

PRESENTATION:

**THE UNIVERSITY OFFICE
OF TECHNOLOGY TRANSFER: JAPAN**

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I am very pleased to be invited to such a significant conference for the second straight year and I appreciate Professor Takenaka's kindness and effort. I am a researcher of intellectual property law at the Research Center for Advanced Science and Technology (RCAST), University of Tokyo. Since 1997, the intellectual property department has been one of the five principal departments of RCAST. Since then we have had an international exchange program with CASRIP. It is also a great pleasure that CASRIP invited Professor Robert Kneller, my colleague at RCAST and Mr. Steven Maebius, a former visiting professor with us.

Four years ago the only persons speaking about technology transfer from universities to industry, among law teachers in Japan, were limited to those who had difficulty in finding topics for papers. I started studying this topic in 1996, but since then technology transfer has rapidly become a major topic. I have become one of the law professors who appears most frequently in major Japanese daily newspapers in the context of technology transfer. Also, in recent years law school graduates have fallen into disrepute in Japan because the Japanese follow the Americans in all aspects. I introduce myself as a lawyer only in conferences of lawyers such as this. Otherwise, I am a technology transfer specialist.

There are three reasons why technology transfer has so rapidly become a big issue in Japan. The first reason lies in the increasing demand for accountability on national universities. Japanese taxpayers have traditionally been much more generous and unquestioning than American taxpayers, but now they strenuously inquire into which tax funded programs are needed and which are not. Researchers at the universities must justify the social

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usefulness of their research efforts. For this reason building a mechanism for technology transfer is very important, especially for national universities.

The second reason lies in the tendency toward ever increasing competition among the national universities. Traditionally Japanese universities lacked any mechanism at all for driving competition. In my case—if I use somebody else as an example, she will surely seek revenge so I had better limit my talk to my own case—even if I don't lift a finger for my research an annual fund of about ten thousand U.S. dollars will be automatically allocated to me. This amount isn't a large sum of money, but is enough to take a nap in the laboratory. However, such good old days are going away. Although sanctions against napping professors are not yet usual, measures for providing incentives for high quality research have been established one after another.

The final undeniable reason is that the importance of university-based innovation has been acknowledged in the public opinion. When the Japanese economy was prosperous, we didn't have to maximize the utility of the professor's ability. However, such inefficiency is not tolerable anymore. Promotion of technology transfer is mentioned among the measures recently drafted by the government for strengthening the competitive force of industry. Boldly speaking, these three reasons are signs of penetration of market principles into universities.

Here I would like to brief you on the progress of technology transfer in recent Japanese history. In 1996, the basic plan for science and technology of the Japanese government, preaching the necessity of a technology transfer system, was released. In April 1997, the intellectual property department was established in RCAST. We immediately went to specific planning for technology transfer as the first research program and drafted the first tentative plan in June of that year. Meanwhile, MITI and the Ministry of Education opened the discussion about technology transfer. In the interaction of such discussion we drafted the second tentative plan in November. In August 1998, a technology transfer promotion law was enacted and we founded a corporation under the name CASTI, the Center for Advanced Science and Technology Incubation. Such movements toward the promotion technology transfer were covered by publications such as *Nature*, and *Science*. At this conference last year, Professor Adelman posed questions about this matter. As of today, six technology transfer organizations, including CASTI, have been established under the technology transfer promotion law.

So why did the technology transfer organization have to be established? You cannot fully understand the reasons without understanding the system under which most university based invention are owned by individual inventors. In accordance with section 35 of the Japanese Patent Law, an employer, that is, the nation or a corporation, can determine the ownership of an employee's invention. In connection with this report, an important point is that the Ministry of Education, which is the employer of teachers of national universities, admits most inventions are the property of individual inventors, by way of an official notice issued in 1978. This notice states that inventions become the property of the nation only in very exceptional cases. As a result, it is said that about 90% of all inventions created in universities become the personal property of the inventors. But because the borderlines are vague, the Invention Committee, a committee established in each university, ought to determine if an invention should be state owned or privately owned. At first glance such a standard appears to treat inventors quite favorably, to provide an incentive for outstanding inventors. Even in the United States granting ownership of an invention not to the university but to an individual is not permitted.

