Towards the establishment of consolidated culture for industrial property rights among university researchers in Mexico – lessons from the experiences in Japan

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Towards the establishment of consolidated culture for industrial property rights among university researchers in Mexico – Lessons from the experiences in Japan

Abstract

There are two main objectives of this work. The first one is to point out the different programs and strategies implemented by the Japanese Government and the Universities to foster industrial property rights in the university understanding the sequence and the reasoning of the whole strategy; the second objective is to understand the current state of awareness of industrial property rights among researchers in the Japanese Universities.

After 20 years of having started, the current situation reflects significant achievements, this work point out the general strategy of Japan for raising the importance of industrial property rights and focuses on the specific efforts of Japanese government and Universities for increasing the researcher's awareness of industrial property rights.

The methodology includes a review of the strategies implemented by the government and some universities in recent years to strengthen industrial property rights and also includes interviews to specialists on industrial property rights with broad experience working with inventors.

This work is structured as follows. At the beginning there is a previous work review, it is also analyzed some important data of industrial property rights. Then the methodology of this research is presented, this will consider the previous work and relevant industrial property data review (mostly based in English information available) and the information obtained from the interviews to intellectual property people from relevant Institutions in Japan. Finally, the analysis of the results, the conclusions and recommendations are presented. Please consider that the opinions in this work represent the personal point of view of the author.

Keywords

Awareness, Industrial Property Rights, University's Researchers

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List of Abbreviations

AIST- National Institute of Advanced Industrial Science and Technology

APIC- Asia-Pacific Industrial Property Center

COECYTJAL- State Council of Science and Technology of Jalisco

FY- Fiscal Year

GII- Global Innovation Index

GOJ- Government of Japan

IMPI-Mexican Institute of Industrial Property

IP- Intellectual Property

IPO- Intellectual Property Office

JIPII- Japan Institute for promoting Invention and Innovation

JPO- Japan Patent Office

JST-Japan Science and Technology Agency

MEXT- Ministry of Education, Culture, Sports, Science and Technology

OIST- Okinawa Institute of Science and Technology

OTL- Offices of Technology Licensing

R&D- Research and Development

SICyT-Secretary of Innovation, Science and Technology

SNI-The National Research System

TLO- Technical Licensing Organization

TMDU- Tokyo Medical and Dental University

TTO- Technology Transfer Office

UNAM- National Autonomous University

UNITT-University Network for Innovation and Technology Transfer

US- United States of America

UTokyo- The University of Tokyo

WIPO- World Intellectual Property Organization

Chapter 1 : Introduction

After the great recession in 1990s and following the strategy of the United States of America (US), Japan prioritized an economy based on knowledge; it focused on looking forward to creating an innovation culture and an intellectual property-based nation.

According to Idris & Arai (2006, p.10), an “innovation culture” is one in which innovation and creativity are valued and appreciated, adequately funded and channeled to specific needs. It is a key factor in a nation’s success in enhancing the well-being of society and creating wealth.

The innovation culture is closely related with the Intellectual Property (IP), which the World Intellectual Property Organization (WIPO) refers as the creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names, and images used in commerce.

WIPO assures that by striking the right balance between the interests of innovators and the broader public interest, the IP system aims to foster an environment in which creativity and innovation can flourish.

There are different stages in the cycle of intellectual property rights since the discover from the creativity until the innovation process; the Oslo Manual for measuring innovation defines four types of innovation: product innovation, process innovation, marketing innovation, and organizational innovation.

Different authors have studied the process of innovation and its different stages in various context, so the stages and implications may vary. However, there are elements in common which include at least three stages: creation, protection, and utilization.

In figure 1, it is shown a basic and clear representation of the creation cycle of intellectual property.

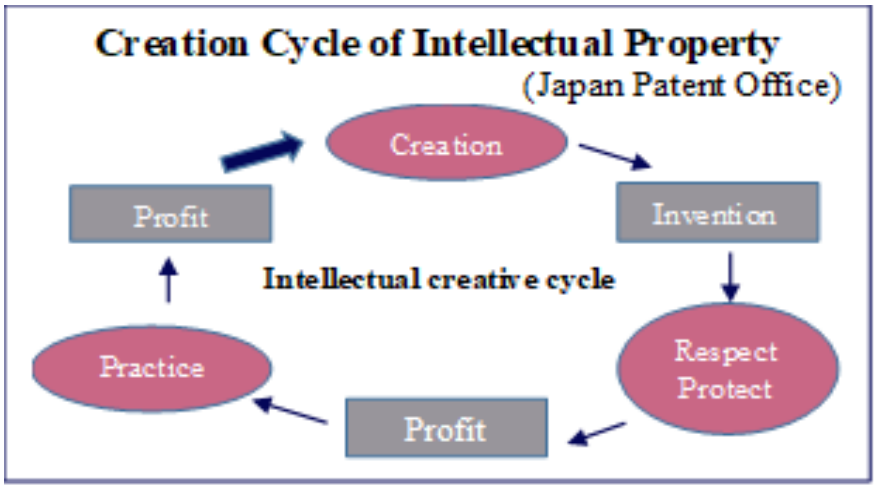


Figure 1. Intellectual property creation cycle.
Adapted from "Education, Dissemination and Raising the Awareness of Intellectual Property in Japan" by T. Ogiya, H. Uchida, T. Kimura, K. Sugimitsu and Ch. Tamura, 2018. Japan Patent Office. Asia-Pacific Industrial Property Center, Japan Institute for promoting Invention and Innovation, p.10. Copyright [2018] by the Japan Patent Office.

One of the most reliable indicators of innovation in a particular country or region is patenting activity. Patents are a key measure of the extent and success of an innovation culture. They reflect inventive performance, they can track the diffusion of knowledge, and they are good indicators of the level of internationalization of innovation activities. They can be used to measure the level of R&D activities, and ultimately, how effective those are, what structure they are taking, and which industries appear to be successful, and which not (Idris & Arai, 2006, p.13).

Therefore, having an innovative economy with valuable intangible assets is a pretty desirable goal. Scientific and technologic knowledge represent the opportunity to generate value. Universities have enormous potential to make contributions to this vital knowledge.

1.1 Problem consciousness and current understanding

Aligned with the objective of generating value, frontrunner Universities in this century pursue to fulfill the third mission; Universities should benefit society by transferring knowledge. There are two ways to do so, the most common way, through publishing in journals and through transforming scientific and technological research into marketable products or services.

Regarding the last form, generating inventions has achieved important relevance for the benefit of society but also since their commercialization could represent additional incomes for Universities. However, the lack of awareness of industrial property rights may be accompanied with some difficulties in the process of protecting and commercializing inventions.

In Mexico remains a lack of awareness of the protection of Industrial Property Rights for inventions developed by university's researchers. Among the factors that determine that there is a low culture of industrial property among university researchers and that consequently discourage the protection of inventions, the following are identified:

1) Lack of knowledge of industrial property rights field: Sometimes, the researchers do not know what and how to protect inventions, this lack of knowledge does not allow them to identify that they are developing value-added science and technology that may be susceptible to obtain protection by industrial property rights.

2) An Insufficient framework of incentives for the protection of industrial property rights: The main example refers to the National System of Researchers (SNI), whose objective is to recognize the work of people from Higher Education Institutions and Research Centers dedicated to producing scientific and technological knowledge. This system aims to differentiate the quality and prestige of scientific contributions, and provides economic benefits.

To participate in the benefits of this prestigious system, the academic records of each researcher are presented to be evaluated; it should be noted that each scientific contribution has a different value. The incentives obtained from the evaluating program represent prestige and additional income to the salary for the university´s research professors in Mexico. Usually, this system does not give value to a patent application and the patent registration, worth as the publication of an article in a scientific journal. This also happens with another evaluating program, as the "Program for the Improvement of Teachers (PROMEP)," which is another mechanism for evaluating academic performance in the country.

3) Insufficient recognition for develop an invention: In the specific case of patent applications, on average, it takes around four years to obtain a resolution (positive or negative) from the Patent Office, so the perception of the researchers is sometimes that the academic recognition for having a patent application is none or appears very late.

4) There are few examples of demonstration effect: This is related to the few cases that exist of researchers who obtain economic and academic benefits derived from the exploitation of science and technology protected through industrial property rights, but especially there are few cases of inventions being used in society for solving problems. In Mexico, there are low levels of university's technology transfer to the market, this can be due to multiple reasons, among them, inventions are still in very early stages of development (basic research), and large economic quantities are required to continue developing them. Also, there are not adequate valuation and technological promotion mechanisms, and there is a gap between the needs of the industry and the technological solutions developed by the researchers.

The preview could explain the low prevailing culture among university´s researchers to protect their inventions. It should be noted that to minimize the problem of the lack of a culture of protection of industrial property in Mexico, the Mexican Institute of Industrial Property and the universities have made some efforts. However, these efforts are mostly limited to advertising about the intellectual property rights in the media or forums, without concretely raising awareness of the importance that this field has not only in the academic scope but also in the positive impact it has for the society. These promotional efforts are reasonable, but not enough to mitigate the problem.

1.2 Justification of the study

Japan's commitment to the inventions is profound. It began in earnest when (then) Prime Minister Koizumi launched the national strategy for invention and IP in a policy speech to the Diet in early 2002. The previous resulted in the formation of the Strategic Council on Intellectual Property in March 2002. Sweeping reforms of Patent Law in general, amendments to the Patent Attorneys Law, and the new introduction of Patent Courts in 2005 are changes on a scale not seen since the beginning of the Meiji Era (Taplin, 2007).

Currently, Japan has a strong and integrated strategy for fostering the awareness of intellectual property rights in the country, and this strategy includes particular actions focused on increasing it at Universities.

Twenty years after having started, Japan has made important achievements, according to data from the International Monetary Fund (IMF) in 2018, Japan is the world's third biggest economy; Japan also ranks in the 13th position in the Global Innovation Index (GII). Nevertheless, the dissemination and raising awareness of intellectual property rights continues being an important component of Japan´s strategy to become an intellectual property based-nation.

The Japanese experience could be valuable for Mexico in the design of a comprehensive strategy to strengthen intellectual property rights in the country, as well as for universities to increase the awareness of industrial property rights among researchers.

1.3 Purpose of the study

This work aims to contribute for having a better understanding on the state of awareness of Industrial property rights among the researchers and professors in Japan; it will point out the programs and strategies implemented by the government and universities in Japan to strengthen and raise the culture of protection of inventions through industrial property rights. On the other hand, this proposal intends to identify some recommendations to foster awareness of industrial property rights in Mexican Universities.

1.4 Description of the study

This work starts from the question, how to raise the awareness of industrial property rights among university's professors and researchers? In the intend of answer the question, the methodology of this work includes a review of the strategies implemented by the government and some universities in recent years to strengthen industrial property rights and also includes interviews to specialists on industrial property rights with broad experience working with researchers.

For the purpose of this study, it is important to define what would be considered as the awareness of industrial property rights among university researchers. According to the

Oxford dictionary, awareness is defined as the “knowledge or perception of a situation or fact.”

The World Intellectual Property Organization (WIPO,2016) appoints that industrial property takes a range of forms, these include patents for inventions, utility models, industrial designs (aesthetic creations related to the appearance of industrial products), trademarks, service marks, layout-designs of integrated circuits, commercial names and designations, geographical indications and protection against unfair competition.

