



21st Century Innovation Hubs

In the flat universe, technology innovation no longer follows the outsourced manufacturing model that actually pioneered the outsourcing wave. In place of models where products were designed in locations like the US and then mass produced in cost efficient locations like Mexico or China, in the new software model, software innovation itself follows a distributed computing model.

Technology companies are realizing that to be truly global, they need to tap innovation “springs” at many more locations, and often, close to their new high-growth markets. Which means that the new hot spots of software innovation are Israel (where the trend was seen earliest), India and China.

The Emerging Innovation Triumvirate

We are seeing a whole new age of globalization today: with the explosion of technologies, knowledge pools and people are connected like never before and the rules of the game have changed irreversibly. The death of distance, a result of the wired world we now live in, has opened up possibilities for individuals, enterprises and nations. Three countries that are taking full advantage of this paradigm shift are Israel, China and India.

Israel, in many ways, is the leader of the pack. An economy driven by the high tech industry- with nearly a half of its exports from it,- Israel has demonstrated that a combination of brain power, technical education and entrepreneurial climate can foster a climate of innovation. Israel's economic success has been based on a highly educated workforce, which also possesses a strong sense of entrepreneurship and ability to adapt to rapidly changing demands. At the same time, the government has invested heavily in universities and industrial R&D initiatives.

In contrast, China and India are charting a different path to being recognized as global technology innovation hubs. Among the fastest growing economies of the world, and predicted widely to be among the top three global economies in the next two decades, the two countries have “earned the right” to become innovation springs, thanks to the size of the technology talent pool, government support (though of differing degrees), fast-developing ecosystem and now prevalent entrepreneurial culture.

Globalization of innovation – Drivers

In fact, in an increasingly flat world, the geography of innovation is changing. As John Kao, innovation consultant argues in his recent book, “Innovation Nation: How America Is Losing Its Innovation Edge, Why It Matters, and What We Can Do to Get It Back”, all the key advantages once enjoyed by the U.S. are disappearing. While in the 20th century, leading-edge thinking emanated from the “West”, today, the rise of Asia is evening that out.

v

What are some of the drivers for the globalization of innovation?

Talent is ubiquitous

It is now a well documented fact that India has the largest pool of English-speaking, technically trained manpower. China is doing all it

All the key advantages once enjoyed by the U.S. are disappearing. While in the 20th century, leading-edge thinking emanated from the “West”, today, the rise of Asia is evening that out.

*- John Kao,
Innovation Consultant*

Every year, China produces 600,000 engineers and India produces 450,000 engineers. In comparison, the US produces 70,000 engineers.

can to make its educated class English literate. Israel, interestingly, has the highest per capita engineering educated employees. Every 140 out of 10000 employees in Israel are qualified engineers, compared to only half that number, 70, in the US and 65 in Japan. Every year, China produces 600,000 engineers and India produces 450,000 engineers. In comparison, the US produces 70,000 engineers. Several global corporations are therefore taking the logical step of broad-basing their innovation efforts:

- General Electric (GE) has setup an R & D laboratory, the largest R & D center of its kind outside the US, in Bangalore and over 1000 GE researchers work on leading edge solutions out of this facility.
- Microsoft has established R & D facilities in China and India. In fact, Microsoft's R&D activities in India are second only to Redmond. The India center works on over 50 of its products including the Vista product development initiative. It is also believed that the company filed for over 150 patents for work done from its India centers.
- Likewise, Oracle was one of the first companies to set up a development center in India. Today, Oracle's strength in India is largest after Belmont, its US headquarters.
- Cisco plans to invest \$1B in India in the next few years, of which about three quarters will be allocated to R&D.
- Indian units of US firms such as Cisco Systems, General Electric, IBM, Intel, Motorola and Texas Instruments filed over 1000 patents in the year 2004 alone.

And that's not all. Did you know that the Centrino chip was created largely out of Intel's Haifa unit in Israel? And that over 35,000 people work in R&D centers of global corporations in Israel?

Another related point, talking of talent, is the favorable demographic profile of, say, India's population. While in the US, a large chunk of the population will soon comprise of older people, including retirees, countries like India with a growing, youthful population, have a distinct advantage.

