Focus: Looking to High-Tech Startups to Drive Open Innovation

—Open Innovation and Challenges for Japanese Companies—

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1. Drivers of Open Innovation

The concept of open innovation is starting to take root in Japan. Open innovation is a way for firms to combine internal and external ideas in an organic fashion to create value. Since Henry Chesbrough introduced the concept in 2003, open innovation has been increasingly employed both in academia and in business practices. The Japanese approach to management that traditionally specialized in accumulating management resources internally, is now at a turning point, so the notion of open innovation appears to reflect the trend whereby Japanese companies are seeking—being compelled to seek, to be more exact—external ideas and technologies. External technology can be acquired through collaborative R&D and by using patents, forming joint ventures, and investing in or buying startup firms. The partner can be a company in a different field or a competitor, but universities, public research institutes, and high-tech startups are increasingly viewed as promising partners.

The Cohen-Boyer patent for genetic recombination filed in the U.S. is a well-known example of university technology. The patent was licensed to numerous major pharmaceutical companies, and generated US$250 million in licensing revenue through Stanford University's Office of Technology Licensing. For high-tech startups, there is the example of Google's purchase of YouTube several years ago, at a price of $1.65 billion. There are plenty of licensing and buyout deals in Silicon Valley that have been quite successful, though not on the same spectacular level as the Cohen-Boyer patent or YouTube buyout.

2.Japanese Companies Look Abroad

Among Japanese companies, one example that recently made a major splash was the news of Toyota's investment in Tesla Motors. There are also many examples of major Japanese pharmaceutical companies that have received licenses from U.S. and European biotechnology firms with promising technology seeds, or bought them out

entirely. Outside of biotechnology, there are quite a few examples of Japanese companies setting up offices in Silicon Valley or in the Cambridge Science Park in the U.K., to gain better access to high-tech startups and university researchers. Japanese companies are also constantly visiting venture capitalists, seeking to be introduced to promising startups. Many large Japanese companies are actively gathering information about startups, although these efforts are rarely covered in the Japanese media.

I have studied cutting-edge breeding grounds for high-tech startups starting with visits to Silicon Valley since 2004, and through visits to Cambridge, U.K. and Hsinchu, Taiwan. The findings were released as a casebook with my co-researcher (Taji and Tsuyuki, 2010), some of the contents of which I will share in this article. Among the case studies in the book are two U.S. startups that developed separate gene therapy drugs. One startup was a spinoff from Genentech, a well-known biotechnology drug development firm, which had developed a drug for treatment of growth disorder. After going public, the startup was bought out by Ipsen of France. The other startup was an academic (university-launched) startup that had developed a hepatitis treatment drug, leveraging technology developed by a professor of Stanford University. This firm inked a collaborative development agreement with U.S.-based Pfizer Inc. to gain huge funds. In fact, both of these firms have connections to Japanese pharmaceutical companies, with the former licensing its technology to Fujisawa Pharmaceutical in 2004, and the latter inking a collaborative development agreement with Takeda Pharmaceutical and Fujisawa Pharmaceutical in 2008 to gain funds.

There are many instances of Japanese companies actively approaching startups in the semiconductor industry. U.S.-based Techwell, Inc., which was founded by Hiro Kozato, is a semiconductor chip design firm that made headlines in 2006 with an initial public offering (IPO) on NASDAQ. In addition to receiving local venture capital, Techwell had been on the receiving end of investments from Yasuda Enterprise Development, Sanyo Electric, and Panasonic. There was also a U.K.-based startup that had developed organic electroluminescent (EL) technology, which went public and was later bought out by Sumitomo Chemical in 2007. In addition, there were two Taiwanese startups with semiconductor flash memory technology, one of which went public after receiving a major investment from Toshiba, and the other which filed for an IPO after licensing its technology to Sanyo Electric and Renesas Technology.

I had managed to gain access to these startups not through facilitation by Japanese companies that had partnered with these startups, but from local researchers, venture capitalists, and entrepreneur networks. In fact, the founders of startups frequently mention the names of Japanese companies when I interview them.