In this study the awareness of industrial property rights among researchers should be considered as the knowledge and perception of the creation cycle of intellectual property process, from the creation and discover to the utilization, focusing on the awareness of university’s professors and researchers, regarding the understanding of industrial property rights, specifically patents, utility models and industrial designs.

1.5 Expected findings

It is expected to find a strengthened regulatory framework, as well as mechanisms that have allowed universities in Japan to promote among their researchers a culture of IP that privileges the protection of inventions.

The Japanese experience could be valuable for Mexico in the design of a comprehensive policy to strengthen intellectual property rights in the country, as well as for universities to increase the awareness of industrial property right among researchers.

Chapter 2 : Basic Information and previous studies

2.1 Framework's overview of the main governmental actions to foster industrial property rights in Japan and the support programs for Universities

This section includes a brief description of the different strategies implemented by the Japanese government to strengthen and promote industrial property rights in the country; the purpose of this section is to highlight those strategies which directly consider and benefit the Universities paving the route to foster the industrial property rights.

2.1.1 Act to Facilitate Technology Transfer from Universities to the Private Sector

In 1998, the Act to Facilitate Technology Transfer from Universities to the Private Sector was elaborated, the purpose of this Act was to contribute to facilitation of the transformation of our national government's industrial structure, to the sound development of the national economy and advancement of learning, as a result of efforts to develop new fields of business, improve industrial technologies and revitalize research activities at universities, national colleges of technology, inter-university research institutes, and national research and development institutes, etc. through measures to promote the transfer of research results related to technology to the private sector (Act to Facilitate Technology Transfer from Universities to the Private Sector,1998).

This act started in 1999 as one of the first efforts aimed at promoting the transfer of research outputs to the industry, in this act were contemplated the Universities, including the national colleges of technology and the inter-university research institutes. As a result of the Act and the different programs that followed, more Offices of Technology Licensing (OTL) were set up in the Japanese Universities. However, it should be noted that before this act took effect, in 1996, Mr. Takafumi Yamamoto had already established the business model of ¨TODAI OTL¨ of the University of Tokyo after gaining insight into technology licensing at universities through a consultation contract with Niels Reimers, a pioneer of the model of technology transfer and founder of the Stanford University Office of Technology Licensing (E. Lee, personal communication, June 30, 2016).

2.1.2 The Bayh-Dole Act in Japan

To accelerate the transfer of technology from the Universities, in 1999 and with a difference of 20 years from the United States, Japan adopted the Bayh-Dole Act in its version called The Act on Special Measures for Industrial Revitalization.

Hatori (2016, p.8) refers that the Act has allowed universities to own the right to obtain the patents for results from research on competitive research funds granted by the government, giving big incentives to inventors. As this Japanese version of the Bayh-Dole Act requires universities to manage on their own patent applications for inventions created with government-granted competitive research funds, the universities have established an internal organization that takes charge of patent filing and patent right management.

2.1.3 IP Basic Act, IP Strategic Quarters and IP High Court

One of the anchoring points of the university reform was the Toyama Plan, 2001, named after the Minister for Education, Culture, Sports, Science and Technology (MEXT) Atsuko Toyama. This plan proposed three major reforms: the reorganization and incorporation of national universities, the development of universities that conform to the highest international standards by using third party evaluation, and increasing the proportion of competitive funding (Harayama & Carraz, 2008, p.96).

In order to achieve those three reforms, in 2002, MEXT organized a public consultation with experts from companies, universities, and other expert people, the consultation results were published in a report. This report was reflecting the changes in circumstances surrounding universities and the policy announced by the Japanese Government on national intellectual property strategies, the Working Group redefined university missions. It made clear that the contribution to society by commercialization of university inventions is one of the missions for Japanese universities. University's professors must contribute to this mission through, not only development of inventions but also protection and commercialization of their inventions (Takenaka, 2005, p. 31).

With the consultation results, MEXT leads to established in 2002 the Intellectual Property Basic Act which specifically established the new mission for Universities in its Article 7 (2002, p.3):

> (1) Universities, etc. shall, in light of the fact that their activities are contributing to the creation of intellectual property in the whole society, endeavor voluntary and positive to develop human resources, disseminate research and the research results.
>
> (2) Universities, etc. shall endeavor to assure proper treatment of researchers and engineers and to establish and improve research facilities so that the duties and working environments of such researchers and engineers will be attractive and suitable for their importance.
>
> (3) In formulating and implementing measures for the creation, protection and exploitation of intellectual property pertaining to universities, colleges of technology and interuniversity research institutions, national government and local governments shall consider the respect for researchers' autonomy or other characteristics of the research that is carried out at universities, colleges of technology and interuniversity research institutions.

Hence, from the standpoint of intellectual property management, Japanese universities pursue three goals, such as 1) Creation of Intellectual property, 2) Protection of Intellectual property, 3) Exploitation of Intellectual property. Practically, these goals are achieved by a number of activities: implementation of commissioned and joint research, examination of new inventions, patent application, and management, technology transfer through licensing and marketing, support to start-up companies, managing consulting activities of faculty members, dealing with conflict of interests (Takahashi & Carraz, 2009).

After the Intellectual Property Basic Act was enacted, in 2003, through a Strategic Program and in accordance with Chapter 4 of the Act were established the Intellectual Property Strategic Quarters. The Headquarters executed the national strategy by developing a program for promoting creation,
protection, and exploitation of intellectual property; listing action plans; and reviewing the execution of such plans by ministries and agencies (Takenaka, 2009, p.382).

The Strategic Program also assisted the establishment of Intellectual Property Headquarters at Universities, which strategically engages in creating, acquiring, managing, and exploiting the intellectual properties under their charge (Arai, 2005, p.6). Currently, the Quarters are closely involved in creating the strategic intellectual property program each year, as well as providing a report of the results of the policies and future actions to be taken.

Corresponding with promoting and supporting the intellectual property strategy, in 2005 was a relevant change in the Japanese Court System, it was established the Intellectual

Property Tokyo High Court which deals with any and all IP cases including certain IP cases being subject to the exclusive jurisdiction of the Tokyo High Court (appeals of patent-related litigations, suits against appeal/trial decision made by JPO) as well as the cases concerning the infringement of copyright or business interests by acts of unfair competition in a comprehensive manner (Shinohara, 2005, p.134).

2.1.4 Legal Status for Universities

As a part of the strategy, in 2004, the most significant change was for the National Universities, which formally acquired their autonomy from the government administration, becoming independent entities.

As Yamamoto (2004, p. 5) appoints, in the former system, national universities were internal organizations within the government. At the same time, academic staff in national universities had academic freedom in teaching and research, although the finance and the execution were under bureaucratic control, in other words, straightforward vertical relationship in compliance with the procedural or input oriented and process regulations.

National Universities became legally separated bodies from the Ministry of Education and had much freedom for managing resources. By 2006, Japan had adopted the Technical Licensing Organization (TLO) concept to 34 (mainly) university centers, in which approved TLOs were able to use national university properties without any cost. The role of TLOs has expanded further from solely tech-transfer functionality to becoming centers that assist university start-ups and obtain patents (Taplin, 2007, p.1).

Takahashi, M. & Carraz, R. (2009, p.5) analyzed the changes of status on invention disclosures and patent applications after the Universities had legal status, he found that the invention disclosures have started to rise before the Incorporation, with a strong hike from 2002 and 2003, it preceded the increase of patenting.

They also concluded that by 2007, the number of national patent applications decreased for the first time, while the number of foreign applications intensified. Furthermore, universities seem to have gained expertise and quality as the number of national

applications decreased and foreign ones increased in 2007. Foreign applications are often judged of more value to the applicant as they cost more to start and maintain.

With the new status of national Universities, it was necessary to clarify the terms of the tenure of industrial property rights, as well as the right to use and commercialize them. The Japanese Patent Law, in its Section 35, paragraph 1 mention that an employer who has obtained a patent for an invention which, by the nature of the said invention, falls within the scope of the business of the said employer, etc. and was achieved by an act(s) categorized as a present or past duty of the said employee etc. performed for the employer, etc., shall have a non-exclusive license on the said patent right.

The previous law also considered that the employee in accordance with any agreement shall have the right to receive reasonable value. As Nakayama (2002) appoints, Japanese Patent Law does not say much about how reasonable remuneration should be determined for the employees. All it provided is that two factors should be considered; the profit that employers will make and the contribution by employees. Consequently, what employers think “reasonable remuneration” does not always conform to what employees think “reasonable remuneration”.

The reasonable remuneration could be economic but also could be another benefit; regarding this issue, MEXT published a Guidelines in April 2016, clarifying that "other economic benefit" includes stock options, foreign study opportunities, and extra vacation days, but excludes honorary titles and appreciation certificates. An amendment of this Guidelines was made in 2015, for the first time, an employer to cause the right to receive a patent to vest directly in the employer rather than the employee. To do so, the employer must have an internal policy announced to its employees that calls for such vesting (Kosinski, Albagli, and Asayama, 2016).

2.1.5 Additional supporting measures for Universities in Japan

Additional supporting measures for Universities in Japan, mainly managed by JPO, JST, METI and MEXT, this measures included in general Information and consultation services, develop of human resources and support for industry/academia collaboration.

The following years after the Universities acquired legal status more actions were implemented to foster intellectual property rights at the Universities, in the Intellectual Property Strategic Program 2008 for example, it was a right guess for strengthening the Intellectual Property Strategies at Universities and Research Institute to promote the Spread of an Intellectual Property Mindset Among Both Upstream and Downstream Researchers. The previous comprised the following actions:

1) Raising the intellectual property mindset among researchers
2) Inspecting the intellectual property policy measures from the viewpoint of researchers.
3) Enhancing the producing capability for the intellectual property strategy.

The previous actions supported from the Government of Japan (GOJ) included training, lectures and other activities targeting researchers, etc., which are aimed at raising awareness and enlightening the importance of filing a patent application in advance of presenting a research paper for the strategic obtainment of intellectual property rights. It also considered an Academy representing Japanese scientists to make specific suggestions to the intellectual property measures.

By 2016, the spread and penetration of Intellectual Property Awareness remained as one of the four pillars on which it was built the "Intellectual Property Strategic Program 2016". This pillar is related to the augmentation of Intellectual Property Education and Intellectual Property Human Resources Development “with the aim of empowering everyone in Japan as an IP human resource, promote systematic, developmental stage-appropriate IP education at the primary, secondary and university levels; develop an educational support system in partnership with society and local communities; build a foundation for promoting IP education...etc.”. In order to enhance the Intellectual Property Cycle, the Government of Japan has worked to strengthen industry-academia-government collaboration by setting up an intellectual property headquarters in each university (IP Policy Vision, 2013).

Besides, the Japan Patent Office provides the Universities with the following support:

- Information and consultation services, JPO also dispatched IP experts to the Universities to support the protection and commercialization of the inventions.

- Fee reduction to the university patent application which consists in the discount of half of the fee for requesting an examination and half of the annual patent fee for the first ten years.
- Accelerated examination and accelerated appeal examination systems for academic institutes-related applications.
- A search service “J-PlatPad” which is run by the National Center for Industrial Property Information and Training (INPIT) provides databases of publications of a patent, utility model, industrial design and trademark.

On the other hand, the Japan Science and Technology Agency (JST) functions as a governmental intermediary patent agent for open innovation by promoting the acquisition of patents for innovative technologies by universities, and the utilization of those university-owned patents through the collaboration with companies (Swedish Agency for Growth Policy Analysis, 2015, p.7).

