# "Transformation" Of Japan's National Universities Into Administratively Independent Corporations

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*The background of the April 2004 "Transformation" of Japan's national universities into administratively independent corporations.*

## 1. Introduction

In April 2004, Japan's 87 national universities, which include all but a few of Japan's major university research centers,[1] will become "National University Corporations," in other words, "independent administrative units" within the Japanese governmental structure.[2] This two-part article analyzes how this change will affect the transfer of university discoveries to industry as well as other aspects of university-industry cooperation. It is based upon more than six years studying the system of academic-industry cooperation from the vantage of a research center established 17 years ago in one of Japan's leading universities to promote interdisciplinary science and engineering research and cooperation with industry. This first part will discuss the evolution of the current Japanese technology transfer system up to the present time and end with the rationale for the transfer of intellectual property (IP) ownership to universities. The second part will discuss problems but also likely benefits of the new system of IP management that will take effect in April. It will also discuss other issues related to university-industry cooperation in Japan, particularly the contract research and the mobilization of human resources for research and development (R&D) relevant to industry.

## 2. Main change: National universities should own all IP

This change in legal status will result in universities being able to claim ownership over almost all discoveries made by their faculty members; similar to the case of US universities since the 1980 Bayh-Dole amendments to US patent law. The main legal basis for universities asserting this right will be that, as administratively independent corporations, the relationship between faculty and their universities will be an employee-employer relationship. Under article 35 of Japan's Patent Law, Japanese universities will have at least a non-exclusive license to work-related inventions by their faculty, and implicitly they will have the right to require assignment of all work-related inventions, provided the inventors are given "reasonable remuneration." According to a policy set forth in 2002 by the Ministry of Education, Culture, Sports, Science and Technology (MEXT 2002),[3] the new national university corporations should receive title to all work related inventions made by their faculty. Later in Part 2 of this article I analyze the meaning and implications of these changes. However, I will first summarize the old (and still current) system.

## 3. The "old" system of technology transfer

As described in detail in another publication (Kneller 2003a), national universities are simply branches of MEXT and their faculty members are civil servants. Ownership and management of inventions are governed by a complex array of laws and administrative guidance documents (the latter are often called "tsuuchi" in Japanese). The net effect of these is that ownership rests either with the inventor or with the national government, depending upon the source of funding under which the invention arose. The inventor can retain ownership if the invention arose under the general research allowance each professor receives (in Japanese, kouhi) or under "donation" funding (in Japanese, kifukin) from a company. On the other hand, the inventor must transfer ownership to his university, *as representative of the Japanese Nation*, if it arose under project specific government funding, that is under:

(a) MEXT Grants-in-aid (kakenhi); or

(b) commissioned or joint research (jutaku or kyoudou kenkyuu)

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1. Private universities that conduct significant R&D include Keio, Waseda, Ritsumeikan, Nihon and Sophia Universities and several private medical centers. These are not the focus of this article. The same is true for a small number of local government universities. However, the Japanese Government's program to support the establishment of Intellectual Property Headquarters (described in section 4, below) does include some private universities, including the first four mentioned above, and a few local government universities.

2. In Japanese, "kokuritsu daigaku houjin" a form of "dokuritsu gyousei houjin." The main law establishing the legal basis for this change is the National University Corporation Law (Kokuritsu daigaku houjin hou) which will come into effect on 1 April 2004.

3. MEXT is the official English abbreviation. The official Japanese name is Monbu-kagakushou. Prior to 2001, in which year the Japan Science and Technology Agency was incorporated by merger, the official Japanese name was Monbusho, which was also commonly recognized in English.

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sponsored by a government ministry, or one of the public investment corporations affiliated with various ministries.