Capital is ubiquitous

The concept of venture capital took root in the US, in the 1920s and 30s, when wealthy families and individual investors provided the start-up money for companies that would later become famous. And thus were born companies such as Xerox. General Doriot, a professor at Harvard Business School, set up the American Research and Development Corporation (ARD), the first firm to finance the commercial promotion of advanced technology developed in US Universities. ARD's investment in Digital Equipment Corporation (DEC) in 1957 was a watershed in the history of VC financing. Thus, the US does have a long history of venture funding. And this led, in many ways, to the development of the Silicon Valley as the world's most successful hub of innovation.

Cut to 2008. The situation is quite different. Venture firms, realizing the potential of emerging hubs such as Israel, China and India, have set up funds to cater to start-ups in these regions. At last count, Israel has more than a 2000 thriving tech start ups – of these, 462 raised \$1.76 billion from local and foreign venture investors in 2007.

At last count, Israel has more than a 2000 thriving tech start ups – of these, 462 raised \$1.76 billion from local and foreign venture investors in 2007.

Venture capitalists invested more than \$777 million in 57 deals for entrepreneurial companies in India during the first three quarters of 2007, according to the Quarterly India Venture Capital Report published by Dow Jones VentureOne and Ernst & Young. This was nearly five times the \$158 million invested during the first nine months of 2006 and more than twice the annual investment record of \$320 million set in 200. That is quite spectacular, to say the least.

Now move to China. Venture capital players are showing great interest in Chinese startups that supply the software, chips, and networks to feed the country's nearly half a billion mobile-phone users' need for wireless data. In 2006, VCs invested over a \$900 M on IT companies, an increase of 34% compared to 2005, according to a study from Dow Jones (DJ) VentureOne and Ernst & Young.

Interestingly, from a situation where entrepreneurs from Asia went to the Silicon Valley to get access to capital, today, companies in the Silicon Valley need to globalize their operations to optimize fund utilization, in order to compete for funds. And this has resulted in numerous Valley startups setting up shop in India, for example.

Companies in the Silicon Valley need to globalize their operations to optimize fund utilization, in order to compete for funds. And this has resulted in numerous Valley startups setting up shop in India, for example.

Yet another interesting trend is the collaboration between the newer innovation destinations. The China Development Bank and IDB Group, Tel-Aviv, Israel have invested \$50 million in the Infinity I-China Fund. The I-China Fund has served as an initial bridge between Israel and China and, has raised around \$350 M. The Infinity I-China Fund, invests in late-stage Israeli technology companies with parallel investments in Chinese businesses that license Israeli technologies to develop and market them in China.

Clearly, access to capital is no longer an impediment to innovation.

The innovation ecosystem is ubiquitous

What distinguishes the Silicon Valley from any other innovation hub, even today, is the well evolved ecosystem to foster innovation.

What are the components of this ecosystem? Startups, entrepreneurs, technologists, attorneys and big tech companies that are potential buyers, not to mention VCs and angels. More intangible, but as valuable, is the risk-taking culture that has been inculcated owing to the tremendous success seen by Valley entrepreneurs over the years. It was believed for long that it would be impossible to replicate this environment elsewhere as it required a coming together of so many factors.

However, Bangalore, often dubbed the Silicon Valley of India, has managed to simulate the environment quite successfully. Some reasons attributed to Bangalore's success are the presence of numerous R&D centers of global MNCs, support of organizations such as TIE and Nasscom, influx of VCs and prevalence of entrepreneurial climate (in part owing to the creation of wealth from the success of the IT services industry and from Bangalore being the preferred destination for Indian technologists returning from the US, especially the Valley). In fact, today Bangalore and Silicon Valley are quite interconnected, with numerous startups working with a cross border operating model.

The IITs in India have played a very important role in nurturing and incubating ideas that have today become successful commercial products.

The role of academic institutes in fostering innovation needs to be emphasized. The IITs in India have played a very important role in nurturing and incubating ideas that have today become successful commercial products. Prof Jhunjhunwala, IITChennai, has contributed greatly to the success of companies such as Midas Communications.

The alumni of IIT, specially those that have tasted success as entrepreneurs, have created forums for facilitating interactions within the community- a good example is Proto.in, which according to the website, is a platform for entrepreneurs to express their visions and showcase their imagination, with a working prototype, for the world to see. It's about increasing partnership, collaboration and mindshare among a distinguished, qualified and well-connected audience. Proto.in provides a unique platform

for promising startup talent to communicate their creativity and innovation potential. As a meeting place for the smartest entrepreneurs, venture capitalists and professionals, Proto.in stands true to its mantra “Create, Contribute, Collaborate.” In addition to IIT, management institutes such as the IIMs and ISB also have incubation centers to nurture ideas with potential.