JST has the Technology Transfer and Innovation Program through which identifies research projects that show significant potential as the basis for future innovation. To ensure that the projects have a positive impact on the economy, society, and living standards in Japan, JST operates a broad array of programs to support collaboration between the university and public-sector researchers and the private sector.

The Ministry of Economy, Trade, and Industry (METI), launched in 2018 the “J-Startup” program, this initiative aims to incubate internationally competitive and winning startups and encourage them to provide new value to the rest of the world through their innovative technologies and business models.

Chapter 3 : Methodology of the study

This study is conducted by the following methodology; first, there is a review of previous academic studies related with the main topic and relevant data of IP in the Universities in Japan, and it is presented relevant data of IP in the Universities in Japan and Mexico. Then, interviews are conducted with key agents of the intellectual property offices of different Universities, one interview with people of a research center and a person from the Japan Patent Office. Finally, a qualitative and quantitative analysis is performed to make some conclusions and recommendations.

The qualitative analysis regards the previous academic studies and the outcome of the interviews. The review of previous academic studies, consider the literature related to the strategies for fostering and promoting the Industrial Property rights in Japan, especially those related to accomplishing this purpose in the Universities. It is important to point out that for the review of the previous literature and studies, it was just considered the literature available in English. A quantitative analysis is made from the interviews outcome and the IP data.

Information of the interviews

In total, nine interviews were conducted, seven interviews are from people with broad experience in managing industrial property rights at the university, one interview is with two experienced persons working in a National Research Center and one interview is from experienced people working in the Japan Patent Office. The questionnaire designed for the interviewees with the experience working in the IP University Office was mainly focused on three sections:

- ✓ Programs and activities of the Japanese government and universities to motivate, encourage and support their researchers to protect their inventions. This section was designed to know which programs and strategies implemented by the government and the Universities themselves providing support to foster industrial property rights. The questions in this section seek to find the incentives provided to the researchers and the professors to protect their inventions as well as knowing the opinion of the interviewee regarding the current state of consciousness of industrial property rights among researchers in Universities.

✓ The most important factors which the professors and researchers should know for protecting and commercializing the research output. The second section in the questionnaire was designed to know about the process of protection of inventions at the university, how the decision is made to whether or not file an application, and how does the university attract funds to develop the technology for being utilized or commercialized in the market.

✓ Best practices of the IP people experience in which IP rights provide more value for the research. The last section of the questionnaire inquires about the experience of the interviewee and best practices working in the field of IP.

A specific questionnaire was adapted for the interview to the people from the Research Center and the JPO. For further information, the questionnaires and the transcription of each interview are available for consultation in the appendixes.

Below is shown the list of the experienced people interviewed from Universities, National Research Center and JPO, who very kindly collaborated with this study.

Table 1. List of people interviewed from Universities, TLO, National Research Center and JPO.

Interviewees	Institution
Professor Kenichi Hatori Executive Director	University Network for Innovation and Technology Transfer (UNITT)
Professor Kiriko Abe Assistant Professor, MEng, MBA. Leader of Intellectual property and Research Compliance. Innovative research & Liaison Organization	Shinshu University
Professor Katsuhiko Shionoya Specially Appointed Professor	Tohoku University
Professor Kimiyoshi Watanabe Patent Attorney. Junior Associate Professor. Institute of Research Division for Research Innovation. Research Center for Industry Alliances	Tokyo Medical and Dental University (TMDU)
Mr. Ryo Washizaki **Mr. Satoshi Kurokawa** Intellectual Property and Standardization Planning Office	National Institute of Advanced Industrial Science and Technology (AIST)
Mr. Takafumi Yamamoto CEO & President	TODAI TLO, Ltd. Technology Transfer Organization. The University of Tokyo
Ms. Yukiko Cooper Assistant Manager	Okinawa Institute of Science and Technology Graduate University (OIST)
Professor Kosuke Kato Ph.D., RTTP	Osaka University
Policy Planning and Research Division, Administrative Affairs Division, International Cooperation Division, Trial and Appeal Division	Japan Patent Office (JPO)

Chapter 4 : Results and Analysis

In this chapter, the information obtained in the interviews is analyzed and the results of this work are presented, but first, as a context, it includes some relevant data concerning Higher Education Institutions and Universities in Japan and Mexico.

4.1 Mexican and Japanese general context

According to data from The World Bank (2017), the population in Japan was 126,785,797 while in Mexico there were 129,163,276 million people; the population of both countries are similar, so it is the number of Institutions of Higher Education. In Japan, there are 4,414 institutions while in Mexico there are 5,455 institutions, we can see the distribution in figures 2 and 3.

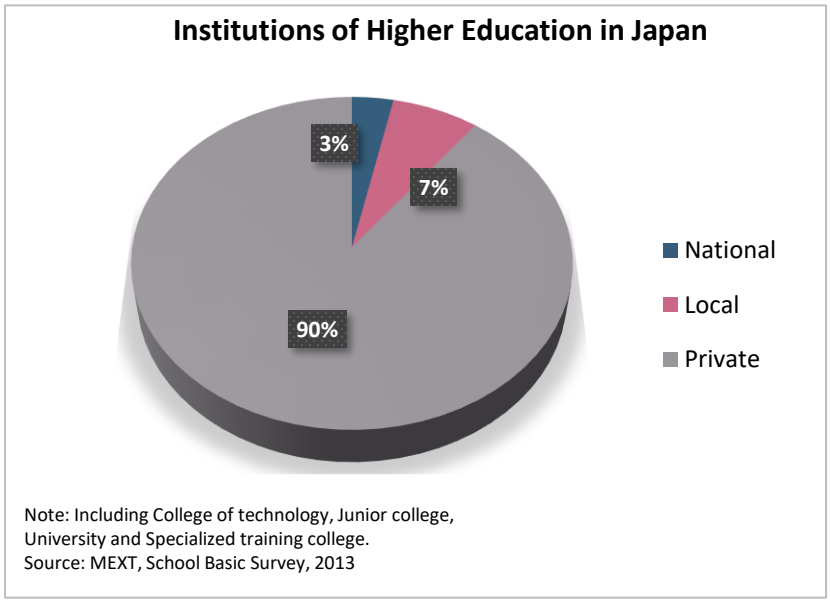


Figure 2. Institutions of Higher Education in Japan.

In Japan, according to MEXT, there are 782 Universities, of which 86 are National Universities, 90 are Local Universities and 606 are Private Universities; in figure 2 we can appreciate that 90% of higher institutions are private.

On the other hand, according to data from the Ministry of Public Education, in Mexico, there are 9 Federal Public Universities, 34 State Public Universities, 23 State Public Universities with Solidarity Support, 156 Technological Institutes (federal and decentralized), 104 Technological Universities, 51 Polytechnic Universities and 13

Intercultural Universities, which constitute the system of higher education in the country. In figure 3, we can observe that a little less than 60% are private Universities, 40% are other kind of public institutions and 1.21% are federal and state public Universities.

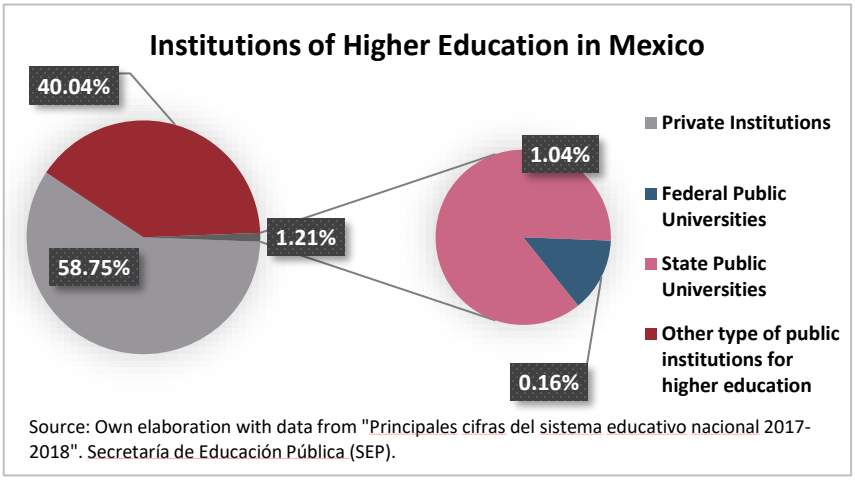


Figure 3. Institutions of Higher Education in Mexico.

Concerning the number of university's patent applications data of Japan and Mexico in 2017, please observe figures 4 and 5.

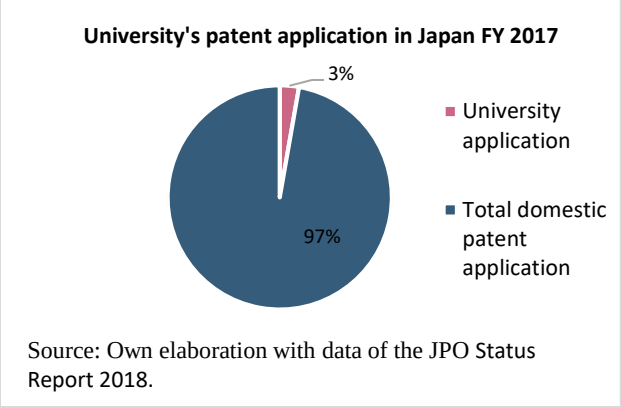


Figure 4. University's patent application in Japan FY 2017.

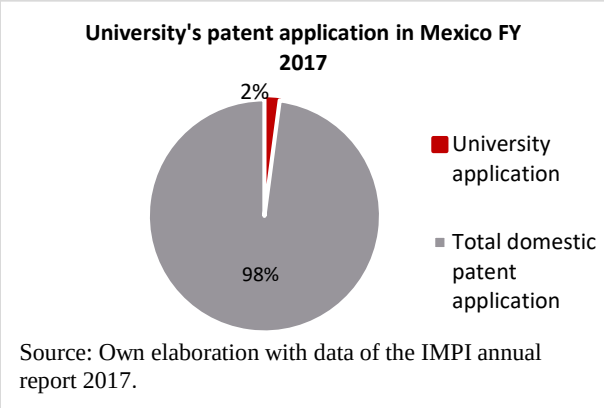


Figure 5. University's patent application in Mexico FY 2017.

While in Japan, data from the JPO Status Report 2018 shows that the Universities filed 7,281 patent domestic application (which represents 2.84% of the total), the Mexican Institute of Industrial Property (IMPI) annual report 2017 shows that Mexican Universities just filed 368 patent domestic application (which represents 2.14% of the total).

The University of Tokyo (UTokyo) which is the first one in the ranking of filing patent applications in Japan, filed 620. The university in Mexico which is number one in the

ranking is the National Autonomous University (UNAM) which filed just 53 patent applications.

Notably, in 2017, the UTokyo had 284 patent registered while UNAM registered 43. If we compare the size of both Universities; the University of Tokyo has 28,253 students and 10,671 academic and administrative staff while UNAM has 349,515 students and 40,578 academic staff, however, the UTokyo file 10 times more patent application than UNAM.

In the following table, is possible to observe the ten Japanese Universities with more patent registrations in 2017.

Table 2. Top 10 Universities with the Most Number of Patent Registrations.