Even an invention arising under industry-sponsored contract research (i.e., industry sponsored commissioned or joint research) is classified as arising under project-specific government funds because these monies must be passed through the Ministry of Finance before they reach the universities.[4]

Patenting and licensing of university/government owned national inventions is usually the responsibility of the Japan Science and Technology Corporation (JST) a MEXT-affiliated organization. Until April 2002, JST would only issue non-exclusive licenses. It charged low royalties for these licenses and probably has never initiated a patent infringement suit. In other words, JST followed a policy of dedicating all national inventions to the public.

In contrast, if the inventor retains ownership, he manages the invention without obligation or restriction. Before the advent of TLOs, the vast majority of inventor-owned inventions either were never developed or information about them was passed informally to companies, which *at their discretion* apply for patents, develop and commercialize, and pay token royalties to the inventors. (Some well known inventors will file patent applications themselves and then assign their rights to companies.) The companies that receive such information (or assignments) are usually companies:

(a) with which the inventors have informal consulting relationships (paid or contractual consulting relationships were prohibited until passage of the 2000 Law to Strengthen Industrial Technology);[5]

(b) that hire the inventors' students; or

(c) that give donations (kifukin) to the inventors. According to administrative guidelines, "donations" are untied gifts.

In reality, however, they are compensation for consultation, the main source of corporate sponsored research funds, and money given in expectation that the donor will receive future intellectual property rights. Because:

(a) it is easy to misattribute funding sources (professors' claims in this regard are rarely questioned);

(b) inventors prefer to retain ownership;

(c) inventors and companies do not have confidence in JST's ability to patent or promote development of inventions; and

(d) companies prefer to have exclusive ownership rather than just the non-exclusive license they could obtain from JST, many inventions that arise primarily from publicly funded research are misattributed to donation funding.

What proof exists for this assertion? Because the reporting requirement for university inventions varies between universities and is simply not enforced in some universities, data on total number of university inventions must be estimated by various means. Also, once an invention is considered to be inventor-owned (and in some universities, the inventors themselves are allowed to make this determination), there are no routinely collected data on the fate of such inventions. Nevertheless, data from a few universities, a few surveys, and conversations with faculty members suggest that inventors retain ownership of at least 90 percent of university inventions, even though the proportions of the various funding sources suggest that the inventors should retain ownership to only 25 to 60% of university inventions.[6] Moreover, a significant proportion of the approximately 10% of inventions that are designated as national inventions arose under industry-sponsored contract research and are co-owned by the sponsoring companies. In such cases, the industry sponsors usually manage patent applications instead of JST (see note 4), (Kneller 2003a).

In other words, although the Government should own and manage approximately half of all inventions, the actual percentage of inventions that are held to be in the government owned and managed category is very small. Avoidance of the "national invention" classification by misattribution of funding sources and informal, undocumented transfers of discoveries to the private sector has been commonplace and, by all indications, officially tolerated. In light of:

(a) delays in reviewing invention disclosures in universities;

(b) widespread lack of confidence in JST's ability to ensure that patent applications are well drafted and vigorously pursued;

(c) the inability of JST until 2002 to issue exclusive licenses in the case of inventions requiring further development; and

(d) widespread doubt about JST's ability to find good licensees, this "bending of the rules" has undoubtedly benefited Japanese industry.

But as a consequence, companies that give donations appropriate a significant proportion of publicly funded research results with no development obligations. These

4. However, a private sponsor of commissioned research can (and usually does) negotiate in advance for co-ownership with the university. A private sponsor of joint research usually can name one of its scientists as a co-inventor. Therefore, in the case of privately sponsored contract research, ownership is usually shared between the university/nation and the sponsor. Under Japanese Patent Law article 73, the consent of each co-owner is needed for any assignment or license to a third party. Therefore the private sponsor does not have to worry about the government transferring its rights to a competitor, but on the other hand, the sponsor usually needs high-level ministerial approval to license its rights in the course of business relationships, (Kneller 2003a).

