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Communications in Israel

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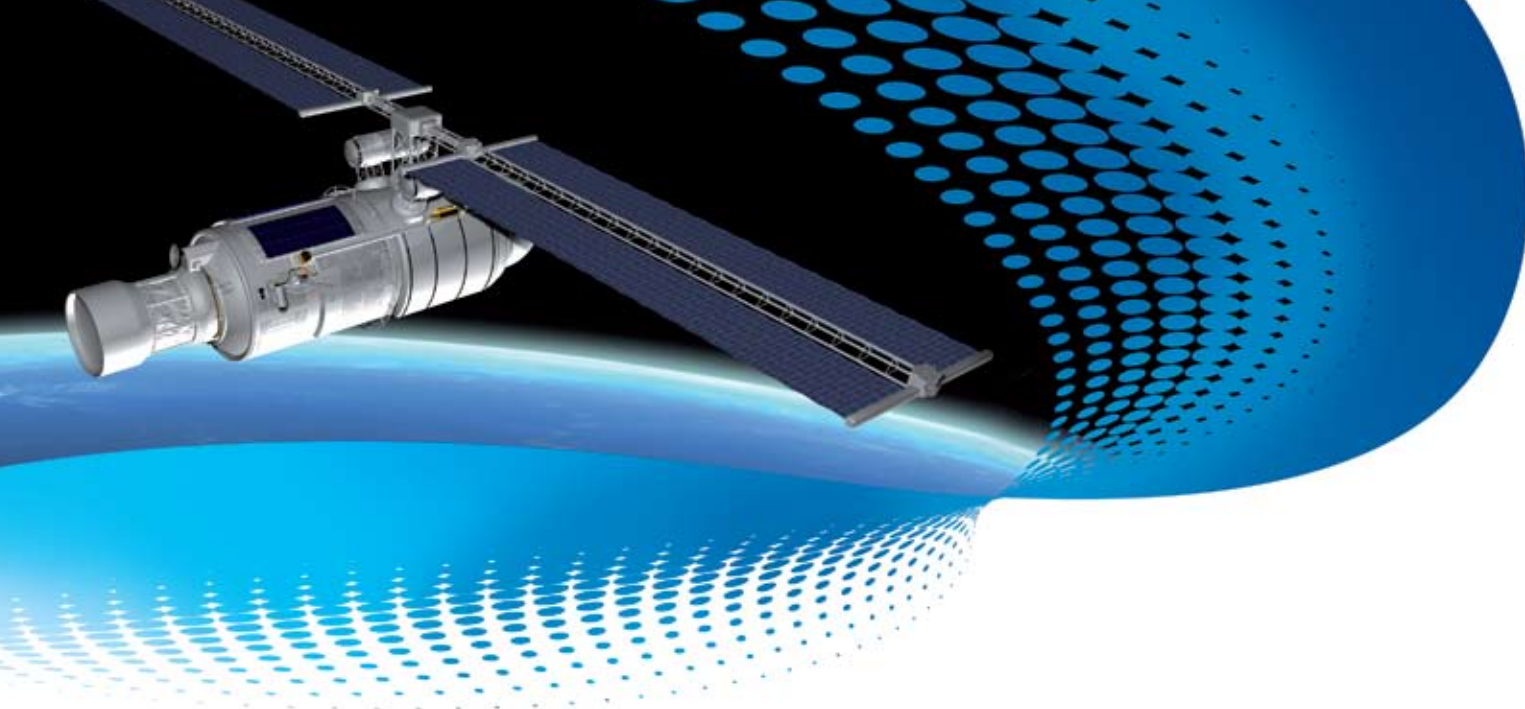


Table of Contents

| | |
|---|----|
| Israel - Home of Innovative Communication Technologies..... | 3 |
| A History of Firsts - Pioneering Israeli Communication Technologies | 8 |
| Noted achievements by some of Israel's finest and youngest companies | 9 |
| The World Invests in Israeli Communication Technology | 10 |
| Israeli Communications - The Bigger Picture | 12 |
| Government Support | 15 |



Israel - Home of Innovative Communication Technologies

Life Changing Breakthroughs

Israeli companies have traditionally played an active part in revolutionizing the global Communications industry. Over the years, companies like VocalTec, Comverse, NDS and others have introduced innovations that have changed the face of global communications - Voice over IP, Voice Mail, Conditional Access, Instant Messaging and Mobile WiMAX are all attributed to Israeli research and development.

Thriving Entrepreneurship

Israel's 60 years of research and innovation in civilian and military applications have resulted in the emergence of several world-renowned communications power-houses, sprouting hundreds of smaller companies and thousands of startups. Of the approximately 6,000 Israeli start-up companies operating in 2008, 20% were in the communications sectors.

Breeding Global Success

Israel has been on the cutting edge of research and development in advanced technologies for many years. Israel's scientists and engineers have been constantly confronted with the challenge of quickly devising new and innovative solutions and turning them from concept to product in the shortest time feasible. Over the past two decades, Israel's R&D excellence has spilled over from the academic centers and the military sphere and has turned Israel into a high-tech economy.

Israel's communications track record of cultivating start-ups capable of expanding into global communications leaders and its specialty in communication infrastructure and digital networking has fostered pioneering companies such as ECI Telecom, Alvarion, NICE, RADVision and many others, now developing leading solutions for the next generation of communication networks. The communication software sector is also thriving, piloted by companies such as Amdocs and NICE (with aggregate revenues of \$4 billion in 2008).

International Interest

Israel's communications sector is recognized as the world's second most important communication cluster after the Silicon Valley in the US.

