Entrepreneurship & Tech Transfer In Israel

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Dean, The Davidson Faculty of Industrial Engineering & Management
The Technion – Israel Institute of Technology
Agenda

• The lay of the land
• History
• Facts
  – The human factor
  – Government support
  – Capital
  – International Comparison
• Summary – Why Israel?
• Entrepreneurship & Innovation at the Technion
Israel:
- 7M inhabitants
- GDP $162 bln
- GDP (PPP) $32k

Israel’s High-Tech Diamond

- 20+ incubators
- 2500+ start-ups
- 100+ VC/PE’s
- 70+ companies on Nasdaq
- Leading multinationals
- Matured Israeli high tech including service providers
- Office of Chief Scientist

Lay of the Land

University of Haifa
Technion
100 km
Bar-Ilan University
Tel-Aviv University
Weizmann Institute of Science
Ben-Gurion University
The Hebrew University of Jerusalem
Highlights in Israeli Innovation

✓ Pentium (Intel)
✓ Centrino (Intel)
✓ Telecom Billing (Amdocs)
✓ Call Center Logging (Nice/Verint)
✓ Voice Mail (Comverse)
✓ Instant Messaging (ICQ, Ubique)
✓ PC Board Inspection (Orbotech)
✓ VoIP (Vocaltec)
✓ Two-bit per cell Flash Memory (Saifun)
✓ Disk on Key (M-systems)
✓ Generic Drugs (Teva)
✓ Irrigation (Netafim)
✓ Stents (Medinol)
✓ Firewall (Checkpoint)
✓ SW Performance (Mercury Interactive)
✓ AntiVirus (Alladin, Commtouch…)
✓ Regeneration of Spinal Cord cells (Proneuron)
✓ Virtual Colonoscopy (Given Imaging)
✓ Minimal Invasive FUS (Insightec)
✓ 64 slice CT (Philips)
Israel - A Technology Powerhouse

- Experienced 2\textsuperscript{nd} time entrepreneurs
- University Students
- Foreign Technology Firms
- Availability of Technical People & Management Expertise
- Government Support
- Incubators
- Defense
- Corporate R&D
- Leading Academic Institutions & Research
- Seasoned VC Community
- Existing Technology Infrastructure
- Corporate Spin-Offs

Israel - A Technology Powerhouse

Lay of the Land
Israel Exports ($ millions)

Source: Economic & Planning, Ministry of Industry, Trade and Labor
### The Hi-Tech Growth in Israel

<table>
<thead>
<tr>
<th>History</th>
<th>New High-Tech Companies average per year</th>
<th>VC/PE raised in $10^6$ dollars average per year</th>
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<tbody>
<tr>
<td>From 1969-1992</td>
<td>7</td>
<td>7</td>
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<tr>
<td>From 1993-2005</td>
<td>307</td>
<td>1,214</td>
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Phases in Israel’s economic development 1948-1968

- Export mainly agriculture
- Building the science based capabilities:
  - Technion 1924
  - Hebrew University 1925
  - Weitzman Institute 1934
- Innovations and entrepreneurship in Agriculture (Kibbutz) and the Defense area
Phases in Israel’s economic development 1969-1992

- Arms embargo after six day war in 1967
- Building defense-industry-university complex
  - 65% of R&D defense related
  - Defense as % of GDP grew to 25% in 1980
  - Indigenous industry for planes, tanks, electronics warfare
- Spin-offs from defense e.g. Elscint, Scitex, Orbotech
- Multinationals entering Israel (e.g. Intel, Motorola)
- Due to historical labor-socialist tradition deep antagonism toward individual entrepreneurship
- Establishment of Office of Chief Scientist in 1968
Phases in Israel’s economic development 1993-2007

- 1993 tipping point for take-off high-tech sector
- High-tech, now already 34% of industry, drives growth
- Tech-entrepreneurs are the new heroes
Factors for Hi-Tech Growth in Israel (since the 90’s)

