, said, "The vast majority of marketing and sales executives and general managers I know were trained at places like Google, Facebook, or Akamai. VCs want to be able to see that you have the best people – these U.S. brands represent quality."

A total of 83 companies have graduated from Microsoft Israel's eight accelerator programs, and have raised a total of $162 million, with three exits. In 2016, the companies chosen to join the program were relatively more mature – Microsoft called it the Scalerator program. The aim was to help them grow their businesses beyond just developing their technology and products – from a coaching program for CEOs to helping them enroll workers and customers and setting up a marketing and branding plan.

[12] https://www.economist.com/news/business/21701810-startup-nation-running-out-steam-talent-search

“In the beginning, we were all about technology, but today we are witnessing the rise of innovative companies such as Fiverr and Houzz,” says Shmulik Grizim, founder and CEO of Webydo. “The success of these companies means that Israelis have taken great leaps in marketing and branding as well.”

The Israeli formula is not quite the same as that of Silicon Valley or China. The components differ, the networks of talent emerge from different origins, the pressures are more immediate and intense, the bottlenecks are different, and some of the elements of the system have not yet fully matured.

But, the components mesh, they work well together, investment is robust and self-sustaining, and the system continues to evolve quickly to meet the needs of its society, and to play an increasingly important role in the global economy.

SIDEBAR

ISRAELI UNICORNS, ACTUAL AND ASPIRING

Israeli startup unicorns include marketing platforms Taboola and Outbrain, software delivery system IronSource, and app developer Como. Potential unicorns in the making include:

Zebra Medical Vision recently announced the development of a new software algorithm using machine and deep learning for detecting breast cancer.
Estimated valuation: $194 million

Sisence sells business intelligence and analytics software that helps companies make sense out of huge amounts of data, ranging from manufacturing efficiency to inventory and sales numbers to warranty use and return levels. Clients include Motorola, General Electric, Target, Lockheed Martin and a range of small and medium-sized businesses.
Estimated valuation: $650 million

Kaltura, an open-source video platform, enhances websites with customized video, and additional functionalities. Kaltura employs roughly 400 people in Israel and offices around the world, and received a $50m investment from Goldman Sachs in 2016.
Estimated valuation: $500 million

SimilarWeb is out to overtake Alexa as the most popular service for analyzing web traffic. Founded in 2007, the company provides websites and mobile-app publishers with statistics about their own traffic and that of competitors. Clients include Google, L'Oreal, AirBnb and eBay. Their team is spread across seven global offices with over 350 employees
Estimated valuation: $400 million

UNIT 8200

Unit 8200 is Israel's NSA, its cyber-security intelligence agency. It deals with signal intelligence, surveillance, decryption, and analysis of massive amounts of data. Its job is to anticipate, predict, prevent, and disrupt attacks. Its job is to save lives. It's in a very, very tough business. To do its work, it recruits the top 1% of graduating high school students.

8200 looks for students who are self-starters, who teach themselves, who don't need mentors. When they start work, they are given impossible problems, with meager resources, and no preconceived notions. For example, if other teams have failed to solve the problem, no one tells them so that they come at the problem from a new perspective. Where others have failed, they often succeed. Fresh eyes, different angle of attack, fresh point of view. For young, tough, energetic 18-year-olds, working at 8200 is like stepping into the filming of Mission Impossible, and living in that film for the next four years.

Every 18-year-old in Israel must serve in the Israel Defense Forces (IDF) – three years for men, two years for women, so 8200 has a recruiting advantage. But it doesn't wait for applicants to come to it. It starts scouting talent early – when students are 14 to 15 years old. It really wants to know who the very best students are. 8200 accepts applications, but it also sends out invitations – pretty insistent invitations.

8200 not only scouts; it develops. Magshimim is a program for 15- to 18-year-old high school students. It teaches computer skills, how to work in teams, how to manage projects.

It's tough to get into. 2,000 apply; 500 are accepted. It is seen as a feeder for 8200, but it's no guarantee. You have to perform to be invited. But, the flip side is that hundreds of graduates come into 8200 with a high level of preparation, ready to hit the ground running.

First step, though, is to pass the multi-layered entrance process. Online exam, psycho-social testing, testing of problem-solving skills, subject matter testing, personal interviews. Most of the interviewing is done by the younger members of the Unit. As one senior officer says: "They know what to look for. They look for people they would want on their teams."