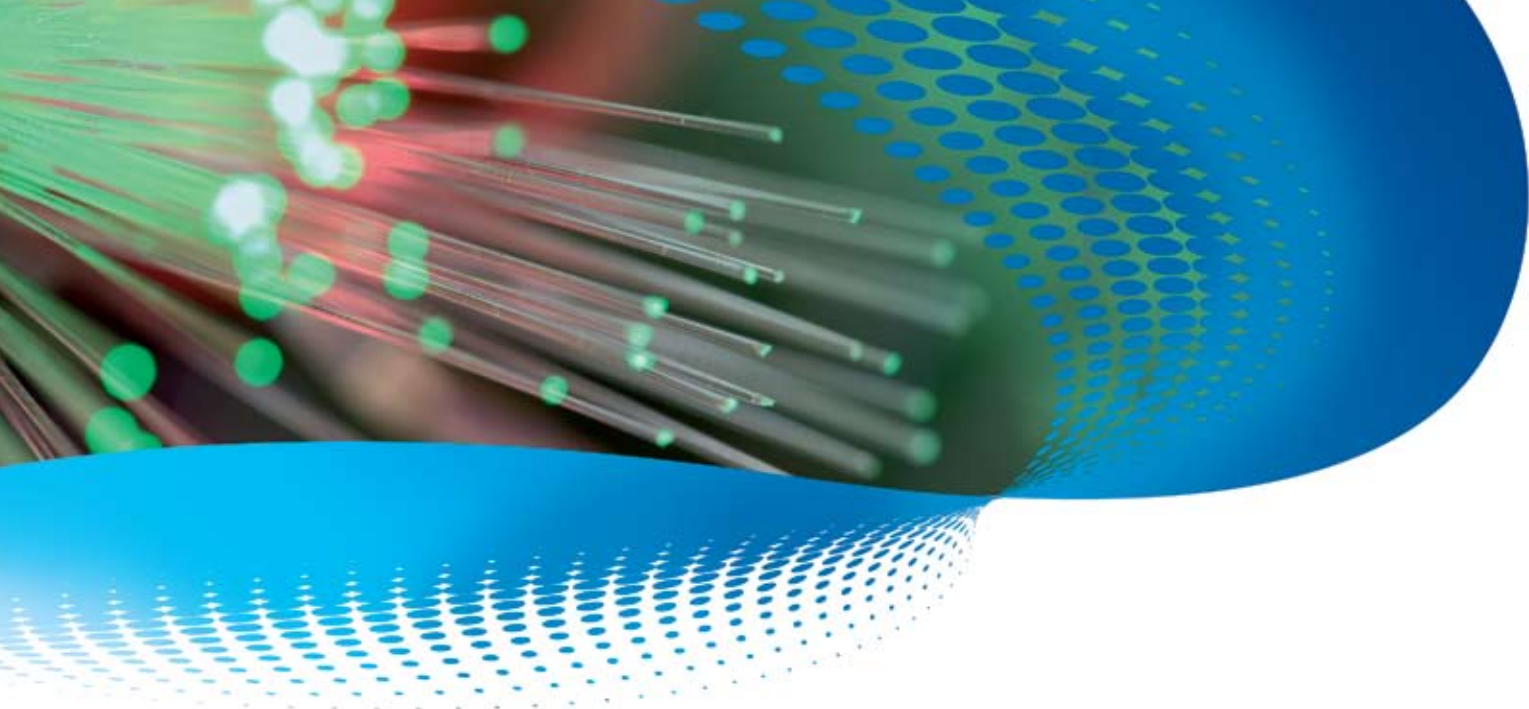
With multinational technology companies such as Cisco, IBM, HP, Intel, Microsoft and Google investing heavily in R&D activity in Israel, and with the number of start-ups constantly increasing, the country serves as a powerful source for profit-driven innovation.

Israel's ICT Sector - facts and figures

- ICT accounted for 16% of Israel's GDP in 2008
- ICT exports were 26% of total goods and services exports in 2008
- 6.5% of Israel's workforce in 2008 was employed in the ICT sector

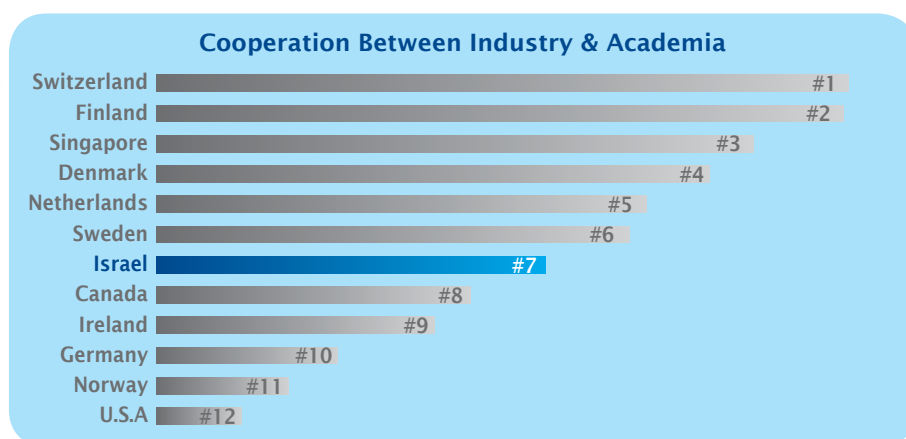
“There is a greater concentration of talented hi-tech manpower here in comparison to other countries, almost to the extent of Silicon Valley”

Bill Gates,
Microsoft Chairman



Cluster-power

What has attracted these companies to Israel is not only the high concentration of a technically trained and entrepreneurial workforce, but also the fact that clustered in a small geographical area (over 90% of the population is within two hours driving time of each other) there exist seven major universities and their research activities which help drive the industry through constant innovation. The government's support program for R&D development coupled with groupings that emanate from shared military experiences developing new technologies, combine to create an atmosphere of creativity unequalled worldwide.



Knowledge Transfer (Universities - Industry)

Source: IMD World Competitiveness Yearbook 2009

Communications Sectors

Israel's Communications industry is rich and diverse. From Communication Equipment to Mobile Software and Internet applications, Israel is home to global leaders and cutting-edge startups.

Communication Equipment

Routers, Switches, Optical Components and Networking gear developed in Israel are part of almost every network in the world - from the core of the network to the network edge and even in the home, as part of Consumer-Premise Equipment - with veteran companies like Telrad, ECI and RAD alongside startups like Ethos, Axerra, Actelis and many others. In recent years, Israel has emerged as a center of excellence in wireless networks, with significant developments around fixed and mobile WiMAX, Adaptive Array Antennas and more, developed by industry leaders like Alvarion and Ceragon Networks and startups like, Dekolink and Pallasium.