Top 10 Universities with the Most Number of Patent Registrations in 2017		
Rank in 2017	**University**	**Number of Registrations**
1	The University of Tokyo	284
2	Tohoku University	227
3	Osaka University	150
4	Kyoto University	139
5	Tokyo Institute of Technology	128
6	Kyushu University	122
7	Nagoya University	96
8	Chiba University	78
9	Hokkaido University	68
9	Hiroshima University	68

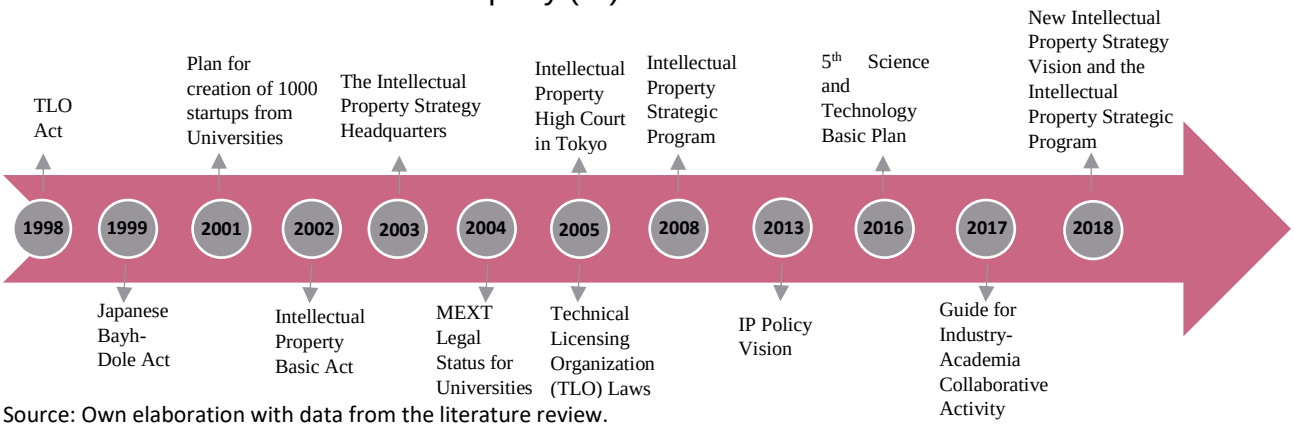
Notes:
-Applications by filed a university president, university, or approved TLO were counted.
- The count includes joint applications with corporations, etc.
- In the case joint applicants filed, each applicant was counted
Source: JPO Status Report (2018). Japan Patent Office.

4.2 Effects of the Japanese strategy for fostering IP rights in Universities

In Japan, in 1999 the TLO act was one of the first efforts aimed at promoting the transfer of research outputs to the industry, in this act were contemplated the Universities, including the National Colleges of Technology and the Inter-University Research Institutes.

In 2002, the Intellectual Property Basic Act specifically established the new mission for Universities in its Article 7, “in light of the fact that their activities are contributing to the creation of intellectual property in the whole society, endeavor voluntary and positive to develop human resources, disseminate research and the research results”. By 2004, National Universities obtained legal independence, which allowed them to be the owners of patent rights.

In the following years, it was consequently reviewed the intellectual property strategic program, analyzing and adapting the actions and strategies to the current needs. Figure 6 shows a timeline of the main actions carried out by the Japanese government in his desire to foster the Intellectual Property (IP).



Source: Own elaboration with data from the literature review.

Figure 6. Timeline of Laws and Japanese Government Strategies to Foster Industrial Property Rights.

As a result of the implementation of different programs, more Offices of Technology Licensing (OTL) were set up in the Japanese Universities.

To face the changes and the fulfillment of the third mission of university, the Japanese universities developed their own strategies, differentiating themselves one from each other. As first actions, IP policies were elaborated and modified in the Universities, likewise, the different ways in which knowledge was transferred to society were established.

Differences in Universities for transferring knowledge remains, according to Hatori (2016), there are three main different types of models for a patent prosecution and technology transfer at Japanese universities. The first is an integrated form of an Intellectual Property Office (IPO) and a Technology Transfer Office TTO; the second is a form of one-to-one

cooperation between a university and an extra-campus TTO. The third is a form of one-to-many cooperation between an extra-campus TTO and multiple universities (wide-area TTO). The next figure represents the previous points.

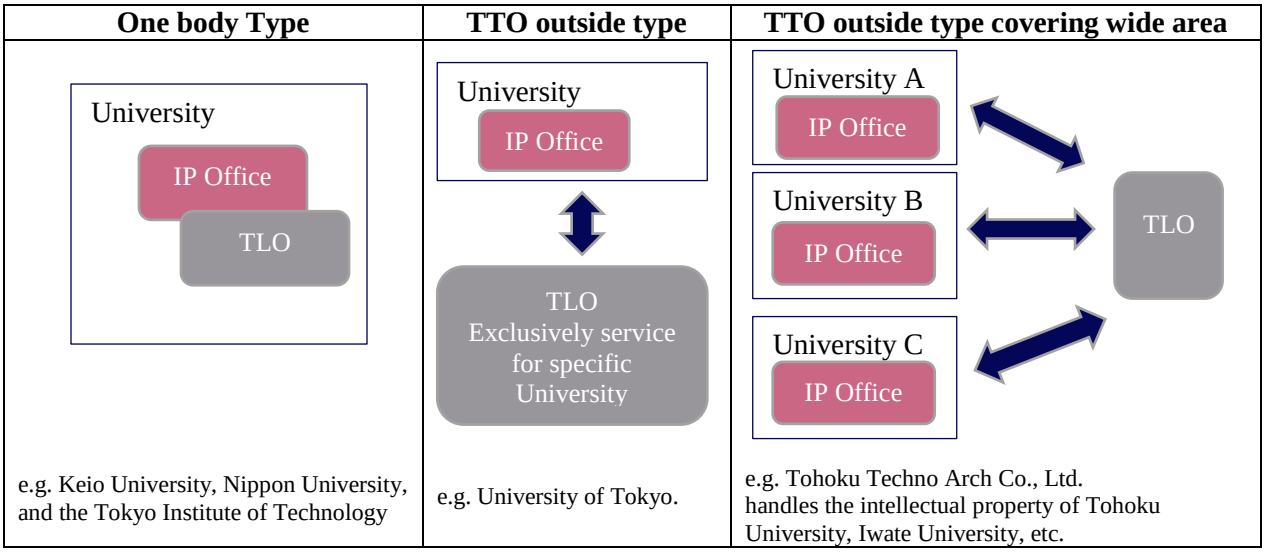


Figure 7. Various models for a patent prosecution and technology transfer from university.
Adapted from "Intellectual Property Management at Japanese Universities" by K. Hatori, 2016.Japan Patent Office. Asia-Pacific Industrial Property Center, Japan Institute for promoting Invention and Innovation, p.11. Copyright [2016] by the Japan Patent Office.

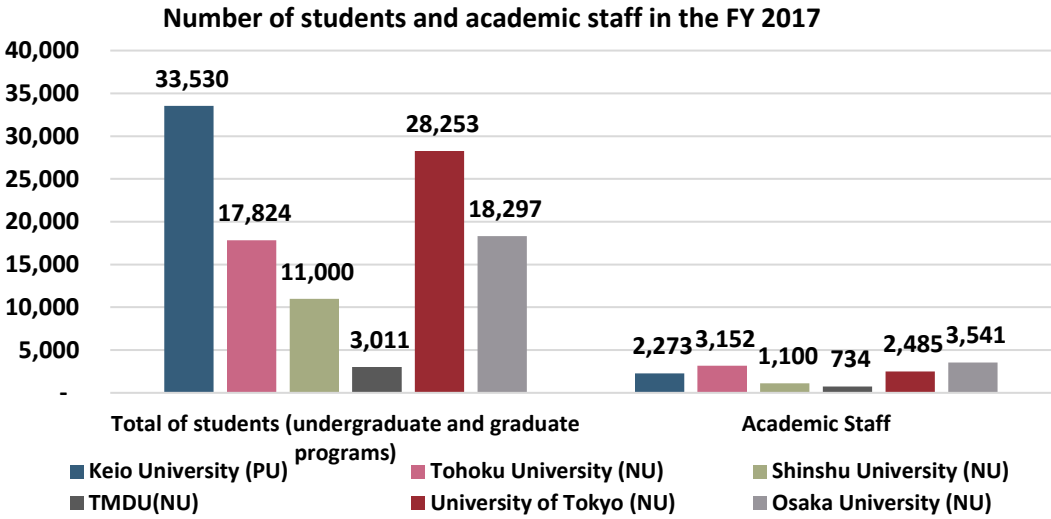
4.3 Results from the Interviews

In total, seven interviews were conducted to IP specialists in the Japanese universities: Keio University, Shinshu University, Tohoku University, Tokyo Medical and Dental University (TMDU), The University of Tokyo (UTokyo), Osaka University and the Okinawa Institute of Science and Technology Graduate University (OIST); one interview was made to IP specialists from the National Institute of Advanced Industrial Science and Technology (AIST) and 1 with people from the JPO.

The interviews aim to point out the awareness of IP among the researchers, the process of protecting inventions, and hopefully will help identifying good practices in the Universities.

4.3.1 Interviews to people with IP experience in Japanese Universities, a Research Center and the JPO

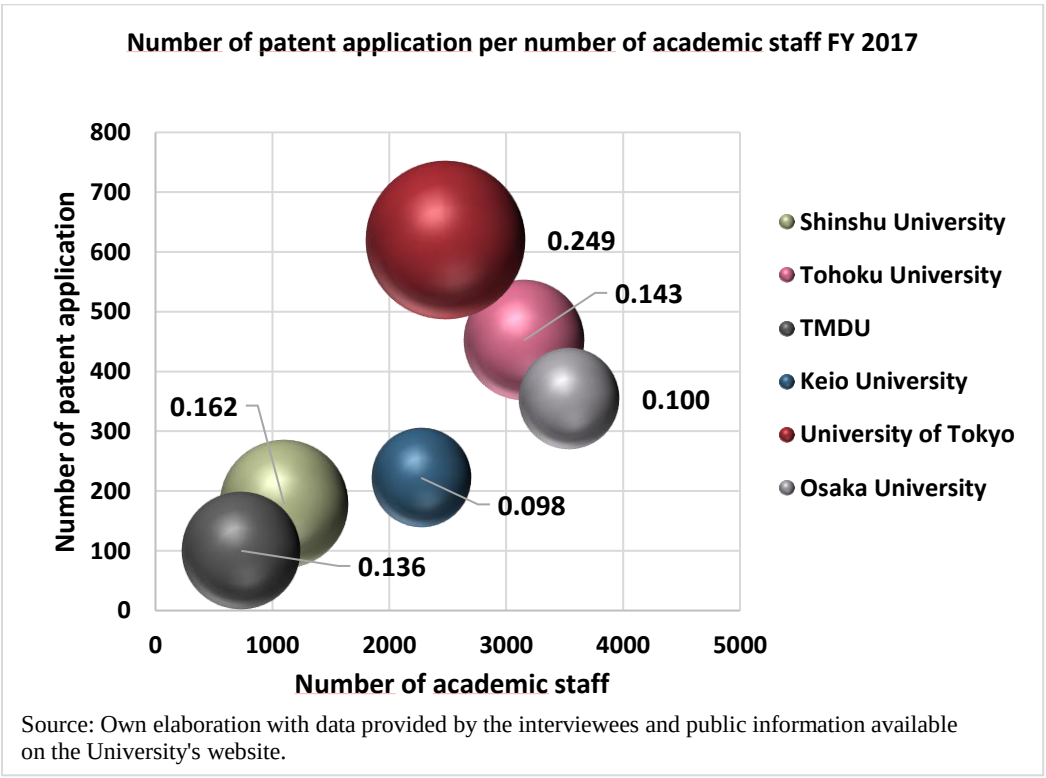
First of all, it is important to take into consideration the size of the Universities while analyzing the results of the interviews; the following charts point out this data information.