• The Human factor
• Availability of technology in defense sector and universities
• Government support (OCS, Yozma funds)
• Geo-political changes
  • Dramatic reduction of defense expenditure
  • Influx of US VC capital
  • R&D centers by global leading technology companies
• Cultural changes -- “legitimization” of individual entrepreneur as role model and fast adoption of US entrepreneurship culture
The Human Factor

• Double digit growth in engineering / science graduates
• Influx of Jewish scientists from the former USSR
• Annual inflow of 1,000 experienced engineers from ROTC-like programs of the IDF
• Shift in labor market following reduction in defense expenditures
Increasing Technology Transfer and Industry – Academia Interaction

The MAGNET Program in the Office of the Chief Scientist (OCS)

Goal: Enhance the development of the long term competitive edge of the Israeli Industry through clusters of companies and research institutes in areas which are important in the global markets
Capital Raised by Israeli Startups

Facts:

- Capital Raised by Israeli Companies
- Number of Companies

Source: IVC Research Center

<table>
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<tr>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>Q1-Q3/08</th>
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<tr>
<td>1,013</td>
<td>3,092</td>
<td>1,986</td>
<td>1,138</td>
<td>1,011</td>
<td>1,465</td>
<td>1,337</td>
<td>1,622</td>
<td>1,759</td>
<td>1,682</td>
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</tbody>
</table>

Capital Raised ($M):
- 1999: 338
- 2000: 513
- 2001: 538
- 2002: 352
- 2003: 371
- 2004: 428
- 2005: 378
- 2006: 402
- 2007: 462
- Q1-Q3/08: 374
Capital Raised by Sector
Capital Raised by Stage

Q1-Q3 2008
- Revenue Growth: 21%
- Initial Revenue: 38%
- R&D: 37%
- Seed: 4%

Q3 2008
- Revenue Growth: 14%
- Initial Revenue: 39%
- R&D: 44%
- Seed: 3%

Source: IVC Research Center
Scientists/Engineers per 10,000 working population

Percent with academic degrees (ages 25-64)

Source: the ministry of finance
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<th>Israel</th>
<th>Holland</th>
<th>USA</th>
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<tr>
<td>R&amp;D as % of GDP (ranking)</td>
<td>4.8% (1)</td>
<td>1.9%</td>
<td>3.0%</td>
</tr>
<tr>
<td>R&amp;D in $10^6 (ranking)</td>
<td>4,909 (20)</td>
<td>7,281 (13)</td>
<td>274,759 (1)</td>
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Source: IMD Competitiveness Yearbook 2004
## Today: The Second Silicon Valley

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<tr>
<td><strong>Silicon Valley</strong></td>
<td>855</td>
<td>$ 12.4 B</td>
</tr>
<tr>
<td><strong>Israel</strong></td>
<td>428</td>
<td>$ 1.4 B</td>
</tr>
<tr>
<td><strong>New England</strong></td>
<td>381</td>
<td>$ 2.8 B</td>
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</table>

Source: PriceWaterhouse Coopers, IVC,E&Y
Israel VC Investment Pace Mimics the US Int. comparison

Source: E&Y VentureOne

5/15/2009

Entrepreneuership & Tech Transfer in Israel

21
VC Fund Raising in Israel & Europe

Per capita VC funds raised (2000)
- Israel: $600 per capita
- Europe: $30 per capita (20x)

Source: IVC & VentureSource
Why Israel? It’s the Culture...

- Informality
- A community spirit
- Risk taking
- International networks and experience
- Everyone questions authority
- Non-hierarchical society
- Building startups has become the national sport, entrepreneurs - the new cultural heroes
Entrepreneurship & Innovation at the Technion
Entrepreneurship & Tech Transfer at the Technion

• Rationale

• Agents of entrepreneurship at the Technion
  – The Technion **Liaison Office** for Research Cooperation
  – The Technion Technology Transfer Office (**T³**)
  – The Bronica Entrepreneurship and Innovation Center (**BEIC**)
Entrepreneurship- Why at the Technion?