5. In Japanese, Sangyou Gijutsu Roku Kyouka Hou (Law No. 44 of 2000).

6. The 60% upper estimate assumes that all "kou-hi" funds are available for research. From my personal experience, the majority of such funds are not available for discretionary research expenses, having been pre-allocated to various overhead costs.

companies tended to be large, established companies which had the means to give donations to many professors and offer their students attractive employment. Also there were no incentives for "champions" of university technologies to arise—individuals or organizations with incentives to try to ensure that promising inventions were developed to the point where their commercial potential would be apparent to established companies that would complete commercialization. Thus, the vast majority of publicly funded inventions in Japanese national universities were either:

(a) not developed;

(b) exclusively appropriated, without development obligations, by large companies; or

(c) noticed and used by the private sector but only after diffusion through the scientific literature and other open processes.

Even inventions that were industry sponsored were passed to their sponsors without development incentives.[7]

Three significant reforms have begun to improve this situation, the first dating from 1998. In that year with passage of the Law to Promote Transfer of University Technologies (also known as the TLO Law),[8] the government began to encourage the formation of technology licensing organizations (TLOs). This law did not change the basic ownership of university inventions, and TLOs can only manage inventions that are inventor-owned—unless permitted by senior authorities in the central government or unless JST gives a TLO an exclusive license to a national invention with sublicensing rights. (Since JST changed its policy in 2002 to permit this, JST has issued four such licenses to TLOs as of the end of 2003.)[9] Also, TLOs only manage inventions that inventors voluntarily assign to them.

The number of TLOs approved to receive government subsidies now stands at 36. The cumulative number of Japanese patent applications as of the end of 2002 for the 28 TLOs approved by that time was 2,945 (1,238 were filed in 2002 alone) of which 58 had issued as patents. The total number of PCT applications was 540 (287 filed in 2002 alone) of which 20 had been approved in at least one foreign country. The total number of royalty earning licenses and options was 420 (218 concluded in 2002 alone). Cumulative royalties earned was 797 million yen (~7 million USD) of which 343 million yen (~3 million USD) was earned in 2002 alone.[10] The overall picture is, not unexpectedly, of uneven progress among the TLOs, with those in existence longest and representing more prestigious universities generally being leaders in terms of patenting and licensing.

Most TLOs affiliated with national universities are independent for-profit corporations. If they were instead offices within their universities (as is the case of most US TLOs), they too would be simply offices within MEXT, and their staffs would be MEXT civil servants who must rotate jobs every two years like other administrative personnel. In addition, such TLOs would be prohibited from accepting outside funds and distributing them within their universities. Thus most TLOs were formed as independent for-profit companies (or in some cases as foundations affiliated with their universities) in order to be able to hire persons with relevant outside experience at competitive salaries and to return royalties to the universities (which they do as donations).

So the advent of TLOs, handicapped as they are, offers real hope that inventions requiring further development will have a champion, that is, they will be transferred to companies that are able to develop them and committed to their development. Conversations with managers of the more successful TLOs suggest that they routinely include due diligence clauses and royalty provisions in exclusive license contracts. Moreover, while faculty cooperation is still a universal problem, progress is being made in this area, too. A few TLOs are applying for over 100 patents per year, which in itself suggests a fairly significant degree of faculty cooperation.

The second significant reform, the advent of transparent consulting brought about by the 2000 Law to Strengthen Industrial Technology, has already been mentioned above.

The third major change is the explosion in the number of university start-ups that began soon after the 1998 TLO law, but acquired momentum after enactment of the 2000 Law to Strengthen Industrial Technology. This law, in addition to permitting paid consulting under certain conditions, allowed university researchers to hold management positions in companies, if such activities are directed to commercializing their university discoveries. In a country still characterized by lifetime employment with seniority based wages and retirement benefits (including in academia), and where leaves of absence are extremely rare, this removed the draconian choice facing university faculty who had committed themselves to academic careers but were also interested in entrepreneurial work. By mid 2002, approximately 450 university start-ups had been formed, about half from national universities (Tsukuba University 2003). Although most have neither sales revenues nor private venture capital financing, an increasing number do, and the number of initial public offerings