Source: Own elaboration with data provided by the interviewees and public information available on the University's website. Notes: NU- National University; PU- Private University

Figure 8. Number of students and academic staff

Figure 9 shows the relationship of the number of patent application per number of academic staff un the Fiscal Year 2017. The size of the bubble represents the average of patent application per number of academic staff.



Source: Own elaboration with data provided by the interviewees and public information available on the University's website.

Figure 9. Number of patent application per number of academic staff

In the previous charts, OIST is not included because it is a special case, it has only 174 students in graduate programs and 59 faculty members, 440 Research Units Staff and 65 patent filings, however, OIST had in 2017 four licenses of which two were made to startups.

The National Institute of Advanced Industrial Science and Technology (AIST) as a research center is not included but it has 600 domestic patent applications per year and it has 2,333 researchers, the size of the bubble is 0.34, which means that on average, there is 0.34 patent application per each researcher in AIST.

Considering the characteristics of the Universities, 71.42% of them have multidisciplinary programs of study and research scope, except TMDU and OIST, in the case of TMDU the focus is on medical and dental area, while in OIST the focus is mainly on Environmental and Ecological Sciences. It is important to notice, for example that in the case of KEIO University about 60% of the researchers are in Social and Humanities Sciences. It is possible to observe more details in table 3.

Table 3. Characteristics of Universities.

Characteristics of Universities (Number of Faculties and Programs of Study)	
Shinshu University	• 8 Undergraduate Faculties and 6 Graduate Schools in multidisciplinary programs of study. • Arts, Education, Economics and Law, Science, Medicine, Engineering, Agriculture, and Textile Science and Technology)
Tohoku University	• 10 Undergraduate Faculties and 19 Graduate Schools, 12 research centers and the University Hospital. • Arts , Education, Law, Economics, Science, Medicine, Dentistry, Pharmaceutical Sciences, Engineering, Agriculture
TMDU	• Yushima Campus, Surugadai Campus, and Kounodai Campus • Medicine, Health Care Sciences and Dentistry Programs
Keio University	• 10 Undergraduate Faculties and 14 Graduate Schools in multidisciplinary programs of study • About 60% of the researchers are in Social and Humanities Sciences
University of Tokyo	• 10 Undergraduate Faculties and 15 Graduate Schools in multidisciplinary programs of study • Agriculture, Art, Economics, Education, Engineering, Law, Letters, Medicine, Pharmaceutical sciences, Humanities and Sociology, Public policy, Sciences.
Osaka University	• 11 Schools with 10 Corresponding Graduate Schools and 6 Independent Graduate Schools in multidisciplinary programs of study • Human Sciences, Law and Politics, Economics, Science, Medicine, Dentistry, Pharmaceutical Sciences, Engineering, Bioscience
OIST	• Okinawa Campus, Graduate Faculty • Chemistry; Environmental and Ecological Sciences; Marine Sciences; Mathematical and Computational Sciences; Molecular, Cell, and Developmental Biology, Neuroscience, Physics

Source: Own elaboration with data available on the university's website.

In the case of AIST, it does not have Faculties and Programs of study, but the research themes are on the areas of Energy and Environment, Life Sciences and Biotechnology, Information Technology and Human Factors, Materials and Chemistry and Electronics and Manufacturing, but mainly focuses on Life Sciences, Biotechnology and Engineering.

AIST has 2,333 researchers, in 2017, it generated ¥429 million IP revenues in 2017, created 5 startups, filed 800 patent applications per year (including domestic and international applications) ant it has around 1,000 licenses per year.

4.3.1.1 Programs for support the researchers for protecting and commercializing their inventions and increase the awareness of IP

A common denominator among the responses of the interviews is the organization of seminars for communicating the professors and the researchers the intellectual property policies, but also for letting them know how the university support the protection of inventions and technological transfer. In some universities it occurs more frequently than in others; at the University of Tokyo, for example, this information is provided explicitly to each professor since he or she becomes part of the university.

The Japan Patent Office (JPO) implement different programs or activities to disseminate the awareness of industrial property rights among researchers in the Universities and the Research Centers. Based on requests from universities and research institutions, the JPO sends its staff to give lectures designed for their researchers about intellectual property (IP) issues. As a recent example, JPO staff delivered a speech mainly for researchers at the University of Aizu in Fukushima on October 20, 2018.

The JPO also provides a training course on Academia-Industry Collaboration and Technology Transfer. The target participants are mainly people from Universities and Research Centers involved in intellectual property management or utilization.

Regarding supporting measurements, the JPO provide advisors to foster industry-university collaboration and fee discounts, for example, next year they will reduce 50% of the cost of PCT applications.

The JPO sends its IP experts called “intellectual property advisors for university-industry collaboration” to small and medium-sized universities and colleges that have been advancing industry-academia collaborations for promoting commercialization of their research results. This has been done to support them, focusing on the ways for managing intellectual property in their projects based on industry-academia collaboration for promoting commercialization of their R&D activities with partner companies.

Related with the previous, the JPO provide advice on how to clarify inventions that are needed for promoting commercialization of R&D activities; how to acquire patent rights for these inventions; and the ways for utilizing the patented inventions in a portfolio of intellectual property rights.

The JPO also offers support to the Universities and Research Centers according to the ongoing progress of each project, including support for conducting clearance searches for patents or checking whether their business activities or products are likely to infringe intellectual property rights of others.

Especially, for universities or research institutes that have been advancing R&D projects, to which public funds were invested with the hope of innovative results, the JPO sends its experts on IP management called “intellectual property producers” to support the R&D projects. The support activities include formulating strategies to utilize the achievements of the projects from the perspective of the effective use of intellectual property rights; and IP management for the projects.

On the other hand, JST organizes Open Innovation Seminars, where companies communicate their research-related needs to the universities, including issues that require short-term solutions and issues on which there could be collaborative research.

Besides, in Japan take place important events year after year. It is the case of the Conference organized by the University Network for Innovation and Technology Transfer (UNITT) which first event took place in 2004. The Conference is recognized internationally and represents an opportunity to do networking but also to learn about the most current issues and challenges of technology transfer from universities.

Another support that some Japanese universities offer to the researchers who mostly have other different activities (e.g., teaching, administrating activities), is helping them by hiring University Research Administrator (URAs), URAs support researchers in various research activities so they can focus on research.

The first efforts of support for having URAs in the Japanese Universities started in 2009 when the Japanese government launched the URA project, this occurred after a significant cut in science and technology budgets, especially for the basic science, which the government strongly insisted on a demonstration of the necessity for such research.

Sugihara, Sonobe & Mutoh (2014), describe the University of Kyoto as a reference adapting the URA system, through which recruited eight people managed by a new central administration office of Kyoto University Research Administration, called KURA. In this dynamic of work, the URAs facilitated the communication between researchers and the administrators, so that they could work closer and the KURA could correctly understand the demands on the researchers' side.

Lately, MEXT has been supporting the Universities for developing URA System under the "Program for Establishment of the Research Administration System" (2012-2016) and the "Program for Promoting the Enhancement of Research Universities" (2013-2022); as a result, some Universities have adopted the URA System.

4.3.1.2 General processes for protecting and commercializing the research output

As the result of the interviews, it was possible to identify how Universities support its researchers and which is the General Workflow from invention disclosure to technology transfer activities in the Universities. First of all, there is a notification of the invention, for example, this can be made online in the case of Tohoku University, then there is an analysis and an evaluation of the invention in order to take the decision whether to file or not an application; if the decision is positive, after filing the application, starts the activities for transferring the technology. In the next figure it can be observed the workflow.

Source: Own elaboration with data provided by the interviewees
Figure 10. General Workflow, from invention disclosure to technology transfer activities.

The results from the interviews also shows that the Research Center and all the Universities except UTokyo have a Committee for evaluate and decide whether or not to file a patent. In the table 4 is possible to appreciate details of the evaluation and the criteria for the decision making of filing a patent.

Table 4. Evaluation criteria and decision making whether or not to file a patent.

Evaluation criteria and decision making whether or not to file a patent				
Institution	**Number of evaluators**	**Members of the Committee**	**Evaluation criteria**	**Periodicity**
Shinshu University	10	University professors and IP officers (panel for engineering and life sciences)	Value of the application and relevance of the research for the university	Once a month
Tohoku University	10	Tohoku Techno Arch	Patentability, company and Industry Activity and Strategy	Every Monday
		Members from each faculty professor		Once a month
TMDU	8	Include 1 external Medical Doctor member	Patentability, feasibility and the probability of licensing	Once a month
Keio University	6	Technology transfer experts of different fields(Committee for engineering and bio sciences)	Patentability, Business/commercialization opportunity	Once a month
OIST	10	IP attorney (external), the Vice-president of TLO and IP office members	Patentability, commerciality, continuity of researchers in the institution	Every week
Osaka University	10	Internal IP Officers	Patentability and Market potential	Regularly
AIST	15	IP office and technology transfer office	Market potential	Regularly
UTokyo	NA	N/A	Patentability and Marketability	N/A
Source: Own elaboration with data provided by the interviewees.				

In average, the Committee of the Universities are integrated by 6 to 15 members, mainly internal members. In the case of TMDU and OIST there is an external member, in the first case is a Medical Doctor, and in the second case is a patent attorney; including an external member could ensure the impartiality of the Committee's decision.

The evaluation criteria have in common the evaluation of patentability and the possibility of commercialization of the invention in the market. In the case of AIST, they just prioritize

the market potential, this is because the Research Center mission is very different from the one in the university; while university aims to contribute with the society, AIST aim to support prosperity of economy and industry. Another interesting information is that in UTokyo, for example TODAI TLO is the one who evaluate and recommends to the University of Tokyo whether or not to file a patent, in this case, Mr. Yamamoto said that they don't have a Committee and he does not even recommend to have one because usually the members of the Committee don't know about the marketability of inventions.

Regularly, if a university does not file an application give the right back to the researchers, however, in that case, the researchers do not receive neither financial resources nor institutional support.

In what refers to the incentive scheme for inventors depends of each Japanese university, as is possible to see in table 5, the inventors receive from 30 to 50% of the royalty amount; in the majority of the Universities, they deduct the cost associated with the patent application and after they split the corresponding percentage. In the case of AIST, the percentage that the inventors will receive depend of the amount of the royalties received.

Table 5. Incentive schemes for protecting inventions in Japanese Universities.

Japanese Universities		
University	**% of income of royalty fees**	**Economic Award**
Shinshu University	40%	¥5,000
Tohoku University	30%	
TMDU	40%	¥30,000
Keio University	50%*	
UTokyo	40%*	
Osaka University	33.33%*	
OIST	33.33%*	
AIST	15-50%**	

*After deducting cost of filing, e.g. Keio U. is 15%; ** Depends on the amount.
Source: Own elaboration with data provided by the interviewees.