• The combination of science and engineering education and research

• A multidisciplinary research approach, programmed across faculties e.g. Nano Technology; Life Science and Engineering, Security Science and Technology, Technion Energy Program, Autonomous Systems program

• International research collaborations, e.g. 7 EU FP7 programs, second after University of Cambridge

• An entrepreneurial approach to the transfer of knowledge and technology
Pathways of knowledge and technology transfer (TT)

- Teaching of students (more than 80% of TT). Technion graduates have leading positions in 90 of 100 leading companies in Israel.
- TT through employment by incumbent companies or start-ups by Technion alumni.
- Patenting of technology and transfer through licensing and spin-offs.
- Publications of research in public domain.
- Joint research, e.g. FP7, Magnets and Magnetons. Joint IP Contract research with TT to research contractor.
- Consultancy by Technion faculty.
Promotion of Collaborative International R&D projects

Enhancing cooperation with industrial and other strategic partners

Early stage project management

Crisis management in ongoing projects

Reciprocal mapping of technological ideas at the campus

Searching for new fields of activities and services

Assisting technology transfer (pre-competitive stage of technology transfer)
Technion Technology Transfer (T³) Office

Licensing

Spin off Companies

- Subsidiary Companies
- Dimotech Ltd.
- Technion Seed

IP
- Patent Disclosure
- Patent Registration
- Patent Maintenance

t3.technion.ac.il
Number of License Agreements 2002-2008
Number of Companies established 2003-2007

*Including: TRDF/DIMOTECH/ TEIC Companies based on Technion IP but excluding equity holdings in companies not established by TRDF*
Main goals:

• Become the focal point for the development of campus wide entrepreneurial activities, for students, faculty, staff and alumni

• Work in partnership with the Technion Research & Development Foundation to identify promising technologies and assist in commercialization

• Strengthen university and industry relations through joint research and action learning
BEIC: Three Pronged Mission

• **Outreach**: providing direct consultation for budding entrepreneurs, including ongoing mentoring, connections to external resources, organizing networking events and more

• **Teaching**: support, organize and teach entrepreneurship, using an action learning approach, both inside and outside of the classroom

• **Research**: understanding of innovation and technology entrepreneurship and its contribution to economic growth. Close cooperation with Samuel Neaman Institute
• Budding entrepreneurs are mentored and helped along every step in the process of launching their startup

• In the past semester over 25 startups have received free advisory

• “Unilims” (MBA students): “…due to the ongoing assistance we managed to develop the full marketing and business plan… We realized that the hypothetic idea we had been working on for almost six months, had already grown up to a real potential that could seriously become a startup company in a near future…”
The Entrepreneurship Club (E Club)

- A student organization committed to fostering thinking and discussion on entrepreneurship
- The E club meets every two weeks and provides the students a place to meet fellow young entrepreneurs and learn from one another
- The club invites speakers from industry to give educational talks
- The club includes over 400 students from all faculties (both undergraduates and graduates)
Start-Ups generated by E-Club Members

- a personalized music aggregator, for convenient listening to music with any media player on any platform. Lately acquired by Yahoo!

- Offering a complete solution for content and advertising, with contextual, dynamic adverts, embedded in the mobile content

- Record visitors' every action as they browse a website to understand visitor behavior and improve website's usability.

- a search engine tool that allow users to search for information created and referenced by their own social graph
The Annual BPlan Competition:

• The first Israeli student-led entrepreneurship contest, running for the 5th year with great success

• BizTEC created 7 funded companies

• BEIC supports BizTEC both logistically and with content (Academic director, workshop planning, judges etc)

• BEIC provides follow-up and guidance to all BizTEC participants

• More details at: [www.biztec.org.il](http://www.biztec.org.il)
Entrepreneurship & Tech Transfer in Israel

IDEAS
Submit a short paper describing your IDEA. Get feedback and win prizes.

Executive Summary
Submit an Executive Summary for your venture. Winners will receive mentors to assist in preparing the Business Plan.