Since the official notice was issued as early as 1978, at first glance, the notice itself seems to be very innovative. This is, however, a very superficial observation. First, there is a problem concerning the invention committee system itself. The invention committee is one of the committees which are common in Japanese universities. In Japan every university has many important committees such as those for managing dormitories, regulating illegal parking on the campus, and formulating a plan for evacuation in the event of a disaster. All of the committees are composed of professors, so many of the committee members do not understand the importance of their duties, do not attend committee meetings, or, when they do attend, don't participate in the discussion because while they are sitting at the table they are busy thinking about the topic of their own research. Here, I must confess that I am one of such professors. Likewise, to many professors, it means assignment of duties irrelevant to their own research. Some professors have no interest even in the ownership of their own research results, much less in the ownership research results by another researcher. Since the invention committee is composed of such professors meetings are held infrequently. The exact frequency depends on the university, but generally speaking an invention committee meets about once a month. As a matter of fact, the committee does not meet during summer vacation. According to my studies, in a certain prefectural university—which is run

by the same standards followed national universities and has an invention committee—the invention committee has never met since its establishment.

As everybody attending this conference knows well, the Japanese Patent Law adopted a first to file system. In the introductory section of just about any textbook of Japanese patent law, it is stated that under the first to file system the law encourages the rightful owner to file an application as early as possible. In fact, Japanese corporations make strenuous efforts to do that. In contrast, in the case of an invention created in a national university, merely determining the rightful owner of an invention may consume several months, and this must be completed before an application can be filed.

If an invention is determined to be owned by the government, the first to file system imposes several restrictions on that invention. For instance, one professor, a colleague of mine, requested that the invention committee assign ownership of his invention, which showed great promise, to the government. The invention committee of the University of Tokyo accepted his request. If such a determination would have led to the result that Tokyo University would receive an annual research fund of \$1 million in licensing income, there would have been no need for us to create any technology transfer organization. However, the actual outcome of the invention committee's judgment was totally different. The professor heard from a bureaucrat that the entire budget for the fiscal year had already been expended and because this invention was owned by the government, the bureaucrat wouldn't be able to file a patent application before July of the following year. I have not heard how this invention was settled after that, but I know without a doubt that the invention brings no licensing income to our university. If the budget for patent applications is depleted so easily, it is hardly possible to file a lawsuit against patent infringement.

The most critical problems lies in the inventions owned privately by individual inventors. Private ownership of inventions means that the government as an employer doesn't care about such inventions at all. For example, this watch is my personal property, I can break this watch at my pleasure or I can sell it for \$1 or if possible \$1 million. If this watch were broken or stolen, neither the University of Tokyo nor the Japanese government would care at all. Similarly, if an invention is owned by an individual inventor, the government doesn't provide for expenditures associated with the invention and the owner must personally bear the cost.

Now you see the real reason why the Ministry of Education adopted the standard which at first glance appeared innovative as early as 1978. To begin with, very few researchers know a patent attorney personally. There

are only about 4,000 such patent attorneys in Japan, including persons who teach in universities, like Professor Takenaka. Further, the filing of a patent application costs about \$5,000, which is not a normal expense for individual researchers. Even if an invention is granted a patent, monitoring patent infringement, and filing a lawsuit would impose a heavy financial burden on the patent owner. This is important because, as you know well, only a few percent of all inventions achieve commercial success. For individual researchers it is nearly impossible to acquire, maintain, and manage patent rights long enough to enjoy commercial success.

The next question is: Have university based inventions failed to be economically utilized in Japan? The reality of the situation is as follows. In a prestigious university like the University of Tokyo each laboratory usually has a close relationship with several predominant corporations. Such a relationship has been established over a long period in many cases. Such corporations donate tens of thousands of dollars annually to the laboratories as research funds without any direct return. A professor, as the chief of a laboratory, usually feels indebted to the corporation in such a case. On the one hand, such a relationship exists between the laboratory and corporations. On the other hand, research results are the personal property of researchers and therefore our professor can dispose of them at his pleasure.

Further, taking care of the rights to the patent is very inconvenient to professors. For these reasons it is very natural for professors to assign research results to corporations for little or no charge in order to express their gratitude for long standing assistance from the corporation. In fact, according to studies performed by the faculty of the engineering department at the University of Tokyo, about 150 inventions from the faculty were assigned to corporations in 1995, most of them probably without charge. In such cases, the corporation becomes the patent applicant and the name of the university researcher is entered in the section entitled "inventor." What should we think about this situation? From one point of view, we can say that the research results from the universities are being economically utilized, even in Japan. Although the universities shouldn't evaluate individual inventions solely from the financial perspective, the inventions contribute to maintaining good relations with corporations and ensuring stable research funds for laboratories. I call such economic utilization of inventions "long term diversified settlement."

