

### 3 Management and Utilization of Intellectual Property at Universities

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*Steady progress has been made so far in the development of systems for the management and utilization of intellectual property (IP) at universities. However, if we regard IP activities as constituting an intellectual creation cycle that starts from creation and leads to protection and utilization, we must say that IP activities at universities are still in the process of nearly finishing the first stage of the cycle.*

*For the future, universities should gradually shift from the first stage, of raising their awareness of IP and filing applications, to the second stage, of obtaining useful rights and licensing technology, while establishing systems and operations for carrying out IP activities on a medium and long-term basis.*

*To this end, it is necessary to further advance IP-related organizations, and from a more practical perspective, it is also necessary to identify and examine specific problems that occur in IP activities, with the aim to increase the effectiveness of IP activities.*

*This committee is organized with people engaged in pioneering IP activities and activities for industry-academia collaboration at universities. The committee members reported the ongoing initiatives and future visions at their universities, and held discussions on various issues with expert members from the legal and industrial communities.*

#### I Introduction

Steady progress has been made so far, through joint efforts of the public and private sectors, toward establishing systems for the management and utilization of intellectual property (IP) at universities, with the aim to spread and make use of research results. A number of universities have established IP departments and formulated IP policies and other related rules, raising their awareness of IP significantly and filing more patent applications with respect to research results.

However, if we regard IP activities as constituting an intellectual creation cycle that starts from creation and leads to protection and utilization, we must say that IP activities at universities, which have thus developed, are still in the process of nearly finishing the first stage from creation to protection.

For the future, universities should gradually shift from the first stage of raising their awareness of IP and filing applications to the second stage of obtaining useful rights and licensing technology, while establishing systems and operations for carrying out IP activities independently.

When discussing practical issues in an effort to sustain IP activities at universities, we should, above all things, take into consideration the essential role of universities as research institutes for educational and academic purposes. In other words, the basic principle of IP activities

at universities should be that universities must carry out IP activities without jeopardizing their essential role as educational and academic research institutes, and results from such activities must be used to further improve the educational and research environments at universities.

Also, considering that IP activities at universities largely depend on the size and regional characteristics of each university as well as its internal research organization, it is important to encourage universities to take independent measures based on their individual characteristics, rather than unifying their activities into a standard model.

It is also necessary to define the significance of IP activities at universities broadly and to evaluate the results of such activities from various perspectives. Since the original purpose of IP activities at universities is to spread and make use of research results, universities should not aim only at increasing the number of applications or rights. However, it is also questionable to regard IP activities at universities as profit-seeking activities, having excessive expectations on royalty income.

Basically, IP activities at universities, when carried out as part of activities based on industry-academia collaboration, will contribute to both the universities themselves and society in various ways. For instance, the following issues can be included in the scope of significance of IP activities at universities: stimulate research

activities within the university; provide opportunities to conduct practical education and research; acquire a higher reputation in society by spreading research results made by the university throughout society; develop human resources well versed in IP; and achieve regional development through the vitalization of industry.

While universities themselves are required to recognize such aspects of IP activities, we should make efforts to build internal and external support systems to help them carry out IP activities sustainably and independently.

## **II Initiatives toward IP Management and Utilization at Universities**

### **1 Current status and problems of IP management and utilization: Tohoku University**

Upon incorporation, Tohoku University decided that IP arising from research results achieved in the university should belong to the university. An important factor in IP management at a university is whether the university can use its IP as a support tool to increase its research ability and educational ability.

Based on its policy on industry-academia collaboration, Tohoku University is now working toward building a framework in which it can exert its strength as a comprehensive university. As the primary principle for obtaining and utilizing IP, the university pursues "utilization in society," which means that it aims to carry out IP activities so that its IP will not remain as dead stock but will be widely used at home and abroad.