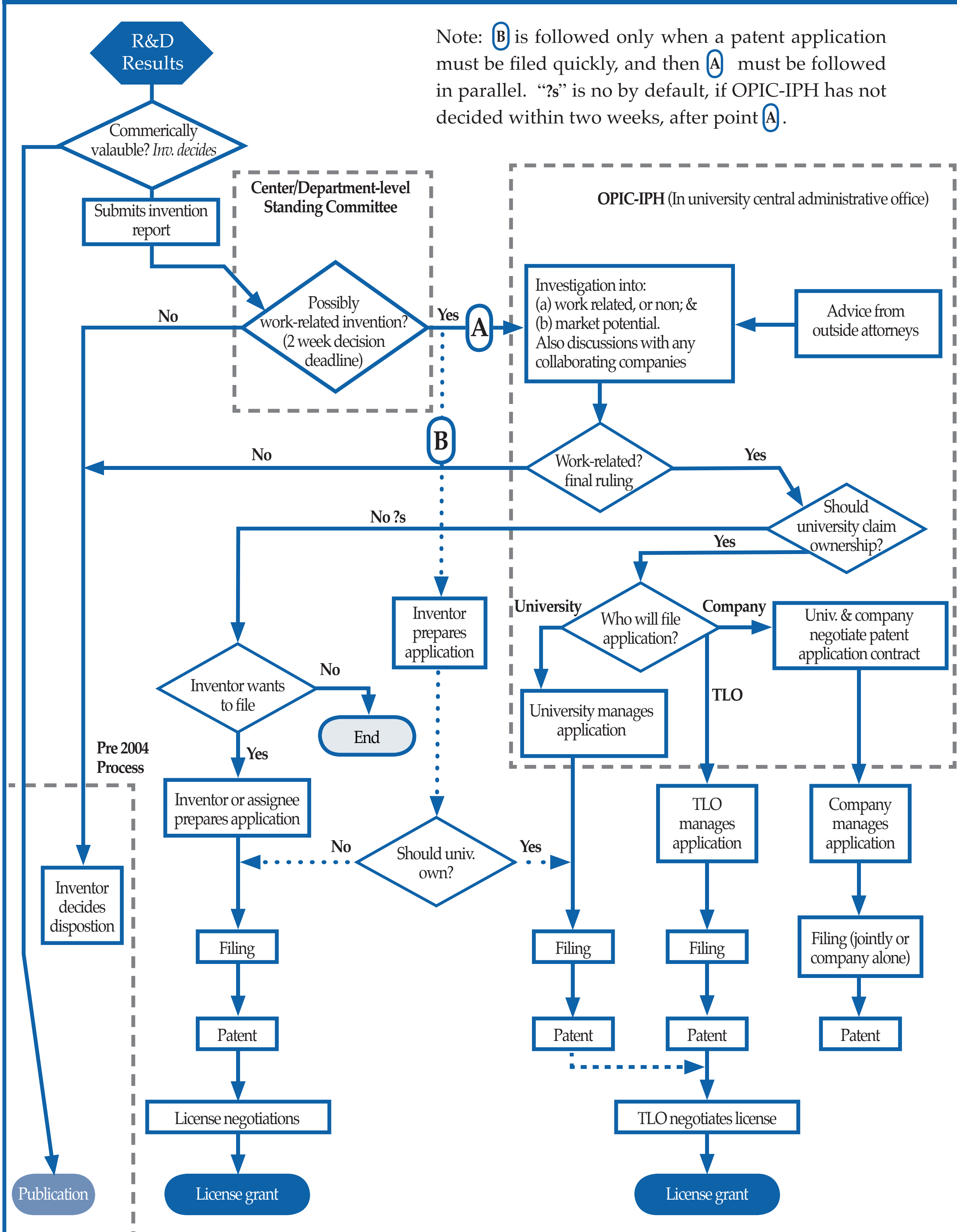
7. Because, as noted below in section 5 and in Kneller 2003a, sponsored research funds cannot be used to supplement faculty salaries and it is difficult to use such funds for personnel costs, even these inventions are substantially supported by sources other than the industry sponsor.