Consequently, the criteria for admission are not just high smarts and high work ethic. These are essential, but far from enough. What else matters? Well, for starters, problem-solving gusto, working well with a team, imagination, out-of-the-box thinking, courage, tenacity, risk-taking (external and internal).

External Risk: When you have to take a risk to save lives. Internal Risk: When you have to tell supervisors what they don't necessarily want to hear, but what's critical to read the situation accurately, and to save lives.

With that combination of characteristics, it's little wonder that recruits are thrown into the heat of cyber battle on day one. It would be a big mistake, however, to think no training is involved, even if the training is unconventional. One example? Recruits are called into a room, and over a few hours are exposed to incoming slices of information. Short narratives of something that has happened, something that is happening. A few stories turn into dozens; sometimes over a hundred fragments of information are passed on to the team. The instructors observe and wait.

Suddenly, one of the team members shouts: "War is about to break out!" The instructors call a halt to the exercise, and explain the situation, the context from which the fragments of data emerged. War did break out. The question was: How soon could you have known?

It's a great simulation, especially since the signals, the facts, the fragments of data were real. How is it possible that 8200 would let such details of its training methods be revealed? It's probably important to understand that we're dealing with a situation of controlled distribution

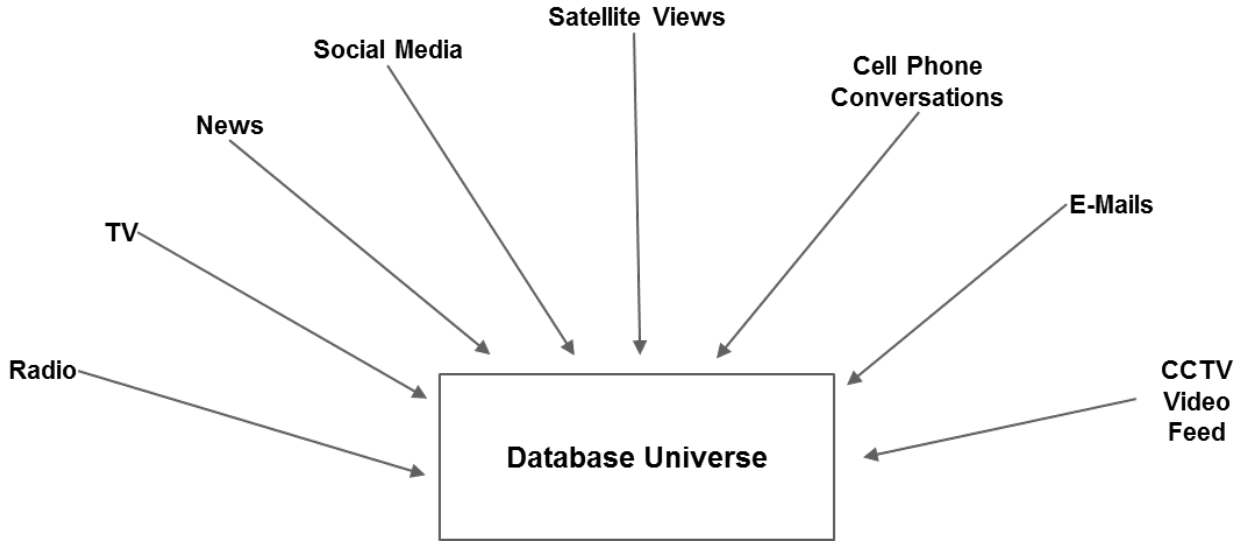
of information. Just as a famous CEO of a very successful company will tell journalists a great story, and will reveal two or three of the unique things his company does. He never, however, reveals the other eight or nine variables of his company's success equation.

Scouting, development (Magshimim), a diet of impossible problems, and meager resources, a special kind of training – all this produces an extraordinary warrior. And, as it turns out, an extraordinary business builder.

Cascade effects. Unit 8200 has some 5,000 people working in it. Every year, about 1,000 enter, and about 1,000 leave (after their four-year stint is done). What do the graduates do? They go to school (now well-prepared to extract the very most from their higher education), and they tend to build new, high-tech businesses.

During their four-year tour of duty at 8200, most soldiers work on 15 to 20 really tough projects, of which 3 or 4 might represent the seeds of a new business opportunity, typically in areas such as cybersecurity, big data, analytics. A disproportionate number of 8200 graduates go on to found or participate in the building of new businesses. There are approximately 5,000 high-tech companies in Israel. Forbes estimates that 1,000 were founded by alumni of 8200. With an alumni network of 17,000, there's a powerful new business-building force at work in the Israeli economy.