Tohoku University has made achievements in its IP activities to date; the IP management system that it has established is capable of dealing with the amount of operations expected before incorporation, with 483 inventions reported and 313 applications filed in FY2004. The number of inventions reported in FY2005 increased over the previous year, which suggests that the university is nearly finishing developing its IP management system. One characteristic of Tohoku University's IP activities is that the university is striving toward the high goal of exploring how to enable both external TLOs and universities to exist and prosper together.

Problems facing Tohoku University in IP management and its responses are discussed below, focusing on the following five tasks.

(i) Develop the understanding of IP activities within the university and build a support

system

(ii) Strengthen collaboration between the university and TLOs

(iii) Formulate IP strategy with emphasis on IP utilization

(iv) Promote joint research and contract research

(v) Establish operational procedures for trade secret management within the university

Having established the Office of Research Promotion and Intellectual Property in September 2003, Tohoku University held repeated discussions, and integrated the office into the New Industry Creation Hatchery Center (NICHe) in Aobayama in June 2005, so as to strengthen its functions to promote IP management and industry-academia collaboration. Currently, various activities are being carried out through concerted efforts of the Development Planning Department (first floor), the Research Promotion Department, the Intellectual Property Department, the Industry-Academia Collaboration Division of the Research Cooperation Department, and the TLO (second floor). Also, with the objective to further enhance the university's functions to encourage industry-academia collaboration, the Council for Promotion of Industry-Academia Collaboration will be established in April 2006 as an organization where all functions to encourage industry-academia collaboration within the university will be concentrated, with the university's executive vice president for research taking the chair.

After three years' progress in the project for the development of the intellectual property headquarters, it is about time for Tohoku University to launch the formation of an original IP management model. In order to develop an IP management model applicable to an incorporated university, Tohoku University is working toward establishing a system to enable the university itself to own and manage IP, and strategically implementing the creation, management, and utilization of IP, while considering the possibility of achieving financial independence after the completion of the modeling project.

Efforts should be made to ensure effective use of the capabilities of individual organizations through restructuring, and to identify problems correctly and take appropriate action.

## **2 Initiatives for Industry-Academia Collaboration: Tokyo University of Agriculture and Technology**

The Center for Innovation and Intellectual Property (CIIP) was born from the Cooperative Research Center established in FY1988, through reorganization when the Tokyo University of Agriculture and Technology was designated for the project for the development of the intellectual property headquarters by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in FY2003, and it was incorporated in FY2004. The CIIP has an incubation facility and a venture business laboratory. As a result of this organizational reform, comprehensive and strategic measures were implemented to encourage industry-government-academia collaboration and to promote the creation, protection, and utilization of IP with the maximum use of external human resources. In August 2005, the university's Intellectual Property Headquarters was designated as the Super Industry-Government-Academia Collaboration Headquarters. Now the university has finished building a foundation to further contribute to the development of the Japanese economy and society by promoting joint research systematically and acquiring competitive research grants actively.

The Super Industry-Government-Academia Collaboration Headquarters was established as the strategic headquarters for industry-government-academia collaboration in cooperation with the Institute of Symbiotic Science and Technology, with the CIIP playing a core role, and the university's president serving as the chief.

IP liaison staffs are mainly engaged in matching external needs with internal resources for the purpose of discovering and creating demand for joint research and contract research. Research coordinators are assigned to each section or office of the Innovation Division in order to provide continuous support for various research activities such as selecting themes of applied research from the results of basic research, making arrangements for joint research, obtaining rights for research results, and promoting joint research and technology licensing arising from patents. The IP Division is engaged in the creation and acquisition of IP, information management, technology licensing, and education. The Office for Regional Collaboration works, in cooperation with the IP Division, to promote collaboration with the national and local

governments and acquire agreements for joint research and contract research. The Coordination Office for Comprehensive Strategy develops activity strategy and coordinates activities of the center as a whole. The Contract and Administration Office is in charge of providing support for research and handling administrative work relating to industry-academia collaboration and contracts.