Companies such as Microsoft also have on- going initiatives for identifying and assisting innovative technology companies. Microsoft is also planning to set up a first of its kind Innovation Triangle Park in Pune this year.

Last, Nasscom too has done many different things to foster a climate of innovation. Their award for the Most Innovative Technology Company of the Year is now much sought after.

The development of China into an emerging innovation hub traces a slightly different path. The creation of the much needed ecosystem is being virtually managed step by step, by the government. One of the main goals of the economic reform process, started in 1978 by Deng Xiaoping, was to raise China’s indigenous technological capabilities. In fact, China adopted a dual strategy for economic development - industrialization and informatization.

Israel in many ways has emulated the Silicon Valley experience owing, in part, to its strong links with the US and also because of the strong entrepreneurial culture and high quality of technically trained people available. The government also has played an important role in nurturing the high tech industry which, as mentioned earlier, is the main driver of the country’s economy and exports.

From the beginning, the country has sought to differentiate itself as an intellectual powerhouse, to make up for its lack of size and natural resources. Altogether, Israel spends about \$300 million annually on academic research, with most of the money coming from the government. In addition, grants are available for research projects, to the tune of \$100M, that support thousands of projects.

University research and development foundations, the first of which were established in 1952, are responsible for the interaction between researchers and the world of industry; they facilitate the commercialization of innovative ideas. A recent study shows that universities are Israel’s leading patentees at home and abroad, and that the relative size of their patenting activity far exceeds that of higher education sectors in other countries.

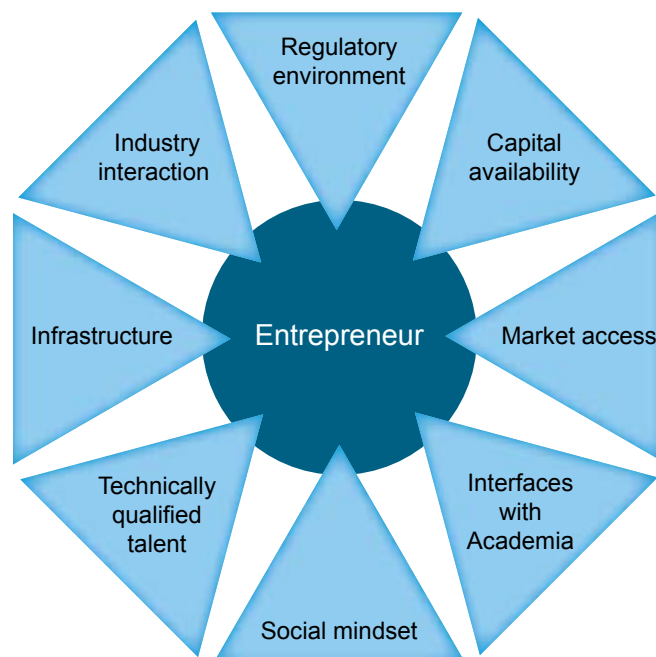
A recent study shows that universities are Israel’s leading patentees at home and abroad, and that the relative size of their patenting activity far exceeds that of higher education sectors in other countries.

The Israeli government also established an office of the Chief Scientist to encourage the growth of R&D based industries. Each Chief Scientist acts as advisor to the minister on matters of industrial R&D and implements government and ministerial decisions in this area. The chief scientist is also responsible for providing financial aid to worthy R&D projects, as well as guidance and training to new enterprises and funding for industrial and technological incubators. The chief scientist promotes cooperation with foreign countries to advance bi-national activities and tries to generate risk capital in Israel and abroad for the development of innovative technology.

Demand is ubiquitous

This is perhaps the most important trend that has catalyzed the globalization of innovation. Both India and China have similarities here. Emerging but fast growing economies with huge populations, both countries have a strong, growing local market. Take China, which has led with telecom, an industry that has played a crucial role in putting China on the innovation map. China has advanced its telecom industry at a phenomenal rate during the last decade. It now has the world’s largest telecom networks and

second-largest number of Internet users. It is likely to be the largest Internet market in terms of the number of Internet users by 2010, though the overall penetration rate will still be low. In the process, a sophisticated ecosystem is being created, comprising global MNCs as well as innovative local companies.