3.Problems with Overemphasis on International Startups

Japanese companies are focused on startups outside of Japan, but they do not pay the same close attention to startups in Japan. I am often told that it is because of a lack of appealing startups in Japan. Many managers of large Japanese companies point to the low technical level of Japanese startups in comparison with those of other countries and their lack of managerial talent and global strategies. However, it would be problematic if Japanese companies continued to maintain this stance in the future. While I will examine the issues facing Japanese startups later in this article, I will first examine the risks that arise from relying solely on startups outside of Japan to drive open innovation.

Even if Japanese companies make an effort to increase accessibility by setting up local laboratories and business offices abroad, it is reasonable to expect that they will still be a step behind the local companies that are based there. Business networks alone are insufficient. The alumni of local universities and networks that are rooted in social activities are bound by strong connections that are not readily visible to outsiders. In addition, Japanese companies have few experiences with technology assessment and business deals, so they tend to be weak in negotiation skills. Lamentably, according to a venture capitalist in Silicon Valley, startups that are considered unappealing to large U.S. firms are often brought in to Japanese companies. There is the concern that the lack of interest in nurturing Japanese startups will only further deplete the sources for innovation in Japan, which could lead to the hollowing out of manufacturing and even planning and design in Japan.

Next, I will look at the challenges for Japan from the perspective of large Japanese companies and startups, and Japanese society overall.

4.Challenges for Large Japanese Companies

Even though large Japanese companies have earned an international reputation for their high technology level, startups that have spun off from large Japanese companies and those that exist to commercialize university technology are considered to have a low technology level. The reasons given include a lack of talented human resources involved in launching the startups and inadequate funding, which make the startups unappealing to large Japanese companies and dampen their interest in investment. There is also a lack of role models for engineers working at large Japanese companies,

which diminishes the desire to start their own companies. The resulting chicken-or-egg debate has been endlessly discussed at study group meetings and seminars, and in meetings behind closed doors.

We need to look to large Japanese companies to make an effort to nurture Japanese startups, in order to escape this vicious circle. The investments do not have to be large. Large Japanese companies can fund startups by paying up front for prototype development costs, rather than waiting to buy until the products are realized. With the exception of biotechnology startups, I have observed that it is quite rare for large Japanese companies to pay up front for collaborative R&D. I have also been told of cases in which Japanese companies have had bitter experiences from paying up front to startups, only to receive products with inadequate quality or have the startup go bankrupt before delivering the products, which have made them leery of providing such funding. However, startups by their very definition are risky entities. There are countless startups in Silicon Valley that have gone bankrupt or dissolved, and it stands to reason that many Japanese companies have had negative experiences with startups outside of Japan.

I was told of one instance in which a large Japanese company refused to pay up front for what amounted to only several tens of millions of yen, yet the same company is investing several billions of yen in startups outside of Japan. It seems there are a number of reasons for the disparity, such as different individuals having decision-making authority over proposals in Japan and abroad, and the lack of interest in investing in Japanese startups to begin with. Nevertheless, the company in question makes investments in startups abroad by incorporating various risks, and signs agreements for collaborative R&D with them.

I also need to emphasize that large Japanese companies should meet the challenge of externally releasing proprietary technology seeds that they are not using. The laboratories of large Japanese companies have projects that have been shelved, and technology seeds that they are not fully using, in-house. These technologies can effectively be transferred externally or licensed for overall economic effect. The partners in this case do not have to be restricted to large companies. They can include employees who wish to use the technology to start up companies (so-called “carve-outs”), as well as startups with an established track record in the same field. However, there are still few examples in which carve-outs have grown through receiving venture capital and other external investment, and have exited through an IPO or buyout.

I hope to see more future instances where technology is externally transferred or licensed to startups with an established track record in the field. One such example is the startup J-Magic, which in 2007 used face recognition technology developed by Oki Electric Industry to roll out a content service for mobile phones. Two years later, the service was transferred to Mobile Factory, a private corporation. We need to see more examples like this happen. Incidentally, licensing contracts with startups typically involve receiving royalties against net sales or profits.