Business Plans:
Submit full Business Plan. Winners receive cash prizes to support venture launch, vast media exposure and a ticket to International Competitions.

Dec 7th BizTEC09 Kick-off
Dec 14th Workshop I
Jan 4th Workshop II
Jan 11th Workshop III
Jan 25th Workshop IV
Mar 4th ES submission
Mar 25th Semi-Finals
April 19th Workshop V
May 17th BP submission
June 11th Finals

IDEA submission Dec 30th
Executive Summary
Business Plans:
BP submission May 17th

Entrepreneurship & Tech Transfer in Israel
• Offering promising student-entrepreneurs the opportunity to mature their idea and be exposed to business network

• Directing and financing faculty and grads in final research stage towards commercial end

• Providing a workroom with flexible workplaces, computers, wireless internet and more for teams working on new ventures

• Providing resources to perform market research and develop business plans, including mentors and initial funding ($5000)
• Entrepreneurial support for Technion alumni
• Chief executives from Technion’s “Club 100” become mentors to budding entrepreneurs
• over 35 start-ups in 3 years of activity;
• High success rate: 70% of companies raised money / achieved sales / performed exit
A Hebrew website offers a wealth of practical knowledge:

- Learn about the “entrepreneurial path” (how to write a BP, how to raise money, how to open a company…) through summarized information, samples and important links
- Information on the different activities, seminars and courses on campus
- Social network for Technion entrepreneurs
- Success stories and more
BEIC offers entrepreneurial education in a systematic fashion by broadening the scope and increasing the number of entrepreneurship courses. Some examples:

- **From Patent to First Investment**: teams composed of graduates and MBA students develop business plans for patent invented by Technion researchers. As a result of the first two courses, two startups received an investment.

- **Entrepreneurship and Intellectual Property**: intended for undergrads and grads from across the Technion, the course aim is to provide knowledge and tools on how to start a technology venture and how to create and protect IP.
“From Research to Start-Up”

- A series of 6 seminars and workshops for Technion graduate students and faculty
- The goal is to provide an initial tool box on how to turn a research into a viable business and to increase awareness for the importance of technology transfer within the Technion
- Cooperation between the Graduate Student Organization, the Business Development Unit and the Center
Cross-Disciplinary Research

- Support research of 4 faculty members in entrepreneurship, innovation and strategic management and their interactions
- Currently six graduate students are involved in action research and “clinical research” projects
- Research subjects include: technology transfer in universities, team characteristics and the entrepreneurial process, opportunity recognition, and entrepreneurial education
### Pre-Seed Program Details