In the field of industry-academia collaboration, the CIIP is engaged in liaison, the creation of joint research, incubation, technology licensing, IP activities, and human resource development. TUAT TLO Co., Ltd., takes charge of technology licensing under contract with the university.

## **3 Initiatives for Industry-Academia Collaboration and IP Management and Utilization: Tokyo Institute of Technology**

Points and features of the initiatives for industry-academia collaboration and for IP management and utilization at the Tokyo Institute of Technology are as follows.

(1) After incorporation, the institute changed its principle for dealing with IP so as to attribute IP to the institute. As a basic policy for industry-academia collaboration and for IP management and utilization, the institute has advocated a model for industry-academia collaboration with emphasis on joint research, which is centered on the "IP-based intellectual creation spiral," and has established a framework and carried out various activities in accordance with this model.

(2) The institute established the Office of Industry Liaison (OIL) as a central organization for industry-academia collaboration and for IP management and utilization. The OIL was headed by the institute's Executive Vice President and operated by more than 50 employees recruited from outside the institute.

A division specialized in handling contractual affairs relating to joint research and contract research was established within the OIL, which set a precedent for other universities and institutes in Japan.

About 500 inventions and 600 research contracts that occur each year were all handled by the OIL in a centralized manner instead of individual divisions concerned, so as to ensure consistency in operation throughout the institute. More than ten coordinators play an important role in going between companies and teachers.

(3) The principle of attributing IP to the institute has been established within the institute, and IP

awareness among teachers has increased to a satisfactory level. The OIL entered into a service support contract with the Tokyo Institute of Technology TLO, and has been implementing the whole process of IP management and utilization (selection and evaluation of inventions, filing of applications, and licensing) through close cooperation. In this process, the institute itself is in charge of selecting and evaluating inventions and filing applications, while entrusting licensing activities, such as marketing the institute's patents and coordinating contract terms with partner companies, to the TLO that has abundant experience and expertise in this field.

(4) According to the model for industry-academia collaboration with emphasis on joint research, the institute proceeds with various projects for research cooperation with companies. It has developed an original prototype for joint research and contract research through active efforts for improving research systems, and made flexible arrangements to coordinate contract details.

Furthermore, the institute has launched a new initiative to promote systematic collaboration with industry. Currently, it carries out large joint research projects based on collaboration with manufacturing companies, and also plans and promotes large joint research projects based on collaboration with non-manufacturing companies (e.g. trading companies). It also works to promote collaboration with SMEs and local communities and supports venture companies.

(5) For the future, the institute aims to improve services for companies by drastically enhancing its liaison functions, and makes preparation in order to integrate the TLO's licensing functions into the OIL in FY2007.

#### **4 Initiatives for IP Management and Utilization: University of Electro-Communications**

The Intellectual Property Office of the University of Electro-Communication was established in August 2003 with financial support from the government, and since then, it has been working toward achieving effective protection and utilization of the university's IP, in cooperation with the university's TLO, Campus Create Co., Ltd.

Basically, the Intellectual Property Office, as an internal organization, takes charge of obtaining rights, while the TLO, as an external organization, takes charge of licensing the university's

technologies and rights. However, on a case-by-case basis, the office and the TLO cooperate with each other in selecting inventions and licensable technologies.

About one year after the establishment of the office, the university had almost finished developing its IP management system. The question that still remains is how to increase the value of IP and achieve effective management and utilization of IP. After two and a half years having elapsed since the establishment of the office, the university should now get back to its basic mission and tackle this question, which also involves various issues within the university, such as activities for raising IP awareness, education for inventors, TLO functions, reorganization of the IP management and utilization system, and fund raising. Taking these issues into account, the university has started discussion toward system improvement for the next stage.

In the main text of the study report, we discussed the outline of the Intellectual Property Office of the University of Electro-Communication, the current status and problems in the three stages of the project, and the measures and policy for the future.