5.Challenges for Startups

Executives of high-tech startups need to be able to formulate and execute global business strategies, but there are few such human resources in Japan. There is a particular shortage of people who can orchestrate everything from securing the funding needed to launch a startup through to building alliances, and who can promote business deployment on a global scale. The executives of Japanese startups are often the researchers or engineers who have developed the core technology of the startup, which is typical of both spinouts from large Japanese companies and academic startups. Here, I would like to focus on academic startups specifically. These firms are likely to be significantly handicapped by having a founder whose only career experience is as a university researcher, acting in the capacity of a CEO instead of a chief technology officer (CTO). Japan established the Industrial Technology Enhancement Act in 2000, which relaxed the restrictions on teachers at national universities to engage in a subsidiary business, but there have been barely any opportunities for science and technology teachers or researchers in Japan to be exposed to corporate management.

By contrast, university researchers in the U.S., Europe and Taiwan face a very different environment. In the examples covered in my book, university professors have founded startups in the Silicon Valley, and in Cambridge, U.K. and Hsinchu, Taiwan. In those countries, university teachers are permitted to simultaneously serve as executives of startups, and it is not uncommon for them to switch to a career in private industry, which enables researchers to build knowledge and expertise in business management. However, in the case of startups in the U.S. and U.K., researchers typically take a position of science advisor or in a similar capacity, and the startups hire experienced human resources as their CTO or CEO. These human resources who look after the management of startups are specialists at what they do, and are competent enough to be welcomed numerous times to take CEO positions.

One successful Japanese academic startup is AnGes MG, which I covered in my book. The firm was initially steered by an executive recruited from a foreign-affiliated pharmaceutical company where the individual was responsible for overseeing global

business strategies. The firm was propelled by a successful alliance with another company, and in preparing to go public, hired executives with extensive experience in financial strategy. After the IPO, the firm hired executives to oversee its diversified management including buyouts of international startups. These moves enabled the firm to set out on a path of growth, and illustrate how high-tech startups must make timely decisions to replace executives based on their stage of growth.

One other issue that needs to be pointed out about managerial talent is the lack of serial entrepreneurs in Japan. In the U.S. and U.K., the founders, founding members, and senior management positions of startups are often serial entrepreneurs who have had experience launching numerous startups. This is rarely the case in Japan, because of the long period it takes between launching the startup and exiting, and because a single executive often remains as CEO for a long time. In addition, Japanese financial institutions customarily demand personal guarantees from executives to back corporate loans, so the executives can lose their personal assets if there is a bankruptcy. In the worst case scenario, the individual takes on the liability, making it nearly impossible to start up a company again. In Japanese society, even if a person does not take on a liability, it is difficult not to erase the stigma from a failed business, making it inherently hard for entrepreneurs to rise again to the challenge of starting a company. This is an issue for Japanese society overall.

6. Challenges for Japanese Society

The tax system and financial systems are critical to having an environment in which startups can grow. Looking at funding specifically, a continuous flow of funds is a life-or-death issue for high-tech startups, as they need considerable cash since it takes significant time and funds to establish their business. There is what is known as a finance gap in Japan, wherein startups can tap into government funds and loan guarantees at the launch stage, but subsequently face a gap in available funding. If the startup is able to survive to the later growth stages, it can then tap into investment funding from business investment companies and venture capital, as well as bank loans. Needless to say, Japanese startups have barely any access to investment from large Japanese companies, and the availability of venture capital funds is extremely small. According to recent figures, the balance of investment at the end of 2008 amounted to $197.3 billion in the U.S., compared with just $10.5 billion in Japan. This gap in absolute amount of investment is delaying the growth of Japanese high-tech startups.

The lack of overall employment mobility in Japanese society also has an impact on the shortage of talented human resources with the wealth of experience to support the executives of startups. In Japan, it is customary for companies to hire inexperienced

workers en masse from graduating classes and develop them internally over the long term, but this system works to the disadvantage of those who leave and join companies in mid-career. Job mobility in Japan typically involves downward move from large companies to small companies, and almost never involves being hired by another large company in mid-career after having worked at a startup. Furthermore, outstanding human resources rarely leave once they have been hired by a large company, nor are they likely to even consider working at a small and minor startup.

As I have covered here, there are a multitude of accumulated issues. I want to stress that it is essential for both large Japanese companies and the overall Japanese economy to breed and facilitate the growth of high-tech startups, in order to achieve innovation in the next generation.

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