- 108 communication companies raised \$516 million in 2008

Communication Software

Communication Software has been a core growth engine for the Israeli industry, with innovation spillover from large companies such as Comverse and Amdocs to a multitude of smaller companies and startups. The Billing and Customer Management segment has enjoyed the spillover effect, with companies such as MIND, MaxBill, FTS and startups like Trivnet and AllCharge reaping the benefits. Emerging segments like Service Adoption Management and Marketing Delivery Platforms were conceived in Israel by Olista, Pontis and others.

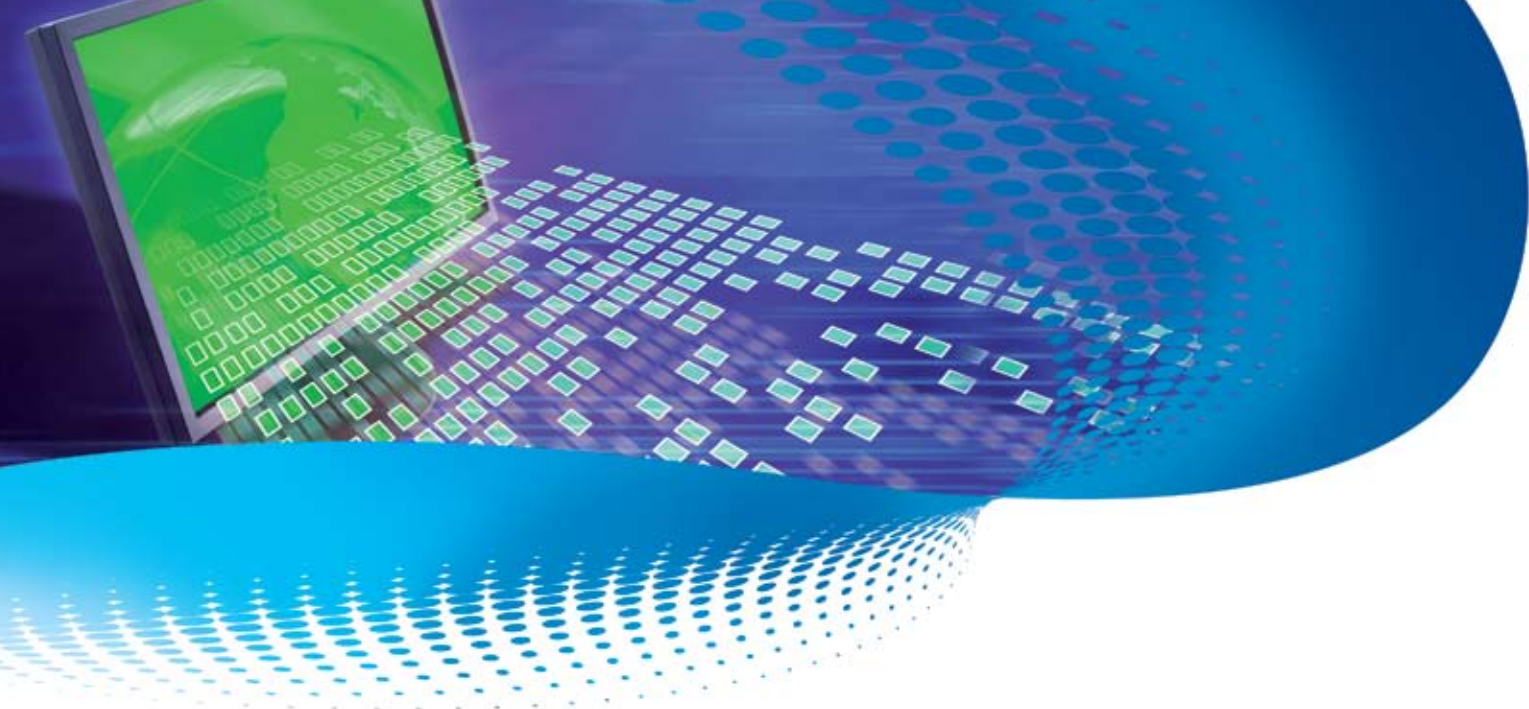
- 45% of VC funding went to communication and software in 2008

Cable, IPTV and Content Delivery

With companies like Harmonic, Scopus and BigBand, Israeli technology has dominated cable and IPTV deployments worldwide. IPTV solutions from Bitband, Orca Interactive, NDS and many others have served as building blocks for this nascent market. Recently, startups like Arootz, Imagine, Rayv, Contextream and more have positioned themselves to revolutionize video delivery over the Internet.

Mobile Applications and Mobile Content

From the early days of mobile telephony, Israeli companies have developed end-user applications leveraging all available mobile standards, from SMS and WAP to 3G Video and UMA. Client-side applications enhancing the communication experience, like Axis Mobile's push email, Silent Communications' next-gen call completion and Zlango's icon messaging; Client-server solutions like Celltick's idle screen applications, Flash Networks' mobile data optimization and acceleration, and Bamboo's media casting; and server-based applications such as Tjat's Mobile IM and SendM's multi-SMS.



Israel is home to highly innovative mobile content creators - PixelPlay (acquired by Oberon Media), Vringo and Logia, to name a few, alongside intelligent content adaptation solutions from companies like Jumptap, Infogin, Vollee and HooQs. Content management is also a sweet spot of Israeli technology, with giants like Comverse and Amdocs paving the way for the likes of Mobilitec (acquired by Alcatel-Lucent) and Unipier, developing advanced content delivery and policy management solutions for network operators.