We also addressed the issue of how to handle IP under joint research contracts between universities and companies, which posed a serious challenge to national universities after incorporation. The university reviewed its conventional format for a joint research contract and developed a new format in order to ensure flexibility both for universities and companies. With this new contract format, negotiations for joint research contracts have been expedited.

The new contract format has the following features: (i) the inventor shall basically be entitled to own rights for his invention; (ii) where the university solely owns rights, it shall grant right of first refusal (RFR) to the partner company; (iii) in the case of rights jointly owned by the university and the partner company, the company shall pay the university royalties as compensation if it exercises the rights exclusively.

Although the royalty issue still remains between the university and companies, it does not cause problems so frequently as before in negotiations, because both parties have well understood the reality of joint research and gained negotiation experience.

However, there are still many issues to be resolved in order for the Intellectual Property

Office to accomplish the university's basic mission and contribute to society.

## **5 Actual Situation and Problems of Industry-Academia Collaboration and IP Management and Utilization: Yamaguchi University**

At the halfway point of the project for the development of the intellectual property headquarters, we reviewed, in the main text of the study report, the achievements and characteristic initiatives at Yamaguchi University, and suggested important issues in IP management and utilization at universities, with our views on such issues.

Regarding the first subject of review relating to the "development of policy and regulations," we outlined (i) the existing regulations on employee's inventions and (ii) the current status of management of trade secrets, focusing on the importance of the use of "laboratory notebooks." The second subject relates to the "handling of IP and various contracts." On this subject, we made the following recommendations: (iii) the royalty issue should be resolved, and flexible joint research contracts should be concluded; (iv) labor cost for students who participate in joint research projects should be secured under joint research contracts; and (v) the university should demonstrate its originality when working with SMEs and venture companies. The third subject is the "future of the intellectual property department." For the next stage after the completion of the project for the development of the intellectual property headquarters, we discussed future tasks while taking into consideration (vi) the importance of viewpoints of IP business for universities and (vii) the relationship between Yamaguchi University and its TLO.

Next, we provided detailed explanations and example cases, focusing on the three important issues that not only Yamaguchi University but also many other universities would face in the future. The first issue relates to "responsible commitment of universities." In this context, we outlined (viii) the interest in "property" of universities, and then listed (ix) financial problems that should be noted when designing IP business models. We also pointed out (x) the importance of human resource development to be undertaken under the initiative of each university in a planned manner. Regarding the second issue relating to "management of trade secrets and

measures implemented by the university," we described the following representative measures actually implemented at the Yamaguchi University: (xi) improvement of the management system for trade secrets in relation to master's theses and graduation theses; (xii) recommendation of the development and use of "laboratory notebooks"; (xiii) management of trade secrets and a students' confidentiality pledge. The third issue is the "future of the intellectual property headquarters and the TLO." On this issue, we suggested five possible patterns of the relationship between these organizations, and briefly outlined characteristics of each pattern.

Throughout the section on Yamaguchi University, we stressed that "universities and institutes should be responsible for tackling various issues on industry-academia collaboration and IP." In particular, we pointed out the importance of formulating business plans and operational improvement plans quantitatively by grasping uncertain factors numerically, such as IP costs and the potential value of IP. We also stated that universities should formulate definitive plans for securing human resources. In the course of building an intellectual creation cycle based on these plans, it is necessary to deepen mutual understanding between industry and academia and encourage flexible responses and positive actions by both parties.

## **6 IP Management and Utilization: Kagawa University**

### **(1) Introduction**

Kagawa University started discussion on IP management and utilization in FY2002, and established and began operation of the Central Office for Creation and Transfer of Intellectual Property in FY2004. In this section, we consider a desirable framework for IP management and utilization that is suitable for regional small-sized universities, referring to the achievements made at Kagawa University in one year since the establishment of the central office.

### **(2) Organizational structure**

Kagawa University is a regional, small-sized university with only 300 faculty members in science and limited operational funds. For this reason, the university organized and operated the central office according to the following principles:

- Establish a small-sized office;

- Achieve and sustain balance between revenues and expenses relating to patents by carrying out basic IP activities, while aiming to benefit the university with patents that will produce huge profits;
- Establish a small-sized management system that is suitable for an assistance organization for a small-sized university after incorporation.