To understand the business-building potential of 8200 grads, it helps to know the nature of what they do.



Information is drawn from multiple sources into an expanding universe of data. From one point of view, this activity is haystack generation – vast volumes that make it even harder to find the golden needle. But then, team members write search programs, algorithms, and other search devices to extract precious, often predictive nuggets from this chaotic, growing universe. It's as difficult as 1, 2, 3:

1. **One** e-mail: Programs to find the one e-mail in a million that tells you of a planned attack.

2. **Two** phone calls: Programs to find patterns, such as a phone call placed every Thursday at 7:30am and 4:30pm.

3. **Three** views: In a process called fusion, to meld multiple views into a piece of priceless insight. Example: street-level photo of car, the cell phone conversation originating in the car, a satellite view of the car's pathway through the city.

What businesses can these skill sets relate to? Cybersecurity is the leading one (420 of Israel's 5,000 technology firms are cybersecurity companies); others include big data analysis, and

analytic companies of all varieties. Applications include manufacturing, sales force analyses, customer analyses, etc.

The depth, intensity, and precision of the signal decryption and analysis activity creates vectors into many domains of a modern economy. A partial list of companies formed by 8200 grads gives a sense of the breadth of economic yield this activity provides.

ICQ	Leadspace
Checkpoint	EZchip
Imperva	Onavo
Incapsula	CyberArk
Cybereason	PrimeSense
Viber	FST Biometrics
NSO Group	Radware
Palo Alto Networks	Hyperwise Security
indeni	Adallom
NICE	Argus Cyber Security
AudioCodes	BioCatch
Gilat	CyActive
Waze	Wix
Intuition Robotics	SalesPredict
Indegy	Stylit
Outbrain	Converse

The next phase in the evolution of that force is already evident. Nadav Zafrir, former head of 8200, retired in 2013. Within a year, he formed Team8, a venture capital firm plus incubator. His mission: to improve the success rate of startups in his country. How? Three factors are put to work to raise the odds of success: a syndicate of customers, management efficiency, and talent growth.

Team8 is radically more proactive in the venture process than conventional venture capital firms. With regard to point 1 (syndicate), it engages in deep, months-long conversations with its syndicate members – customers, investors, and such leading technology companies as Microsoft, EMC, Dell, Oracle, Cisco, and many others. The purpose of these extended discussions is to identify – with precision – the cybersecurity pain points these companies experience, to zero in on the biggest problems worth solving. "We might spend as much as 12 months working this issue to make certain we are working on the right, the most valuable problems. Then, we spring into action."

With respect to point 2 (management efficiency), Team8 creates conditions in which startups can share real estate, can share research and development, can share resources wherever possible. Reinventing the wheel is one mortal sin. Spending money unnecessarily is another.

With respect to point 3 (talent growth), Team8 is proactive in finding and recruiting great talent for its startups, not only among 8200 alumni, but amongst great university graduates who had worked at 8200. Its activity has grown to a level where it helps its startup companies by recruiting new talent at a rate of 8 new hires per month.

Zafrir also notes that the talent growth process is a bit different in Israel.

Consider what happens when an 18-year-old enters college. Disorientation, new friends, new courses, a lot of freedom, political debate, extracurricular activities, too much freedom,

searching for a major, a mission, a goal. How much of the potential four years of higher education is wasted, or not taken advantage of?

Compare that situation to that of a 22-year-old who has completed four years of intense, demanding, constantly challenging military service in Unit 8200. That young person approaches higher education with a few important characteristics:

- Leadership
- Maturity
- Sense of mission
- Ability to master complex new material quickly
- Ability to work in teams
- Critical thinking/independent thinking

Who will extract more value from four years of higher education? Is it any surprise that the 22-year-old 8200 alum could well extract three to five times more value than the untested and unhardened 18-year-old high school grad? And they can apply that richness of learning experiences to building teams and companies and industries.

When you consider this contrast, it's a bit of a shock. Rich, safe countries don't have to make sure that a high-quality, higher education is fully taken advantage of. For small, always at-risk countries, you can't afford to waste that precious resource. This system goes a long way toward making sure that this precious resource is fully mobilized.

If the US gets one unit of economic performance from a college education, Israel needs to get four to five units of performance. And it probably does.