Components

Israel is the source of some of the biggest innovations in communication components. Handheld components enabling wireless communications, positioning, mobile TV, security and more from companies such as Zoran, Altair, ModemArt (acquired by Agere), Butterfly (acquired by Texas Instruments), Wisair, Envara (acquired by Intel) and Asocs; Network processors and transceivers from companies like TeraOp, Broadlight, Passave (acquired by PMC Sierra), Siverge, Octalica (acquired by Broadcom) and Colorchip; Home Networking components developed by Amimon, Celeno, Coppergate, Metalink, Valens as well as others; and core network processors from Wintegra, DesignArt, Dune and many others. Israel's unique expertise in optical technologies has resulted in the emergence of an unprecedented number of companies developing optical components for handhelds. Advasense, Dblur, Eyesquad (acquired by Tessera), Explay, EyeSight and Lumio are only a few examples.

Internet Telephony and Messaging

From the early days of Instant Messaging, pioneered in Israel by Mirabilis (ICQ), Israel has been home to numerous successes in Internet messaging, voice and video solutions. Israel is the unofficial capital of the Telco 2.0 revolution, at the intersection between Web 2.0 and telecommunications, with startups like Fring, Jajah, iSkoot, and Pudding. Israel is also home to world-leading Mobile Instant Messaging solutions from companies like Followap (acquired by NeuStar in 2006), Comverse and IXI Mobile.

Communication Security

Security is one of Israel's noted strengths, with years of academic and practical research in both civilian and military frameworks. Israel's communications industry has enjoyed the wealth of security expertise in various ways. Israel is a global leader in call monitoring and recording solutions for lawful interception and contact centers, with constant innovators NICE and Verint. Revenue Assurance is another area of excellence for Israeli companies, such as cVidya and ECTel. Handset security solutions, defending users from malware and protecting content from illegal distribution, are developed in Israel by Finjan, Discretix, M-Systems (acquired by SanDisk), Emblaze and others. Network security and personal communication security have also leveraged the deep networking security expertise in Israel: Firewall and VPN technology has turned Checkpoint into a world leader in networking security and a pioneer in the Internet firewall space, with a market cap of \$7.2 billion in 2009.

- 67 internet companies received \$284 million in 2008.
- Microsoft has chartered its new Israeli R&D center in Herzeliya with the development of mobile messaging technologies for its Windows Live suite.

“There is a direct Israeli influence on IP Communication... All this technology comes out of Israel - but I don't think people have realized this... if it's going to happen, it'll happen here (in Israel) first”

Jeff Pulver,
PulverMedia, American VoIP industry guru





A History of Firsts - Pioneering Israeli Communication Technologies

- **Comverse** was the first company to integrate voice, fax, and call processing functions into a single system, back in 1986. Today Comverse leads the multimedia messaging market.
- **NICE Systems:** With years of expertise in voice recording and analysis, NICE was the first company to enter the voice over internet protocol (VoIP) market with a VoIP recording technology. NICE has leveraged years of applied research to become the world leader in multimedia digital recording solutions for business interaction management and security.
- **Runcom:** As a pioneer of Orthogonal Frequency Division Multiple Access (OFDMA) technology, the heart of 4G, both in LTE & WiMAX, Runcom was the first company in the world to introduce a Mobile WiMAX compliant ASIC.
- **RADVision** was the first to develop the H.323 Protocol, the core standard of VoIP that enables voice, picture and data to be transmitted via the Internet. It has become a world leader in technology for video conferencing and multimedia over IP.
- **Mirabilis** was the first company to introduce a consumer product for instant communication and chat, ICQ. Mirabilis was acquired by AOL in 1998.
- **VocalTec** was the first company to successfully commercialize VoIP technology, with its 1995 release of the Internet Phone.
- **ECI Telecom** first gained world prominence by introducing the concept of toll-quality international traffic compression, and the first to enable two calls on the same phone line. ECI was also the first company to deploy HDSL, and the first to deploy a Fiber-to-the-Home Passive Optical Network (FTTH PON) in Europe.



- **MRV** was first to develop remote access, first with 10/100 dual-speed LAN switches and first to deploy Wavelength Division Multiplexing (WDM) technology in residential access networks. MRV has grown to become an international leader in Ethernet fiber core networks solutions.
- **Comsys** was the first company in the world to offer baseband IP for EDGE solutions, both for handsets and for base-stations. Comsys is now a leader on 4G chipsets for the next generation cellular infrastructure, including Mobile WiMAX, UMTS, EGPRS (EDGE), GPRS and GSM networks.

Noted achievements by some of Israel's finest and youngest companies

- **Altair** - Ultra low power mobile WiMAX silicon. Lowest power mobile WiMAX chipset in the world.
- **iSkoot** - Mobile VoIP solutions. The first Mobile Skype phone, launched in 2007 by the Hutchison 3 group.
- **Massive Impact** - Advanced Customer Discovery solutions for communication providers. The first mobile customer discovery platform to be commercially deployed.
- **Siano Mobile** - Silicon receivers for the mobile digital TV market. The first multi-standard receiver for mobile digital TV and digital cable applications.
- **Modu** - Modular personal communication solutions. The world's smallest stand-alone communication device.