### **(3) Operation of the central office**

The basic principle for operating the central office, which was employed on a trial basis and established in FY2004, is to achieve a small-sized management system, by actively promoting joint efforts with companies to file applications for applied patents and transferring such patents to companies for profits.

### **(4) Examination and negotiation of research contracts**

The central office is also in charge of examining and negotiating research contracts. For the benefit of research personnel, Kagawa University aims to conclude research contracts that are characterized as follows: (i) know-how is excluded from the contract coverage; (ii) teachers are required to instruct students to keep confidentiality but are not held liable for breach of confidentiality by students; (iii) in the case of joint applications, each party's cost burden is not defined based on the party's share in rights; (iv) royalty is specified as price for inventions; (v) the prohibition period for making presentations on research results is long, and such presentations may be made only for a limited period.

### **(5) Expenses for the operation of the central office**

We simulated operational expenses that would be incurred five years from now when the operation of the central office would be close to being established. By striving to maintain the principles of (i) promoting active efforts to file joint applications with companies, (ii) selling out about half of joint patents to the partner companies, and (iii) setting the upper limit of the number of patent applications to be filed by the university independently each year to ten, the university will be able to achieve balance between revenues and expenses relating to patents, and will be able to sustain the operation of the central office.

## **7 Current Status and Problems of IP Management and Utilization, and Recommendations: Tokai University**

### **(1) IP management organization at Tokai University**

At Tokai University, the Head Office of Intellectual Property Management takes charge of management and utilization of IP in a centralized manner. The head office was established in the Shonan Campus and administers a union consisting of Tokai University, Kyushu Tokai University, and Hokkaido Tokai University.

### **(2) Development of IP-related organizations**

Since its establishment in 1946, Tokai University has engaged mainly in research, education, and social contribution, while placing emphasis on intellectual property, and now it has developed necessary IP systems and regulations and enhanced IP-related organizations through the process of trial and error. The following organizations are affiliated with the head office.

- (i) Comprehensive Research Center: comprehensive administration and coordination for IP activities, including research, industry-academia collaboration, and joint research
- (ii) Intellectual Property Committee: consultation on IP issues at the request of the head office
- (iii) Unified Education Committee, TIP Committee: development and promotion of educational plans for the unified education system from kindergarten to elementary school, junior high school, high school, and university.
- (iv) Tokai University Olympic: hands-on education to encourage intellectual creation in the university

### **(3) Activities relating to IP management and industry-academia collaboration**

- (i) Routine activities
 

By employing external IP experts as project managers, the head office aims to raise the speed and increase the quality of the IP management process, which covers the selection of inventions, filing of patent applications, and requesting of patent examinations. In the stage of patent utilization, the head office formulates contracts for licensing and joint research, and acts as an agent or provides support for negotiating with partners.
- (ii) Development of legal framework for IP
- (iii) Raising awareness of IP culture
 

The head office endeavors to develop IP

culture, which has been nurtured since the establishment of the university, and raises awareness of IP culture among not only research personnel and professors but also undergraduates and postgraduates.

(iv) Human resource development

In order to establish and further develop IP management at the university (creation, protection, and utilization) and industry-academia collaboration, it is necessary to foster experts proper to the university.

(v) Support for industry-academia collaboration

The head office promotes support for industry-academia collaboration in various fields such as science and engineering, medicine, health, and human resource development, while paying attention to the needs of companies and associations in each region.

(vi) Creation of an international network

The head office promotes the creation of an international network via the International Strategic Office.