8. Law No. 52 of 1998. The original Japanese title, Daigaku nado ni Okeru Gijutsu ni Kansuru Kenkyuu Seika no Minkan Jigyou e no Iten no Soku-shin ni Kan-suru Hou, was shortened in 2000 to Daigaku nado Gijutsu Iten Sokushin Hou.

9. Personal communication from JST, 12 Dec. 2003.

10. Data are from METI. The MITI data do not break down license revenues among the TLOs, but they do break down data for numbers of patents and licenses. These are shown in Kneller 2003a.

## IP Flow and Management in Japanese Universities




Source: Working group reports from various universities and discussions with planning committee members.

(IPOs) is showing an accelerating trend. Among new biomedical companies, there was one IPO in 2001, two in 2002 and four so far in 2003. The founders of two of these companies are university faculty (in one case, recently retired). Probably only one independent biomedical company had an IPO prior to 2001—this occurred in 1996. TLOs sometimes are involved in licensing the inventor's/founder's key inventions to the start-up, but one survey suggests that about 85% of technology based start-ups are still formed by direct transfer of IP rights from the inventors to the start-up (Nikkei Weekly 2003).

R&D focused start-ups still face enormous challenges, including scarcity of competent managers, difficulty in attracting investors who can assess their technologies and offer ongoing help in helping their businesses to grow (i.e., smart capital), and rivalry more often than cooperation with established companies.[11] Nevertheless, I believe that the rise of such companies is one of the most important developments for Japanese technology and business, because these companies offer an alternative to the in-house laboratories of established corporations as loci for early stage innovation and initial development of university discoveries (Kneller 2003b, Ibata 2004). However, university inventors may now be too enthusiastic about forming new companies to develop their inventions, some of which would probably be best licensed to established companies.

As for the uncertainty about ownership of IP rights that are passed to start-ups ostensibly as inventor-owned discoveries, concern seems to vary. Not unsurprisingly, those companies that are seeking foreign investment seem to be most concerned. My own assessment is that these concerns are valid, since a future infringer could claim that, based upon the likely source of funds that lead to the invention, ownership should rest with the government, and therefore the start-up or its licensee has no standing to prosecute an infringement suit., (see Kneller 2003a).

11. See Kneller 2003b with respect to the tendency of established companies to rely on in-house laboratories for new technologies, and Ibata 2004 with respect to the tendency of established companies to seek to monopolize the output of small companies.

## 4. Rationale for the new system

Against this background, allowing the new university corporations to claim ownership over all their researchers' inventions, regardless of funding source, has the following advantages, at least in theory:

(1) It eliminates uncertain over ownership of university discoveries and allows for a clear chain of title from university to the companies that will ultimately commercialize the discoveries. Such a clear chain of title should be particularly helpful to start-ups seeking private capital.

(2) It eliminates the problem of inventors not transferring their discoveries to TLOs or transferring to TLOs only their less attractive inventions (in other words, the problem of TLOs being starved of good inventions to manage).

(3) Inventions should be more rationally managed—in other words, the TLOs should be able to make an informed decision which inventions are best managed by non-exclusive licensing, exclusive licensing, forming a start-up, or simply open publication.

(4) In the case of an exclusive license, the TLOs should be able to select a good licensee and include reasonable development incentives (due diligence clauses and/or periodic royalty payment obligations) in the license agreement.

However, because many of the TLOs are private corporations legally and administratively separate from their universities, university ownership will not necessarily mean the TLOs will manage these inventions. Also, despite recent progress, the ability of many TLOs to make expeditious, rational technology management decisions is still doubtful.

*End of Part 1. To be continued in Part 2, in the next issue of les Nouvelles.*

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