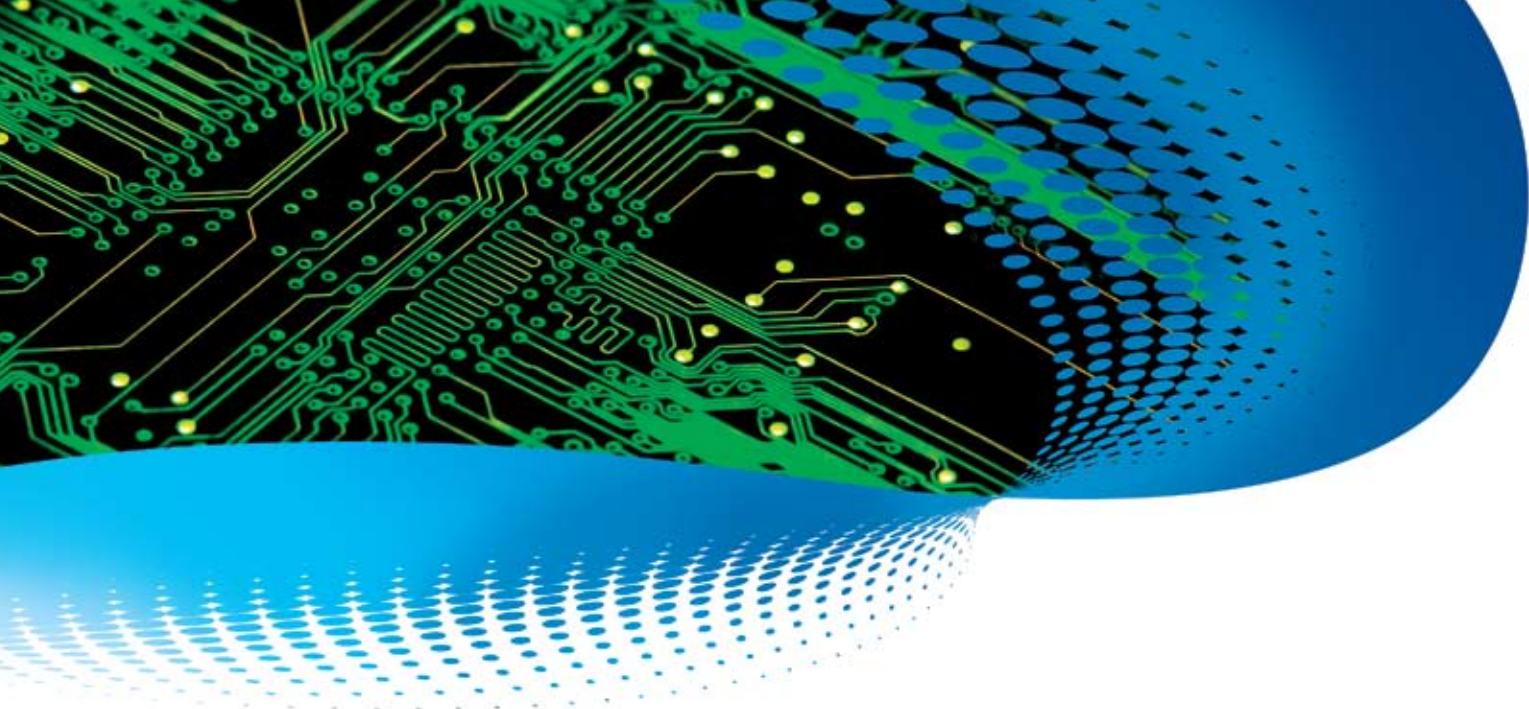
2007 Deloitte Technology Fast 500 EMEA ranking

| Rank | Company Name | Business Type | Growth | Location |
|------|-----------------------|---------------------------|---------|----------|
| 1 | Voltaire Ltd. | Communications/Networking | 50,612% | Israel |
| 2 | Celltick Technologies | Communications/Networking | 29,627% | Israel |
| 3 | Runcom Technologies | Semiconductor/equipment | 27,950% | Israel |
| 6 | Red Bend | Software | 14,347% | Israel |

- Voltaire develops and markets software and switching network infrastructure products for storage and server systems.
- Celltick develops and markets software intended to increase average revenues per cellular user.
- Runcom develops semiconductors for the WiMax industry.
- Red Bend develops Mobile Software and Firmware Over-the-Air update.

“Most solutions to most IT problems will come from Israel”

Gordon Graylish,
Vice President & General Manager, Intel (Europe, Middle East & Africa),



The World Invests in Israeli Communication Technology

“Israel is an incredible opportunity for us. It provides a growth engine for innovation”

Richard Nottenburg,
Motorola's Executive
VP & CTO

Israeli Technology - A Deal Maker

Israeli technology companies continue to be acquisition targets for large multinationals, a trend which has accelerated over the past few years.

The following table lists some notable telecom M&A transactions in the years 2006-2009:

| Israeli Company | Acquirer | Deal Size | Date |
|-----------------------|---------------------------------|-----------|------|
| Marvell Semiconductor | DSPC (Intel) | \$600M | 2006 |
| PMC Sierra | Passave | \$300M | 2006 |
| Microsemi Corp | PowerDsine | \$245M | 2006 |
| Telefonica O2 UK Ltd | Jajah Technologies Ltd | \$207M | 2009 |
| Motorola | Terayon | \$180M | 2007 |
| NeuStar | Followap | \$140M | 2006 |
| AT&T | Interwise | \$121M | 2007 |
| Harmonic | Scopus Video | \$86M | 2008 |
| Microfocus | Netmanage | \$73.3M | 2008 |
| Oclaro Inc | Xtellus Ltd | \$33M | 2009 |
| Padtec SA | Civcom Ltd | \$35M | 2008 |
| Software AG | Jacada | \$26M | 2007 |
| Viaccess | Orca Interactive | \$21.4M | 2008 |
| Elbit Systems Ltd | Shiron Satellite Communications | \$16M | 2009 |
| RuggedCom Inc | WiNetworks Ltd | \$14M | 2009 |



Vote of Confidence by Global Giants

Israel's technology excellence has attracted the world's leading technology companies. Identifying Israel as a source of innovation and high skills in research and development, around 120 foreign high-tech companies have started Israeli R&D operations.

Several of the above mentioned acquisitions have lead to the establishment of new R&D centers. **Alcatel-Lucent, AT&T, Juniper Networks, Agere Networks and PMC Sierra** are among the global players who have leveraged their acquisitions to start a full-fledged R&D operation in Israel. For other multinationals, the recent acquisitions have reinforced their existing activities: Cisco has acquired eleven Israeli companies and invested in nearly 30 since 1997; Broadcom has acquired and invested in over ten Israeli companies since 2000.