#### **(4) Future tasks**

(i) Providing support to raise the overall research level

(ii) Shifting emphasis from quantity to quality in the process of filing applications and obtaining rights

(iii) Taking flexible measures in response to the increase in the amount of joint research and joint filings with companies, e.g. the introduction of research grants

(iv) Developing and making effective use of human resources

(v) Strengthening collaboration between the campuses and the three universities in the union that are scattered across the country

(vi) Strengthening collaboration with and contribution to local communities

#### **(5) Recommendations**

We recommend that the government's support measures for IP management and utilization at universities and for industry-academia collaboration should be reviewed in terms of selection of the entities eligible for grants, human resource development, and evaluation of achievements.

### **III Requests for National Universities from the Industrial Community in the Chugoku Region**

In November 2004, the industrial community

in the Chugoku Region released a report to present their requests in regard to the IP policies and contract formats developed by the five national universities in that region. The working group, composed of businesses in the region, presented 11 specific requests, focusing on issues on joint research contracts, which may have the greatest influence on them.

In the main text of the study report, we reviewed the background and outline of the activities of the working group (Chapter 1), and summarized the specific requests for the national universities based on the working group's report (Chapter 2). In Chapter 3, we made recommendations for national universities in local areas from the perspective of supporting and revitalizing local SMEs. In particular, among the specific requests presented in the working group's report, we focused on six requests that seem to be also applicable to national universities in other regions and are still significant today. The outline of each request is as follows.

#### **(1) Transfer of the right to file applications for joint inventions to companies**

Where inventions jointly created by a university and its partner company do not satisfy the university's filing standards or the university cannot afford to pay filing costs, the university should, at the request of the company, actively transfer its share in rights to the company. Suggestions were also made in regard to compensation for such transfer.

#### **(2) Preferential license**

With respect to the results of joint research, universities should not grant license to a third party other than the partner companies for a certain period; during such period, universities should grant an exclusive license to the partner companies at their request.

#### **(3) Royalty for jointly-owned IP**

Royalty should be paid in cases where universities do not use IP that they own jointly with companies, and such royalty should be paid from the profits that the partner companies have gained by using the IP. The amount of royalty should be calculated based on the amount of profits gained by the companies, while comprehensively taking into consideration various factors such as the existence of patent rights, the strength and importance of patent rights, the existence of other patents in use, and the degree of contribution of patents to profits.

#### **(4) Sharing of costs for joint applications**

It is questionable that companies bear the whole amount of costs for joint applications. Appropriate conditions should be established for cost sharing.

#### **(5) Flexibility of contracts**

Flexible arrangements should be made for joint research contracts. Specifically, contractual terms should be more diversified and each university's ability to handle contractual affairs should be improved.

#### **(6) Consideration to SMEs**

Universities should give consideration to SMEs that have poor experience in dealing with IP, by providing support on IP issues and contractual affairs and obtaining "informed consent" from SMEs.

### **IV Conclusion**

Looking at universities that have worked toward developing intellectual property headquarters and other IP-related organizations so far, we find that some of these universities falsely or insufficiently understand IP laws and other related regulations. In order to promote the creation and utilization of IP at universities, it is necessary to deepen their understanding of IP in general, including IP laws.

The Institute of Intellectual Property discussed the handling of IP at universities in two consecutive years since FY2004. In FY2005, based on the study results in the previous year, we examined the initiatives relating to IP taken by several universities.

The underlying concepts of this study can be summarized as follows: (1) IP activities at universities should be promoted, while taking into consideration the essential role of universities as research institutes for education; (2) in light of autonomy in universities guaranteed under the Constitution, individual universities should take the initiative in promoting IP activities; (3) IP activities do not always economically benefit universities; (4) IP activities should be promoted based on the understanding of each university as a whole, because such activities are not always intended to bring about economic benefits to universities, and they are likely to impose an economic burden on them.

It is impossible to promote IP activities at universities continuously without examining the current status of such activities based on the

basic understanding of universities and IP. This study report is written by people in positions of responsibility at the intellectual property headquarters of several universities, regarding the IP initiatives taken at each university. We hope that this report will be helpful reference material for universities to consider for their IP activities in the future.

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