We may also view this situation critically. There are three problems. The first problem is that such a relationship between a professor and a corporation seems to be unclear, or not transparent. Long term

diversified settlement can't ensure accountability, which is increasingly demanded for national universities.

The second problem lies in that the inventor is not provided an incentive to create particularly promising inventions. In most cases the amount of donations from a corporation seems not to change according to whether research results in a good invention or not. There is no positive cycle of feedback, such as good research resulting in an increase in the research funds.

Finally, the most vexing problem is that inventions may be hoarded by companies without utilization. For example, one of my colleagues had invented a novel technique for examining the quality of water, and the technique was transferred to a certain manufacturer of sanitary equipment. The technique can also be used for examining the quality of river water and had great potential value in that field. However, the technique is insignificant to the manufacturer. For this reason the patent still remains listed in the patent book of the manufacturer and is not commercialized.

As mentioned above, each research laboratory has close relationships with a very limited number of corporations. In many cases selection of an alternate corporation is fairly impossible. In contrast, in the case of technology transfer through business dealings in the market, a corporation that has purchased a technique for \$500,000 would surely make efforts to acquire commercial profits which exceed the price. In this way the technology would be efficiently utilized for the sake of society. The biggest problem in dealings based on long term diversified settlement lies in this deactivation of market principles.

In consideration of the above described problems, what we should do to promote technology transfer appeared very simple to us. The solution was, in a nutshell, revision of dealing techniques in the market and rationalization of the dealings. In other words, creation of a market for dealing techniques through establishment of a special private company which follows an economically rational course. The corporation funded for this purpose is called CASTI.

The system we conceived was simple. In the past there has been, for researchers in universities, no alternative but to throw away or economize by just using the framework of the long-term diversified settlement with such results. However, from now on such research results can be transferred to CASTI so patent applications for the results can be filed, and when the patent is granted, transferred for licensing out to corporations. After a share of license income is set aside for CASTI, the remaining license income is distributed, in accordance with a predetermined rule, between the individual

researcher, the laboratory, the department, and the university. Presently we consider a fair distribution to be roughly one third to each of the individual researcher, the laboratory, and the university.

Technology transfer is like the whiskey business—but I'm not talking about a lot of romantic factors they have in common. Rather, I'm talking about the fact that the businesses don't yield profits at the start up. When we file a patent application it takes at least one or two years for the invention to be granted a patent. Further, a longer period of time is required for developing the patent into an actual product, introducing the product into the market, and obtaining a stable license income. This is the same as in the whiskey business, where a manufacturer of whiskey must wait for a long period of time from distillation until introducing properly-aged whiskey into the market. We must think about how to sustain a business until the business gets on the right track.

In this respect, CASTI is very fortunate to be blessed with advantageous conditions. If I limit my scope to the income from the market, the total sum of membership income, conserving from the authorized dealers and the authorized venture capitalists, can sufficiently cover several years of expenditures. I asked CASTI's managing executives before coming here, "What is the biggest concern of the current stage?" The answer was, "How to reduce tax payments." As one of CASTI's shareholders, I was truly satisfied with their answer.

The technology transfer business has just started among Japanese universities. It is at a similar stage as that of the United States in the early 1980's. In this situation, as is often the case, people attempt to learn from the experiences of universities in foreign countries, particularly those in the United States. More than a few of the attendees of this conference have been required to spend considerable time serving the inquiring committees which often come from Japan. However, you are still very lucky because of the Pacific Ocean that lies between Japan and the United States. I have to answer such inquiries about ten times as often as you do. As you can understand from such a phenomenon, the technology transfer business attracts special attention from Japanese universities. According to a survey conducted by MITI, the Ministry of International Trade and Industry, as many as 53 universities are considering the establishment of a technology transfer organization, in addition to the six existing organizations. We call this phenomenon the "first technology transfer boom."

The reason we call it a boom is because we think the phenomenon represents a transient boom and will ease off within a few years. Further, the reason we call it the "first" boom is that several years from now we will

witness the arrival of new era in which the technology transfer organizations surviving at that time will play a prominent role in society. I expect that CASTI will be one of the technology transfer organizations that will play a prominent role because, as you know, I am a shareholder. Thank you for your kind attention.