Innovation Ecosystem: Adapted from a NASSCOM Framework

In a recent report by the Boston Consulting Group (BCG), among the top 100 emerging global companies based in rapidly developing economies, 44 are Chinese companies, 18 (41 percent) of which are in the telecom and IT industries. These include telecom equipment makers (Huawei, UTStarcom, and ZTE), telecom service companies (China Mobile and China Netcom), computers and IT components manufacturers (BOE, Founder, and Lenovo), and consumer electronics and home appliance companies that also produce large numbers of telecom end-products (BYD, Galanz, Gree, Haier, Hisense, Konda, Midea, Skyworth, SVA, and TCL). Let us take Huawei Technologies. The company, which produces telecom products for convergent networks, innovated to produce highly inexpensive components to serve the burgeoning local and global demand. Today, the company's products are sold in 18 countries and it has filed for more than 1000 patents.

Closer home, India's path to innovation is a bit different. Unlike China, the local demand for IT was rather insignificant till recently, and India remained one of the few examples of a country creating a capability nurtured and honed to serve the global market exclusively. In time, two trends emerged- there was little room for newer IT Services Company as the first movers acquired scale, size and reputation. So, if you wanted to be in IT, you needed to do something different. At the same time, the Indian economy began growing at a superb pace and suddenly the local demand became relevant. Add to this, successful techpreneurs returning from the West to participate in the now interesting growth story, and you had a far better environment for creating IP led solutions. And thus were born companies such as Tejas Networks, Midas Communication, Mobiapps and Satnav.

Huawei Technologies, which produces telecom products for convergent networks, innovated to produce highly inexpensive components to serve the burgeoning local and global demand. Today, the company's products are sold in 18 countries and it has filed for more than 1000 patents.



Israel, a tiny nation in comparison, with a total population the size of Bangalore, has a different story to tell. As a country almost bereft of natural resources, special emphasis was placed, from the beginning, on the need for advanced education and scientific research. In fact, the combination of the educational and scientific infrastructure led to the creation of a high-technology led economy. Surrounded by hostile neighbours, the country felt compelled to bolster its military activities. And, also continually leverage world-class technical training of its military officers into success in the communications technology marketplace.

Prayag Takeaway

The ultimate litmus test of any trend is the results. So, if the hypothesis that innovation is becoming global is true, then we need to be seeing the outcomes. Israel is in that sense, a proven success story. With benchmark companies like internet security firm, Checkpoint Software and multimedia player Comverse Technologies, and over a 35000 strong R&D workforce and, significant exports in high tech, the country has arrived as an innovation destination.

Moving to China- we already spoke of Huawei, which exemplifies the Chinese model. YeePay, an electronic payments company has Visa of China for a customer and Lingtu, a creator of digital maps supplies location-based services to mobile-phone giant China Unicom (CHU).

And as for India, there are many interesting examples discussed in the earlier sections. Interestingly, Bangalore is now also becoming the R&D hub for global start ups. Take the case of Read Ink Technologies, a small, privately held company specializing in document analysis and handwriting recognition technologies. The company is are based in Silicon Valley with its R&D centre in Bangalore where Dr. Thomas O. Binford (Professor Emeritus, Stanford) leads a team of 15 engineers, mostly hired from the IITs.

Another example is Open-Silicon, a two-year-old silicon engineering company that aims to create the most cost-effective, predictable and reliable custom ASIC solution to electronics product customers worldwide. The company's engineering team is based in Bangalore while its marketing activities are carried out of Silicon Valley.

In conclusion, the flattening of the world is in progress - while it may not be evident across the board, and counter examples may be put forth, as far as technology innovation is concerned, there are sufficient examples to validate the trend. Israel is a proven model while the jury is still out on India and China. There is still a lot of work to be done to transform these two service driven nations into innovation hubs. However, it is widely believed that if the broad trends being seen today continue, we will see much of 21st century innovation originating from India and China.

For more information on this topic and to read similar articles, visit our website www.prayag.com.

Prayag Consulting
No.19, BHCS Layout
Bannerghatta Road
BTM 2nd Stage
Bangalore - 560076
Ph: (91) 80 26680216/41200439
Fax: (91) 80 26683433
info@prayag.com