Shinshu University and TMDU offers an economic award to the group of inventors, the money can be used for future theme of research. Additionally, Shinshu University requires a performance report that each researcher has to submit, in this, it is scored the number of patent applications and patent registrations; this score affects their promotion and the compensation increase.

In the case of Keio University, it commends a researcher whose invention or creation owned by Keio is utilized in society in the most remarkable way.

Publishing vs filing an IP application

Publishing an article in a journal is not opposed to filing an invention application in a patent office, however, it is well known that sometimes such publication affects the novelty of the invention. In the questionnaire, one of the questions was related with the opinion of the interviewee about the recommendation of protecting the inventions before publishing it. Most of the interviewees said that they highly recommend the researchers to file the application before publishing but at the end, they respect the researcher's decision on what time the invention should be published. However, in AIST there is a policy which establishes that they will not file a patent application if there was a previous disclosure. On the other hand, Mr. Yamamoto, from TODAI TLO, appointed that now it is not a big issue, as long as they have the possibility of filing a provisional patent application in the US with a low cost and in the easiest way.

Accelerated Examination and Accelerated Appeal Examination

One of the options for Universities and Research Centers applicants is to request Accelerated Examination and Accelerated Appeal Examination. According to the JPO, when universities and public research institutions file patent applications, their applications can undergo accelerated examinations without additional fee. When accelerated examinations are conducted, applicants can receive the first office action earlier, compared to regular examination. On the other hand, in appeal against an examiner's decision of refusal cases for patents, where all or some of the demandants are universities, junior colleges, or public research institutions, appeals are subject to accelerated appeal proceedings. When demandants file a request for accelerated appeal proceedings, they can obtain the results of the proceedings earlier, compared to regular appeal proceedings.

4.3.1.3 University's industrial property rights and the value of the research output

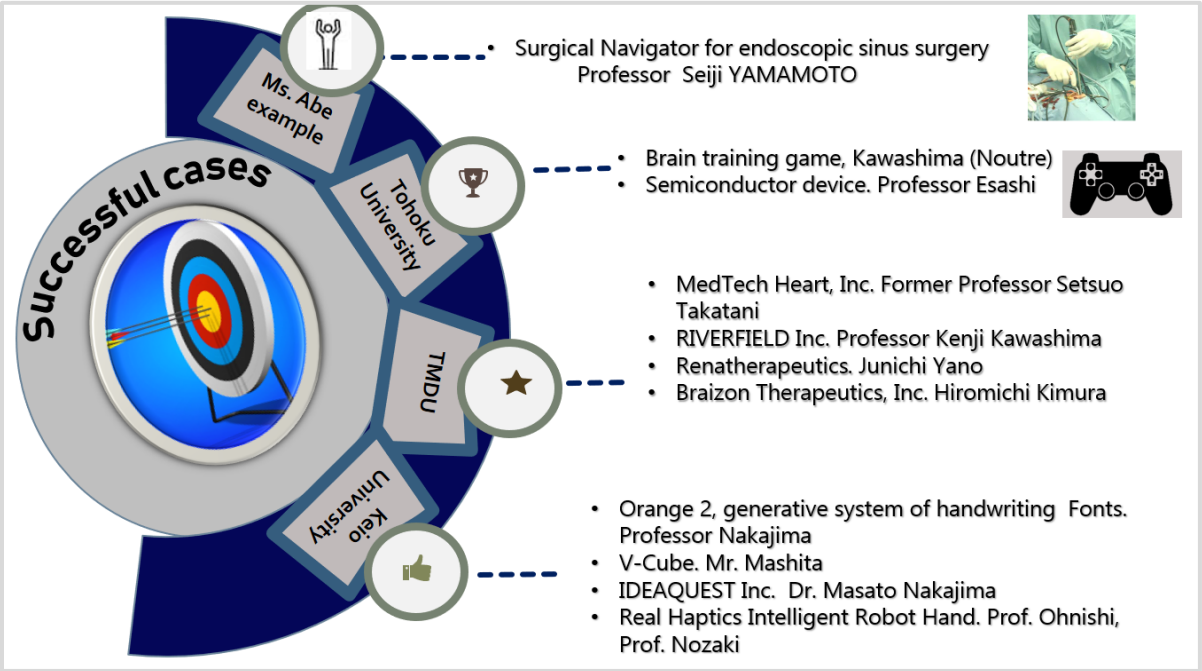
Generating patents has achieved important relevance for the benefit of society but also since their commercialization represent benefits for the Universities and the researchers,

however, as most of the technology is basic research, there are some difficulties in the process of protecting and commercializing it.

In this section the information of successful cases in Japanese Universities are presented, as well as some factors that could encourage the researchers to protect their inventions, this from the point of view and the experience of the interviewees.

Successful cases in Japanese Universities

There is a question of the questionnaire related with the successful cases for protecting and commercializing inventions, the responses of the interviewees are very interesting because they answered from different perspectives. Figures 11 and 12 show the cases mentioned in the interviews.



Source: Own elaboration with data provided by the interviewees.
Figure 11. Successful cases in Japanese Universities (part 1).

The first case does not directly relate to Shinshu University. Prof. Yamamoto is a Professor and the current Vice President of Hamamatsu University School of Medicine. His project was performed by the collaboration between Hamamatsu University of Medicine and Shizuoka University. Ms. Abe referred it from her former experiences. This case is interesting, is considered a successful case despite not having been so successful

in the market, but because they successfully combine a particular invention at a medical school with the invention of their own researchers, so they had the ability to reach agreements with different institutions.

Tohoku University has a brain training game named Kawashima (Noutre), it is well known in Europe and in the United States. Professor Kawashima made games from Nintendo family computer, portable games. Ten years ago Tohoku University got very big money (10 billion) from Nintendo. Tohoku University has many successful cases of collaboration with companies, mainly because the professors and researchers fit industrial requirements company.

In TMDU the successful cases are startups which were born as a result of TDMU effort, there is a certification scheme, when they have the certification, TMDU gives them a title of TMDU initiative startup, and they can freely use it. For example, MedTech Heart, Inc. funded by former Professor Setsuo Takatani develops hearts.

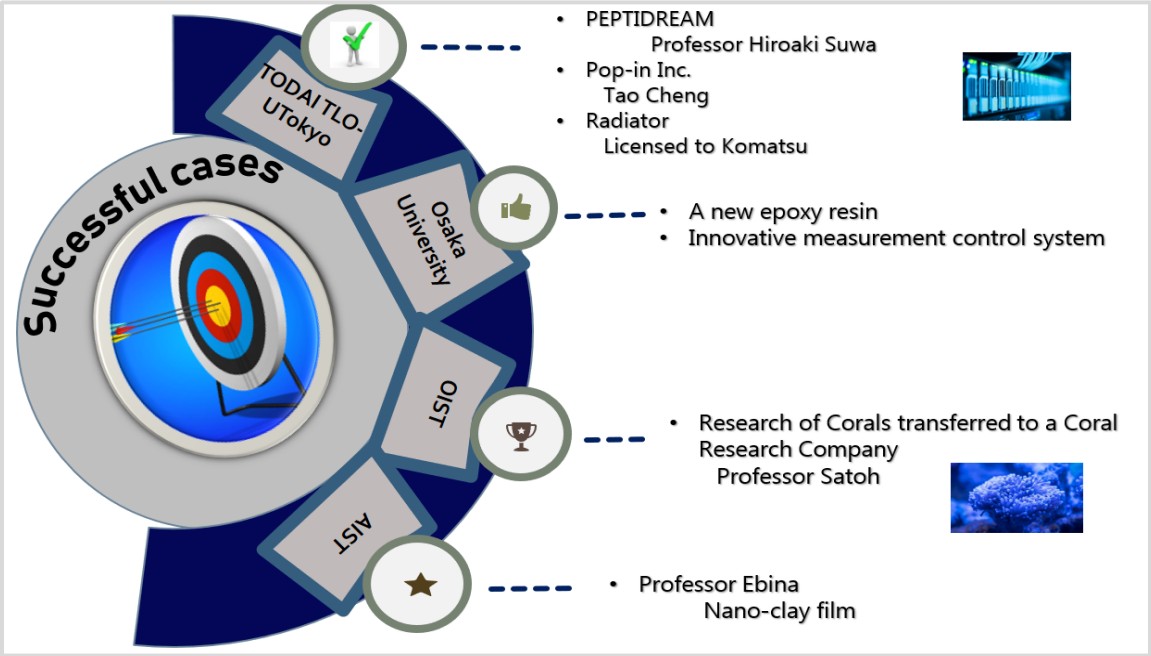
One of the most interesting successful cases is the one of Keio University about the intelligent robot hand which can grab a Tofu sweet[1] without destroy it. In this case, the professor didn't want to publish everything in the patent application, so the invention had a very complicated password that not everyone could understand or discover how he did. By using a chip, the professor allowed the companies to utilize it, it was the best strategy to give the chip to the companies so they could develop prototypes and then when the prototypes worked with the chip, the university and the professor would receive a licensing fee.

Besides, another successful of Keio University is the start-up called "IDEAQUEST Inc.". Dr. Masato Nakajima invented a non-contact monitoring system for people with dementia. The Professor made so much inventions before this technology, and after 65 designs he decided to start-up with his student. The Professor was over 65 years old, he was retired from Keio University, and his student around 40 years. By the time this invention was licensed, but the company did not commercialize the technology, so the professor bought

[1] Tofu sweet is a typical Japanese sweet whose texture is exceptionally soft.

the industrial property rights from the company for utilize it in his startup. The system was introduced in care houses; the government support the budget to have this system; the Japanese government paid ¾ of the care houses for having the system. In this case, the key point was to start-up.

One of the most successful cases of startup in Japan is Peptidream, a spin-off from the University of Tokyo. This company succeeded into IP because Novartis, GSK which are such a big pharmaceutical companies has already prompted with Peptidream, in 2017 the prize of this company's stock significantly increased.



Source: Own elaboration with data provided by the interviewees.
Figure 12. Successful cases in Japanese Universities (part 2).

Another successful case of UTokyo is Pop-in, it was stablished by Mr. Tou Tei a student exchange from China; Pop-in succeed and it was acquired by a company named Baidu which is a Chinese multinational technology company specializing in internet services.

An interesting case of licensing in UTokyo, is the one related with the invention of a radiator. Komatsu (which make constructing machines) or another Japanese companies, didn't believe the performance of the new type of radiator, and Komatsu the first two years wanted to make a new type of radiator by themselves, so when Utokyo wanted to license this technology to another company, Komatsu's people ask to stop to introduce the

technology to another companies, because the companies were foreign companies. In that time new regulations from the government appeared, one related with the regulation of air in the atmosphere that came from the machines and the other related with regulations of noise pollution; the technology complied with the requirements of both regulations so it was successfully licensed.

A principal investigator at Osaka University developed a method to enable chemical powder reaction without solvent (liquid) under a laboratory scale, but it was necessary to scale up in a big reactor, so a potential licensee launched an incubation laboratory inside Osaka University under a joint research agreement, this technology has important applications in epoxies.

In OIST a research related with the see Corals was tech transferred to a Coral Research Company, there were no financial benefits, the licensing revenue was minimal, it did not even pay off the patent cost, but the sense of contribution to the local society was priceless, the researcher arrived to Okinawa few years ago and his research contributed to the local environment, that was the biggest benefit and the awareness of what OIST do among the local community. Okinawa people think that OIST is doing something huge, something very high level science, so may be that increased the value of the science.