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<tr>
<th>Pre-Seed</th>
<th>Competitive R&amp;D</th>
<th>Generic R&amp;D</th>
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<tr>
<td><strong>Incubators</strong>&lt;br&gt;Provides a framework and support for nascent companies to develop their innovative technological ideas and form new business ventures that can attract private investors. The program is open to private investors to become owners of the incubators and to invest in the nascent companies at an earlier stage, thus enabling a greater return on investment. Grants are up to 85% of the approved expenses. Budget: approximately $30 M/yr.&lt;br&gt;<a href="http://www.incubators.org.il">www.incubators.org.il</a></td>
<td><strong>R&amp;D Fund</strong>&lt;br&gt;Supports industrial competitive R&amp;D projects. Grants are on a sliding scale from 20%-50% of R&amp;D budget. Royalty payment is 3%-5% of future product sales. Budget: approximately $300 M/yr. Supports over 1000 projects /yr from more than 500 companies.&lt;br&gt;<a href="http://www.moit.gov.il/madan.htm">www.moit.gov.il/madan.htm</a></td>
<td><strong>Magnet</strong>&lt;br&gt;Supports the formation of consortia comprised of industrial firms and academic institutions in order to jointly develop generic, pre competitive technologies. Grants are up to 66% of the approved budget. No royalty payments. Budget: approximately $60 M/yr.&lt;br&gt;<a href="http://www.consortia.org.il">www.consortia.org.il</a></td>
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<td><strong>Tnufa</strong>&lt;br&gt;Designed to encourage and support an individual entrepreneur in his initial efforts to build a prototype, register a patent, design a business plan etc. Grants are up to 85% of the approved expenses.&lt;br&gt;<a href="http://www.tnufa.org.il">www.tnufa.org.il</a></td>
<td><strong>Mini - Magnet</strong>&lt;br&gt;Promotes technology transfer from academic institutions to Industry via mutual cooperation between one company and one academic research program. Grants are up to 66% of the approved budget. No royalty payments.&lt;br&gt;<a href="http://www.consortia.org.il">www.consortia.org.il</a></td>
<td><strong>Generic R&amp;D</strong>&lt;br&gt;Encourages companies that invest heavily in R&amp;D to invest a larger portion of it in Generic Long term R&amp;D. Grants are up to 50% of the approved budget. No royalty payments.&lt;br&gt;<a href="http://www.moit.gov.il/madan.htm">www.moit.gov.il/madan.htm</a></td>
</tr>
<tr>
<td><strong>Noffar</strong>&lt;br&gt;Designed to support applied academic research in biotechnology in order to promote the transfer of the technology to Industry. Grants are up to 90% of the approved expenses. No royalty payments.&lt;br&gt;<a href="http://www.consortia.org.il">www.consortia.org.il</a></td>
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# Seed Program Details

## Pre-Seed

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<th>Program</th>
<th>Details</th>
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<tr>
<td><strong>Heznek</strong></td>
<td>Designed to encourage investments and increase the number of new startup companies. The government and the investor will invest matching funds in a seed company. Grants are up to 50% of the approved work program. The investor will be given an option to purchase the government shares. <a href="http://www.moit.gov.il/heznek.htm">www.moit.gov.il/heznek.htm</a></td>
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## Competitive R&D

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<th>Program</th>
<th>Details</th>
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<tr>
<td><strong>Bi-National Funds</strong></td>
<td>Enables participation in a joint R&amp;D program with a foreign counterpart. Grants are up to 50% of R&amp;D expenses of each company from each state. BIRD: IL - USA CIRDF: IL - Canada SIIRD: IL - Singapore BRITECH: IL - Britain KORIL: IL - Korea</td>
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## Generic R&D

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<th>Program</th>
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<td><strong>Europe's R&amp;D Framework Agreement - ISERD</strong></td>
<td>Gives an opportunity for Israeli companies and research organizations engaged in R&amp;D to participate in jointly implemented programs with European counterparts and thus become better integrated into European business and science communities. Grants are up to 50% of the budget without limits. No royalty payments. <a href="http://www.iserd.org.il">www.iserd.org.il</a></td>
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## Partnering Services

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<th>Program</th>
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<tr>
<td><strong>Matimop</strong></td>
<td>Promotes and assists participation of Israeli companies in international bilateral or multilateral cooperation programs for industrial R&amp;D. Promotes joint industrial development of advanced technologies. Keeps a constantly updated database of projects in diverse advanced technologies and also a database of profiles of Israeli technological companies seeking international cooperation. <a href="http://www.matimop.org.il">www.matimop.org.il</a></td>
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## Eureka

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<th>Program</th>
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<tr>
<td>**Europe-wide network promoting collaborative market-driven R&amp;D projects in most fields of advanced civilian technology. The project enjoys access to sources of national funding - Israeli companies taking part in the program are entitled to receive R&amp;D grants from the OCS. <a href="http://www.matimop.org.il">www.matimop.org.il</a></td>
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## Bi-Lateral R&D programs

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<th>Program</th>
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<tr>
<td><strong>R&amp;D agreements with numerous countries</strong></td>
<td>The project enjoys access to sources of national funding. Israeli companies taking part in the program are entitled to receive R&amp;D grants from the OCS. <a href="http://www.moit.gov.il/madan.htm">www.moit.gov.il/madan.htm</a></td>
</tr>
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