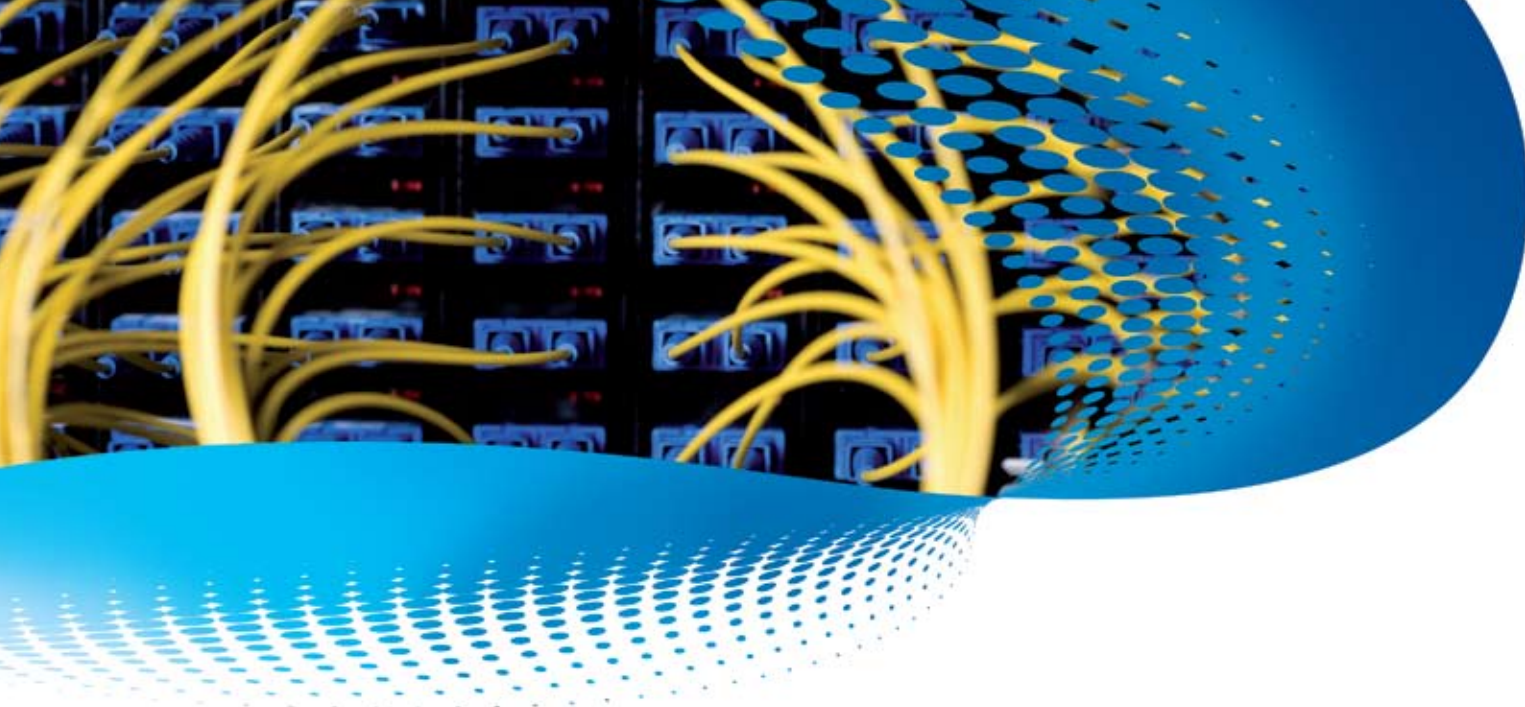
Motorola was one of the first multinationals to start an R&D facility in Israel, back in 1964. The Israeli center played a dominant role in some of Motorola's major breakthroughs in the field of mobile and cellular communication, including the world's first car-phone. Today, Motorola's activities in Israel include manufacturing and field services, generating annual revenues of nearly \$1bn.

Intel founded its first Israeli R&D center in Haifa in 1974 with just 5 employees. The Israeli division of Intel has grown to become the largest employer in the country, with five R&D centers in Haifa, Jerusalem, Kiryat Gat, Petach Tikva, and Yakum. Intel has selected Israel as the site for some of its most advanced production plants, at a total investment of approximately \$6bn in 2009.

With more than 35,000 professionals employed in R&D, the multinationals' R&D centers in Israel have become a source for worldwide strategic development. Today, around 60 foreign R&D centers are engaged in a diverse range of activities including Communication Equipment, Components, Communication Software, Value Added Services, Internet Communication and more.

- In recent years, global players such as Microsoft, Google, IBM, HP and Samsung have established or significantly expanded their R&D centers in Israel.
- In January 2008, Yahoo announced the founding of an R&D center in Israel.
- Over half of the foreign technology R&D centers have development activities in the Communications sectors.

- Motorola's cell-phone components are produced at Freescale Semiconductor's Israeli R&D center (formerly Motorola Semiconductor), the company's largest development center outside of the US.
- Intel develops and manufactures most of its mobile components including its mobile WiMAX chipset in its Haifa plant.
- Microsoft has established a Communication R&D center in Herzliya, where dozens of telecom engineers are developing Microsoft's next generation Communication platform.



Israeli Communications - The Bigger Picture

Stable Economy

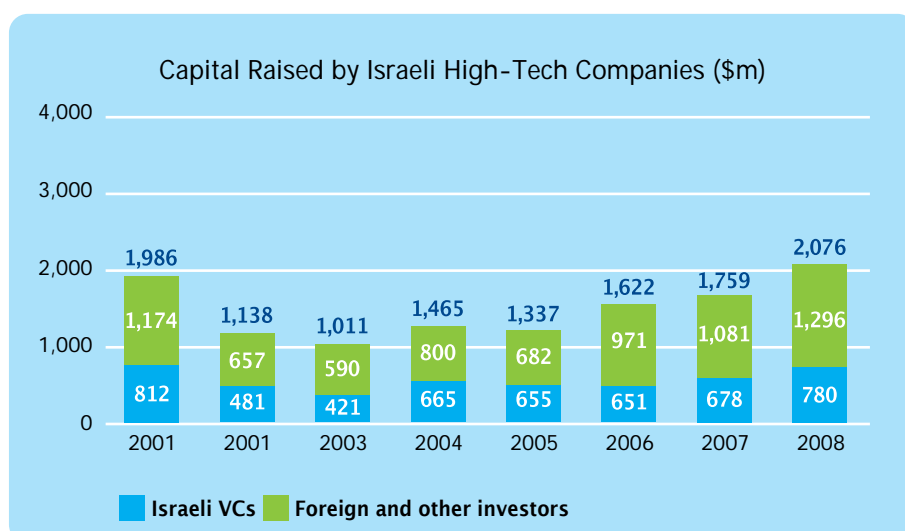
Israel has a stable and mature economy, with a low annual inflation rate and high growth rate. According to the Economist, Israel is one of the five fastest growing emerging markets throughout the past 20 years.