AIST also has a very interesting successful case, Professor Ebina who is an inventor was quite good at managing IP, what he did in the first place was a press release of the discovery. But when AIST made the press release, did not mention any detail, just delivered an abstract of the technology.

Looking at the press release, many businesses approach to AIST asking what was the theme and what was the details of the technology, so AIST arranged a Non-Disclosure Agreement (NDA) in order to disclose the details, by then, Professor Ebina well captured the needs of the side of the businesses.

The success of the cases is seen from different perspectives and is not necessarily related to the obtaining of money for the commercialization of the inventions. The success cases are related to different benefits or learning obtained in the process of protection and transfer among which are the following: achieve recognition for inventors (among

their colleagues, with society), obtain funding from the laboratory or the projects of the researcher, the possibility of collaborating with the companies, the protection strategy that allows obtaining an advantage for the transfer of technology, the development of technologies to raise their level of technological maturity, the creation of startups, the licensing of the technology, but also the success is related to the use of inventions.

Factors for encouraging and increase the awareness of industrial property rights among researchers

Through the interviews and from the broad experience of the interviewees, it was possible to identify some factors that motivate professors and researchers to protect their inventions.

Professor Abe considers that one of the encouraging factor is to have any type of success, whatever small it could be, for example if a license is granted, the researchers will receive a lot of inquiries from businesses who are interested. However, not only successful cases could increase awareness of IP in the professors and researchers, but also the recognition. The recognition could occur in different manners, through the publication of the invention in the university's website or if it is cover by a local newspaper or disclosed in a local seminar or a conference with the community. When the researchers are recognized they feel that what they are doing is important and valuable, said Professor Abe.

Professor Hatori points the relevance to spread successful cases to many researchers but emphasizes that is crucial the utilization of inventions in the society. Professor Shionoya's opinion is very similar; while he considers that it is vital to share with professors the successful, he highlights how essential is to make a contribution to the society by sharing the research's output. Professor Shionoya also considers a factor of motivation that the researcher's laboratories receive money from licensing.

Mr. Yamamoto's point of view, the mind of the professors has changed and the biggest reason is that their goal it is not only research but also how to contribute to the society.

The commercialization and utilization of the inventions is very important (licenses, Startups).

From Professor Watanabe's perspective, one way for encouraging professors and researchers is to award the startups which find a good use for the technology in society, for example, with a TMDU startup is possible to show researchers how the invention is been utilized in society and is one of the ways to motivate, to be more aware of the industrial property rights.

According with the preview Mr. Washizaki from AIST ponders that the researchers feel motivated when the inventions are utilized by society and when they are awarded with research grants.

Ms. Cooper thinks that the sense of contribution to the society is priceless; the researchers want to hear from other researchers or colleagues about IP and tech transfer, and what represents, nevertheless, she considers important to provide also with money incentives (e.g., Royalty distribution).

From the standpoint of Professor Kato, is important for researchers to have access to good stories and good memories from similar faculty members, so publishing and sharing cases that previously succeeded in commercialization or IP filing in seminars or conferences is important. For Professor Kato, it is crucial to impulse projects from early majority to late majority (category of maturity life cycle), he also considers that another factor for motivating researchers is obtaining granted funds for their research.

Current state of awareness of industrial property rights among Japanese professors and researchers

From the comments of the interviewees and the results of implementation different programs to increase awareness of IP, it can be said that the professors and researchers in Japanese Universities understand what IP is and the benefits that could represent to protect and commercializing the inventions. Naturally, not all the researchers are interested in protecting the research output by IP rights, mostly depends of the area of specialization of each researcher. In the recent years, the interest of protecting inventions

have increased because there have been successful cases that are part of the incentives to participate in the IP cycle, coupled with this, the economic funds that the government grants to universities for carrying out basic research have decreased year after year, which forces researchers to look for new ways of financing their projects. Although the awareness level does not represent an issue, the interviewees consider that still being important provide seminars, lectures and activities that encourage among the researchers the protection of inventions.

The JPO is aware that some university researchers do not sufficiently understand the importance of acquiring intellectual property rights for their research results. However, the JPO believes that it is useful to raise the awareness on the importance of acquiring IP rights for valuable research results by, for example, providing information on successful cases of acquiring patent rights and unsuccessful results due to failure in acquiring patents. The JPO considers the fact that around 40% of Japanese researchers are university researchers, the JPO believes that universities have high potential of R&D activities. Based on this, if universities and Japanese companies cooperate with each other to utilize the results of R&D activities in universities, this will lead to further developing Japanese economy. To achieve this, it is essential for the JPO to work in cooperation with universities, in order to ensure that intellectual property rights will be granted to useful research results of universities.

4.3.2 Mr. Makoto Nakajima's Interview

One of the most enriching interviews was with Mr. Makoto Nakajima, Vice Chairman and Senior Executive Managing Director of the Japan Institute for Promoting Invention and Innovation (JIPII), and former Commissioner of the JPO.

Mr. Nakajima is a man with broad experience, he pointed out that 20 or 30 years ago, the professors and researchers in Japan gave more importance to article publications in scientific journals, but now they understand the importance of intellectual property rights.

As Mr. Makoto said, it was not easy to change the conscious of researchers, but it was vital to have a successful case, the one of the Professor Shinya Yamanaka who obtained relevant patents before publishing an article and later won the Nobel Prize for his relevant

work. This successful case, who was very specific and different on doing things, motivate other researchers to try. Nevertheless, it took much time to have real changes since many professors were very conservative in the way they were doing the things.

Mr. Nakajima also emphasized that the protection of inventions and articles publishing are significant, but not as important as the use of the research, which means the transfer of technology. Now, a recognized professor is not the one who has more articles published but the one who has research agreements with the industry.

Another critical point, he said that Japanese industry gives more funds to universities overseas than National Japanese Universities. The main reason is the bureaucracy that prevails in the internal procedures. As Mr. Makoto said, time is money for companies, unfortunately, is not the same principle for Nacional Universities. Regarding this, also explained that since 20 years ago, Sony establishes a different meaning of the Japanese word “Hatsumei,” before, this word meant just invention, but now the meaning of this word is understood as Invention and innovation (use of the invention in the market).

4.4 Complementary information from short training courses and a WIPO Conference

The information of this section is a summary of relevant information that was obtained from the JPO’s management of patent examination short training course in APIC (September 2018) and the “Third regional conference for Presidents and Vice Presidents of Universities and Research Institutes on creating and Enabling Intellectual Property Environment for Technology Development, Management and Commercialization”, Okinawa (November 2018).

JPO’s patent management short training course

An important goal for the JPO is the prompt examination, in the FY 2008 the average time of a domestic patent examination was 29.3 months, in 2013 was 12.5 months, and the expectation is that in 2023 the time reduces to 10 months.

The number of examinations is proportional to the number of examiners, so the management for domestic patent examination at JPO is crucial. As part of this, JPO

makes strategies to be more efficient in the examination process, one of those is the outsourcing of some prior art literature search, which reduces 50% of the time's process. In that case, the external searchers continuously communicate with the examiners to talk about the invention and having a better understanding of it. Currently, there are ten companies that the JPO hire for outsourcing searches; this represents in average 2/3 of the total applications.

Another good strategy of the JPO is that the examiners can study the latest technologies at the university, for this, examiners should have 7 to 10 years of experience working at JPO, so they get the chance to study in a foreign university. After the researchers come back from their studies, they provide lectures to other examiners.

Besides, the JPO provides a mechanism to facilitate communication between applicants and the examiners. Usually this communication occurs between the examiners and the agents (patent attorneys); the communication may occur at the request of the applicant primarily before of a notification of reasons of rejection so the examiners can understand the invention, or can occur after a reason refusal notification, so in the interview the applicant can explain the differences of the prior art. Another purpose of the interview is explaining a draft amendment to the specifications.

The interviews take place in JPO office or other districts; sometimes the examiners visit the applicant's prefecture, but also there is a TV interview examination, this one reduces costs and time.

As part of the course, there was a visit to the Trial Court and the National Center for Industrial Property Information and Training (INPIT). From that visit, the following information was obtained.

In Japan, the formation of specialized human resources is essential, there are two types of attorneys; General IP Attorneys who are law faculty graduates and Patent Attorneys, the majority of whom are graduated from science and engineering faculty.

The previous contribute to solving those cases involving infringement of patents and other IP rights. The importance of creating an IP High Court takes relevance when having strong applicability of the laws allow to respect intellectual property rights. However, not

all cases go to the High Court, some of them get resolution in the Trial Court of the JPO where the judges have at least five years of examiner experience.

Third regional conference for Presidents and Vice Presidents in Okinawa

This conference was organized by the World Intellectual Property Organization (WIPO) took place on November 2018 in the Okinawa Institute of Science and Technology (OIST); different Presidents and Vice Presidents of Asian Universities and Research Centers participated.

Mr. Satoshi Naguchi coordinator of JPO mentioned that there is a fund from Japan to WIPO from 30 years ago, that has helped to increase the awareness of IP and the importance of promoting the utilization of IP. Mr. Naguchi also appointed that in Japan, accelerate the collaboration between companies-universities is important as a public policy. Companies provide funds to Universities but the collaboration is not sufficiently developed yet in Japan, so it is important to create a network to encourage Industry-academic- Government collaboration.

The Conference focused on the Technology Development, Management, and Commercialization of the intellectual property. Mr. Takafumi Yamamoto from TODAI TLO, emphasized the difference between innovation and an invention; innovation is equal to invention plus commercialization.

The commercialization can be made through licensing the technology, creating a new startup or collaborating with a company. For Professor Oded Shoseyov (Hebrew University of Jerusalem), having a strong patent portfolio is central.

Mr. Toru Homma from the Development Japan International Cooperation Agency (JICA) commented that in his opinion incremental innovation is very important not only disruptive innovation.

In the panel discussion, there was an interesting question: How can you have knowledge integration?

Professor Oded assured that it is essential the interdisciplinary research; the Universities have specialized researchers but they don't talk to each other because they have a different language, so it is important to reduce this kind of barriers. On the other hand, he mentioned that some people expect researchers to be inventors but it is not always possible, a researcher not necessarily have to create different things, but maybe the researcher could combine and work with different multidisciplinary issues in order to solve a problem.

Mr. Yamamoto mentioned as an example the Hitachi-TODAI laboratory in the University of Tokyo. There are three or four researchers in the University of Tokyo, and the company is the one who collaborates with the money. The goal of this laboratory is not to file patent applications but the commercialization. Concerning the ownership, in this laboratory, they do not expect inventions, but in other cases, joint application occurs, in that case, the university always have control of intellectual property rights.

The conference also addressed issues related to the impact of the intellectual property of the university and its transfer of technology.

In this regard, Mr. Oded participated by alluding to the Death Valley, which appears when there is a proof of concept, but the product does not reach the market. From his point of view, the benefit of working in the university is that the students have a cost-effective way to progress the research, he thinks that too many companies are established too early, so it is better to wait a little bit and develop the research. In the Hebrew University of Israel, for example, there are buildings and laboratories with facilities for creating a spin-off and prepare it until is ready.