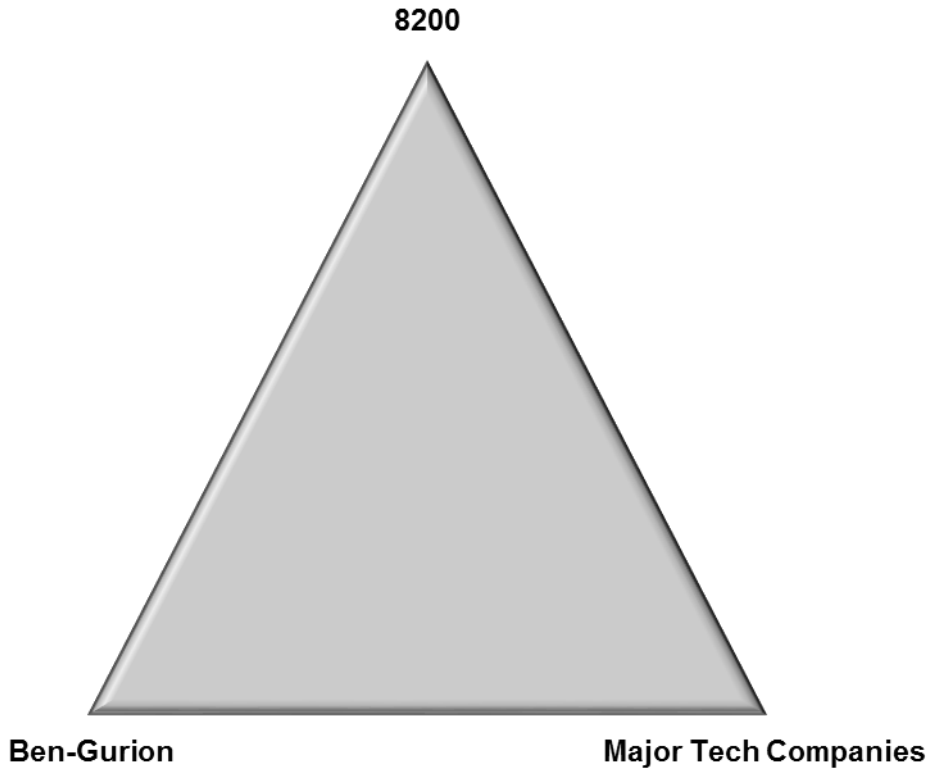
Even as Team8 is getting off the ground, two other developments in the evolution of the Israeli system are taking shape: EISP and the Negev Cyber Center.

In 2011, a group of 8200 alumni formed the EISP (Entrepreneurship and Innovation Support Program). 8200 alumni help to mentor and support new graduates in their business-building process. Many apply, few are chosen, but the selectees receive a lot of help from experienced 8200 graduates in getting their business off the launching pad.

In 2015, construction started on the Negev Cyber Park. The Park will be home to:

1. Ben-Gurion University
2. A lot of major high-tech firms (EMC, Microsoft, Oracle, Cisco, Deutsche Bank)
3. Unit 8200

The first tenants were the tech companies, quickly followed by Ben-Gurion. 8200 will move in this year. The already good links amongst academia, business, and 8200 will be strengthened, information exchange will be accelerated.



It's as if – in the US – you moved the NSA next to MIT or Stanford, next to a corporate campus that housed the likes of Amazon, Google, Apple, Netflix, Facebook, and others.

Quite a potent combination.

When you step back and take the long view, a single strategy (focus on finding, attracting, and developing the very best) has had an extraordinary long-term cascade effect:

1. 1,000 new businesses
2. An alumni force of 17,000
3. A new, sophisticated center for interaction (the Negev Cyber Center)
4. A systematic process (Team8) to keep improving the odds of success in the toughest economic activity in the world – getting startups to successfully scale-up.

* * * * *

- How good are we at attracting the best?
- How early do we start our process for scouting talent?
- How unique and how effective are our methods for training our talent?

* * * * *

EXTRA CREDIT

If I am not in the top 1% of my class, can I become a top one-percenter by:

1. Constant training (the Mongol "train every day" challenge)
2. Intensive reading (the Warren Buffett "500 pages a day" challenge)
3. Constant conversations with smarter people (Richard Brown of Eurostar talks to over 500 customers a year)
4. Fearless experimentation to get better (à la the Amazon alumni working at Providence Health)