Advanced R&D

Israel invests 4.7% of its GDP in civilian R&D - the highest rate worldwide (IMD World Competitiveness Yearbook 2009).

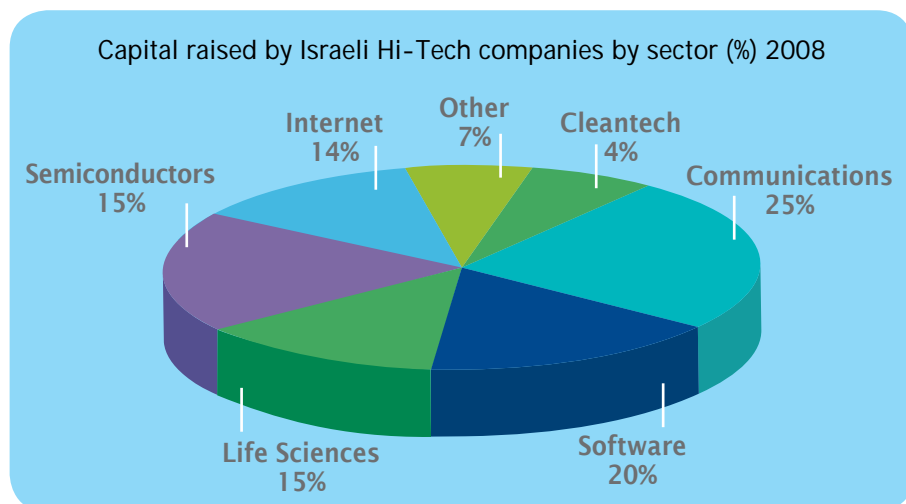
Bubbling VC Scene

Israel is ranked by IMD and WEF as second only to the U.S. in Venture Capital availability. Funding from local and global VC firms provides Israeli entrepreneurs with the necessary backing to turn innovations into profitable businesses.



Source: IVC Research Center, 2009

In 2008, Israeli high-tech companies raised \$2.08 billion from local and foreign venture investors, 18% higher than the previous year, notwithstanding the global financial crisis. The communications industry captured a quarter of this amount, higher than the 21% share of total VC captured in 2008 and a testimony to this advanced and successful sector.



Source: IVC Research Center, 2009

Imagination, Ingenuity and Innovation

One of the many factors contributing to the business success of Israel's Communications sector is its modern business climate that rewards risk-taking and originality. The informal social networking atmosphere, with its different socio-economic backgrounds and multicultural environment supports convergence of innovative technology and the acceleration of business development. Israeli engineers are renowned for their agility and resourcefulness, which helps get new products to market quickly with the right solution to almost any problem.

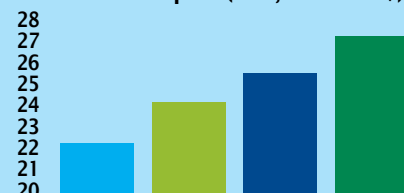
The Education Factor

Israel was ranked second by the IMD in 2009 for the availability of scientists and engineers - ahead of Ireland, Finland and Singapore. 50% of the population aged 25 to 34 has attained at least tertiary education, placing it 6th in the world behind Singapore, Japan, and Korea (IMD Competitiveness Yearbook 2009), and approximately 24% of Israel's workforce holds university degrees - placing it 3rd in the industrialized world after the USA and the Netherlands. Israel is ranked #2 in the world in % of engineers and scientists in the workforce by the IMD (2009).

Economic Indicators

2005 2006 2007 2008

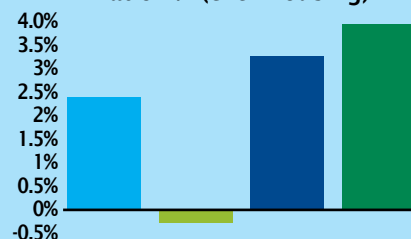
GDP Per Capita (PPP, 1000 US\$)



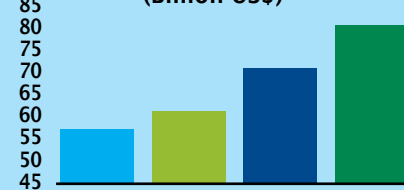
Unemployment (%)



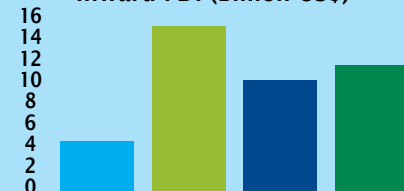
Inflation % (excl. housing)

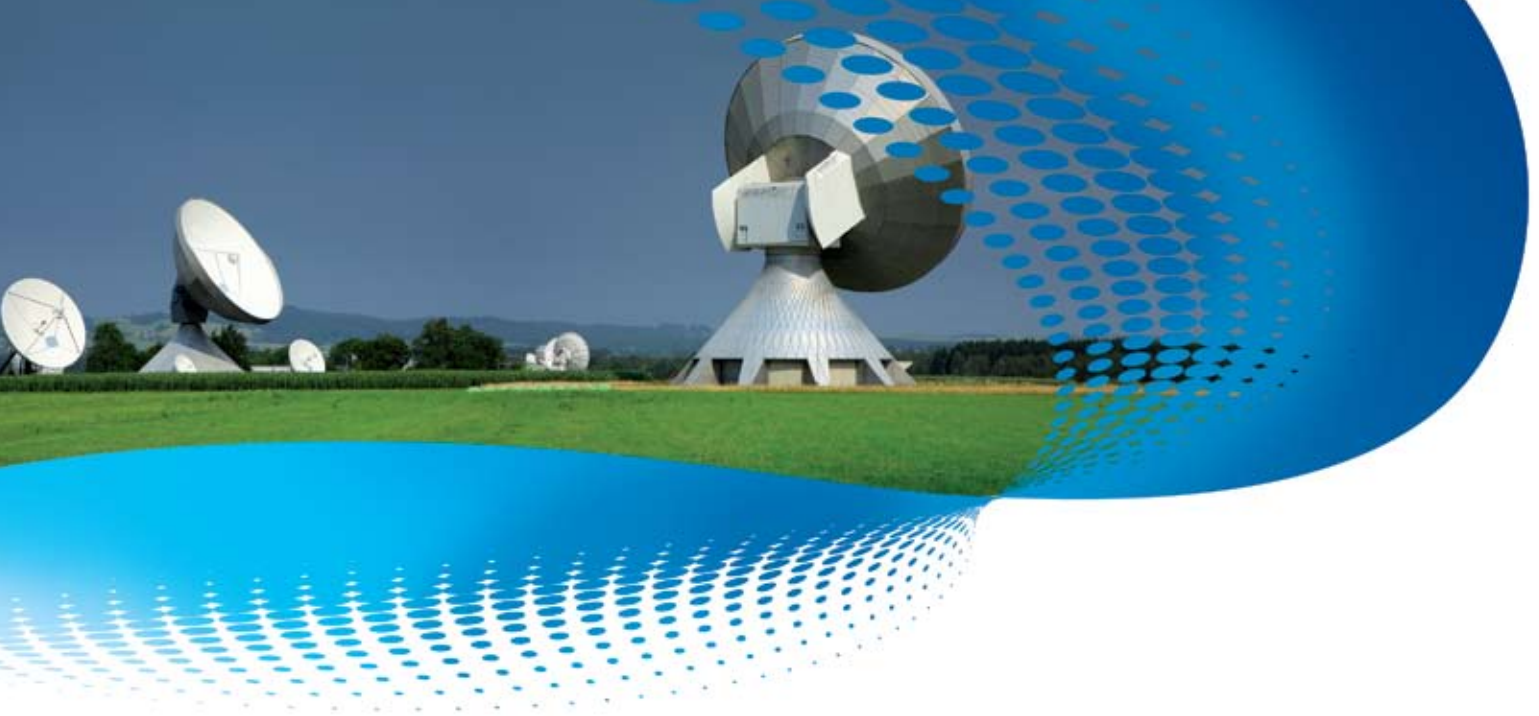


Exports - Goods & Services (Billion US\$)



Inward FDI (Billion US\$)





The Defense - Industry Symbiosis

Highly trained graduates of the Israel Defense Forces and defense industries often join Communications companies and convert defense technologies into civilian applications. The convergence of the two sectors has led to breakthroughs in Speech Recognition, Fiber-Optics, IPTV and Wireless communication. VoIP was invented in the Israeli Air-Force in the early 80's and was converted to civilian application in the 1990's by the Israeli start up, Vocaltec.

Advanced Communication Infrastructure

With its highly developed local Communications market, Israel acts as an international prototype by implementing its technology at home. The local infrastructure includes:

- 80% Penetration of Internet to businesses
- 89% Internet penetration to households
- 92% Penetration of digital Multi-channel TV
- 95% Penetration of Cable TV to households
- 100% Penetration of Mobile phones
- 100% Home-Pass rate with 3 networks: Twisted-Pair (PTT), HFC (Cables) and 4 Wireless cellular providers.
- 3 million main telephone lines and 7.5 million mobile customers on 4 networks
- Israel was an early adopter of broadband Universal Service Obligation (USO) for Broadband Regulation with 100% population coverage in 5 years.



Government Support

The Israeli government offers incentives, vehicles and programs to encourage investments in technology oriented companies and projects. Governmental support for R&D in the form of grants, technology incubation programs and benefits to foreign investors enhances Israel's attractive technology climate.

R&D Incentives

The Office of the Chief Scientist (OCS) provides a variety of support programs that operate on a yearly budget of about \$400 million. In addition to the R&D fund, bi-national funds for competitive R&D provide infrastructure and for joint R&D programs with foreign counterparts.

The Global Enterprise R&D Cooperation Framework encourages cooperation in industrial R&D between Israel and multi-national companies, whereby joint R&D projects authorized by the OCS could be entitled to financial assistance of 50% of the Israeli company's R&D approved costs.

Technological Incubators

As massive repositories of potential ideas, the Israeli technological incubators have helped make Israel's hi-tech entrepreneurship world-renowned. Since the inception of the incubator program in 1991 and to the end of 2008, over 1,150 projects have graduated from the program. By the end of 2008, the total cumulative private investment in graduate incubator companies surpassed \$2.5 billion.

Benefits for Foreign Investors

Special tax benefits are available for foreign investors, often determined by the percentage of foreign control of a company. Automatic tax reductions are offered to companies based on the location of the investment, benefit period and the size of the investment.



Invest in Israel Is the Investment Promotion Center of Israel's Ministry of Industry, Trade and Labor. The center serves as a focal point for foreign based companies and individuals interested in investigating direct investment and joint venture opportunities in Israel. Invest in Israel works closely with potential and current investors throughout the investment process and serves as a source for investment related information.

For more information, please visit: www.investinisrael.gov.il
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*Small Country,
Big Impact,
Infinite Promise*

Sources include:

The Israel Export and International Cooperation Institute, CBS (Central Bureau of Statistics), IDC, IMF, Israel Association of Electronics & Information (IAEI), D&A High-Tech Information, Communication Solutions, IVC, Deloitte Touche TMT, and VentureSource, IMD World Competitiveness Yearbook, WEF - The Global Competitiveness Report



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The background of the right half of the page is a dynamic, abstract image with blue and white streaks, suggesting speed and technology. A large, stylized white 'V' is superimposed over the text 'Invest in Israel'.

Invest in Israel

where *breakthroughs* happen