Mr. Richard Cahoon, who was for twenty years head of the technology transfer office in Cornell University, said that the Universities should not be seen as old fashion Universities, they should have an active engagement in the innovation ecosystem and the economic development. The transfer of technology should not affect the philosophy or the policies of the university; for the contrary, tech transfer should complement the university's mission of contributing with the society.

Chapter 5 : Conclusions and Recommendations

5.1 Conclusions

Previous works have discussed the different ways of commercializing university's research which is a critical issue at an advanced stage of the process of IP creation cycle; also there are previous works which discuss the process of protecting inventions since the discovery of inventions. It is relevant to strengthen the primary stages of the process, as a part of this, the awareness of intellectual property rights become relevant to increase the value of the new science and technology.

Protecting and transferring inventions do not represent the core mission of the university but can coexist without perjuring it; in this sense, it becomes important to respect the freedom of research activities. However, it is crucial to increase the awareness of IP among researchers, so they have the opportunity to decide if they want to participate in the IP cycle activities.

Universities can improve their performance in protecting and transferring knowledge, science, and technology if they have adequate support and if they have interaction with the other actors of the innovation ecosystem.

The National Research System (SNI) in Mexico give incentives for publishing articles more than patenting inventions. There is no conflict of doing both, however, the first one grants recognition in a concise term while the second one not necessarily will provide recognition or at least not in the short term. If we consider that in Mexico, the average time for having a first action of the patent application is four years (48 months); during this time the researcher does not perceive enough recognition, sometimes not even inside the university or with their closest colleagues.

Making a comparison, in Japan, the JPO has been aiming to achieve the world´s fastest and with the most quality patent examination, in average, the first action of patent

pendency[2] at the JPO occurs in the 9.4 months and the average total pendency occurs in the 14.6 months.

It can be said that at least that in Japan, the researchers will be certain of the resolution from the JPO in a very few period of time, while in Mexico they must wait longer, from my point of view, this makes essential to recognize the effort of the researchers for having a patent application, which represents the possibility of obtaining a granted patent in the future.

It is crucial to considerate that not all the researchers are interested in making inventions, and the research should be conducted with complete freedom, but for those researchers who are interested in developing a solution for actual problems in the industry and the society should exist the mechanisms for supporting them.

One of these mechanisms could be helping the researcher with the paperwork, as they are sometimes not only researchers but teachers and sometimes even handle administrative responsibilities, so it is complicated for managing their times. In Japan, there is a job position called University Research Administrator (URAs), which specializes in supporting various research activities, for example, support for planning and managing research projects.

Also, Japan has been successful in increasing the number of IP professionals and expanding IP protection in Japanese society. To promote the awareness of IP it is crucial to develop human resources and educators of IP, but in general, it is also important to provide researchers with specific information of IP that complements their academic knowledge.

Organizing seminars and visiting the laboratories of the universities is crucial for having a close relationship with the researchers, share with them the IP policies, and especially for knowing about their projects and their theme of research.

[2] Patent pendency is the average number of months during the patent application process.

The standardization of the IP Office becomes relevant in the Universities; it is important to develop technology transfer manuals, contracts, disclosures, policies and procedures to manage all kinds of situations that could come up.

Another critical element is that the researchers should understand which are the demands and expectations of the industry and society, that is vital. Mainly, it is imperative to activate the collaboration between the academy and the private sector in order to connect the research results with the needs of the industry; the clarification of the goals of the collaboration is required in order to establish the scope and limitations correctly. The final goal is not just collaboration between academy and industry, but the contribution to the society.

There must be support and certainty about the processes of protecting and transferring inventions in the university, the clarity of the Patent Policy is vital, it helps the researchers to approach and follow the process in conjunction with the university.

The most important should be to utilize the inventions. Sometimes, it is complicated to choose which research or technology should be protected by industrial property rights taking into account the criteria of market potential, usually, just after the patent application is possible to find out if the technology will succeed in commercialization or if will end up as a discarded patent. It is highly recommended to considerate in the process of the decision making the development state of the technology.

The university´s inventions have a low stage of maturity and devolvement, and sometimes not according to the needs of companies, most of them are far from commercialization. One option for increasing the development of inventions is the collaboration with companies, for example, through a Joint Research Agreement.

According to the interviews, sometimes even in Japan the times of the university does not line up with the times of the Industry, but is a task of the universities to build the conditions of cooperation, is part of transforming the ways of collaborating and it should consider different possibilities.

An essential element of collaboration between universities and the industry is the trust on the relationship; the Industry should fairly recognize the capacities and give value to the

research, in the same way, Universities should respect times and listen to the expectations of the Industry.

It is desirable to have companies which understand the mission of the universities and could trust and invest in their technologies, companies which are less averse of high risk and more willing to invest intending to obtain investment benefits in the medium and long term.

Platforms for university-industry interaction are necessary; new technology presentation meetings, university technology exhibitions, and Open Innovation Seminars are important for fostering industry-academia-government collaboration.

Recognition of the inventors and incentives become also is very important, the demonstration effect of both, makes the difference. Japan has very successful cases but has failure cases as well, from both, there are important learnings. Convince the researchers is not easy, so it is necessary to accumulate successful experiences in order to boost IP activities between the researchers.

Japan focus on the Universities after the great recession in 1990, but focus in the university as a contributor of the society and not only as an academic institution providing education services.

Before 1997 the Japanese universities did not have many patent applications, which did not mean there was not research protected by patents, but usually, the researchers did research through industry collaboration, so the researchers filled the patent application with the companies without including the university as co-owner. The previous changed with the approval of the TLO system but also with the establishment of the Bayh Dole Act in Japan that allowed the Universities to protect their research output through industrial property rights.

Twenty years after having started with the goal of being a country based on intellectual property, Japan has had important achievements. However, it continues to improve the strategies previously implemented. Universities have special attention in these strategies and have received various support from the beginning; the industrial property rights are

one of the tools that contribute for the university to achieve one of their main missions, to share knowledge with society.

The strategy for supporting the universities has included not only the modification and enactment of specific laws, but also different platforms were facilitated to support the strategy, specialized databases, training courses for human resources, the coordination of processes for the protection of industrial property rights, and others. It has been an integral strategy for achieving different results in all the actors of Japanese society.

Japan remains with the objective of being a frontrunner country when it is about Intellectual Property Rights, one key element of the success in the country is the capacity of different Institutions of all levels (public and private) of working together. As an example, on June 2018, Prime Minister Shinzo Abe held a meeting of the Intellectual Property Strategy Headquarters; as a result, they approved the new Intellectual Property Strategy Vision and the Intellectual Property Strategic Program 2018. In this event, Prime Minister appointed “Japan will lead the world as a cutting-edge intellectual property-based nation going forward. I would like the relevant ministries and agencies to work as one and move resolutely toward the execution of bold and concrete policies, including strengthening support for small and medium-sized enterprises and start-ups, developing highly-creative human resources, providing support for the overseas expansion of Japan’s high-quality agricultural produce and contents, and further spread the Cool Japan strategy across the world (Prime Minister of Japan and his Cabinet, 2018)”.

The previous reflects how much commitment has Japan to be an intellectual property-based nation, how the strategy is integrated and permeates in all the relevant agencies. In the case of Mexico, there are efforts to promote the protection and use of industrial property rights; these efforts have not managed to permeate at the national level, on the other hand, there are important isolated efforts in some states.

However, a comprehensive strategy is required for the entire country that allows generating an awareness of the protection and use of industrial property rights. Primarly it is required in the Universities since they play an important and vital role in the generation of scientific and technological knowledge.

Therefore, it is important to promote and increase awareness of industrial property rights in university's professors and researchers, regardless of whether they develop basic or applied science, it is essential that at least, they consider the possibility to protect their research by industrial property rights, and through these rights, would possibly generate a positive impact on society and even generating economic resources for future research.

5.2 Recommendations

The following practices are recommended to evaluate for possible application in universities in Mexico; these practices contribute to promoting the protection of industrial property rights among university researchers, all of them were obtained from the previous information provided by the interviewees, from the literature review and the lecturers of conferences and short training courses.

- **Spread successful cases:** To spread IP awareness is vital to tell researchers successful and no successful cases. It represents an excellent option to make a publication of invention in a website, cover the case by local newspaper or organization, and diffuse in local seminar and symposiums with the community.
- **To have a review panel expert:** For deciding with impartiality whether or not to file a patent application, could be good to have a panel review or a committee that at least take place once a month. An option is to consider one external member with experience from the industry in order to advise about the market, this could be a retired person so that there are no conflicts of interest.
- **Boost university-industry collaboration:** Consider different types of collaboration (e.g., Joint research labs, collaborative research) would help to clarify the purpose of the collaboration, that could contribute to building a good relationship between the companies and the university.

In a joint research scheme, individual or a small group of researchers can offer technical advisory or consultation to other organizations. In a collaborative research project, for example, it is important that the project has at least two years' duration, with a maximum of five years. Regarding this point, it is important to reduce bureaucratic process, unnecessary paperwork and times for responding to the industry needs; the resources

for the university-industry projects should not be operated with the regular times of the fiscal year, but with the flexibility of times considering the particularities of the project.

In collaboration with the companies, when there are intellectual property rights involved, it is recommended that the university should keep the control to avoid possible problems in the future to agree on how to transfer the technology.

- **Institutional Proof of Concept Program:** The implementation of an institutional proof of concept program beneficiate the university in different ways. One example of this program that could be a good reference is the Proof-of-concept (PoC) program of Osaka University.
- **Train University Researcher Administrators:** In Japan, the University Research Administrators (URA) help the researchers; they could support the researchers so they can focus on research. Also, URAs could facilitate the collaboration with companies and other national and international institutions, simplify to obtaining external resources to the university, but also could improve the communication between the researchers and the managers at the universities.
- **Develop educators and increase human resources with IP knowledge:** It is important to offer seminars, lectures, and courses of IP. Visit the laboratories at the university and provide special seminars is useful for spreading the IP mindset among professors and researchers but also for knowing their research better.
- **Support Startups and Spin-offs:** In recent years, Startups and spin-offs have taken relevance, these companies constitute a way to develop inventions and to make use of inventions for the solution of specific problems. In Mexico, it was a significant step the amendment of the article 51 of the Federal Law of Science and Technology in 2015, which eliminated the conflict of interest for researchers, the challenge is now inside the universities for establishing the process and policies for supporting the creation of startups and spin-offs.
- **Provide incentive schemes:** There are different schemes, one of them is to include IP applications and registrations in the metrics of the performance evaluation. Recognize inventions that are already used for solving problems in society is very

important. Offering a percentage of income of royalty fees and provide an economic award to inventors constitute another possible scheme for incentivizing researchers.

Regarding the last point, from the personal experience of the author, an economic award is one way to motivate researchers to protect their inventions, but it is not enough by itself. It is essential to accompany it with a professional advisory that facilitates the process of prior art search, the specifications drafting and the process for filing an application. As an example, it can be referred the Program for the strengthening of inventions for Institutions of Higher Education or Research Centers in Jalisco[3], which was launched in Jalisco state in Mexico in 2015 by the Secretary of Innovation, Science and Technology (SICyT) and the State Council of Science and Technology of Jalisco (COECYTJAL).

The objective of the Program is strengthening the inventions in Higher Education Institutions and Research Centers in Jalisco, and it provides financial resources for the following purposes: Cover Patent Office's fees, hire Intelectual Property Firms for advisory and granting an economic award to the inventors.

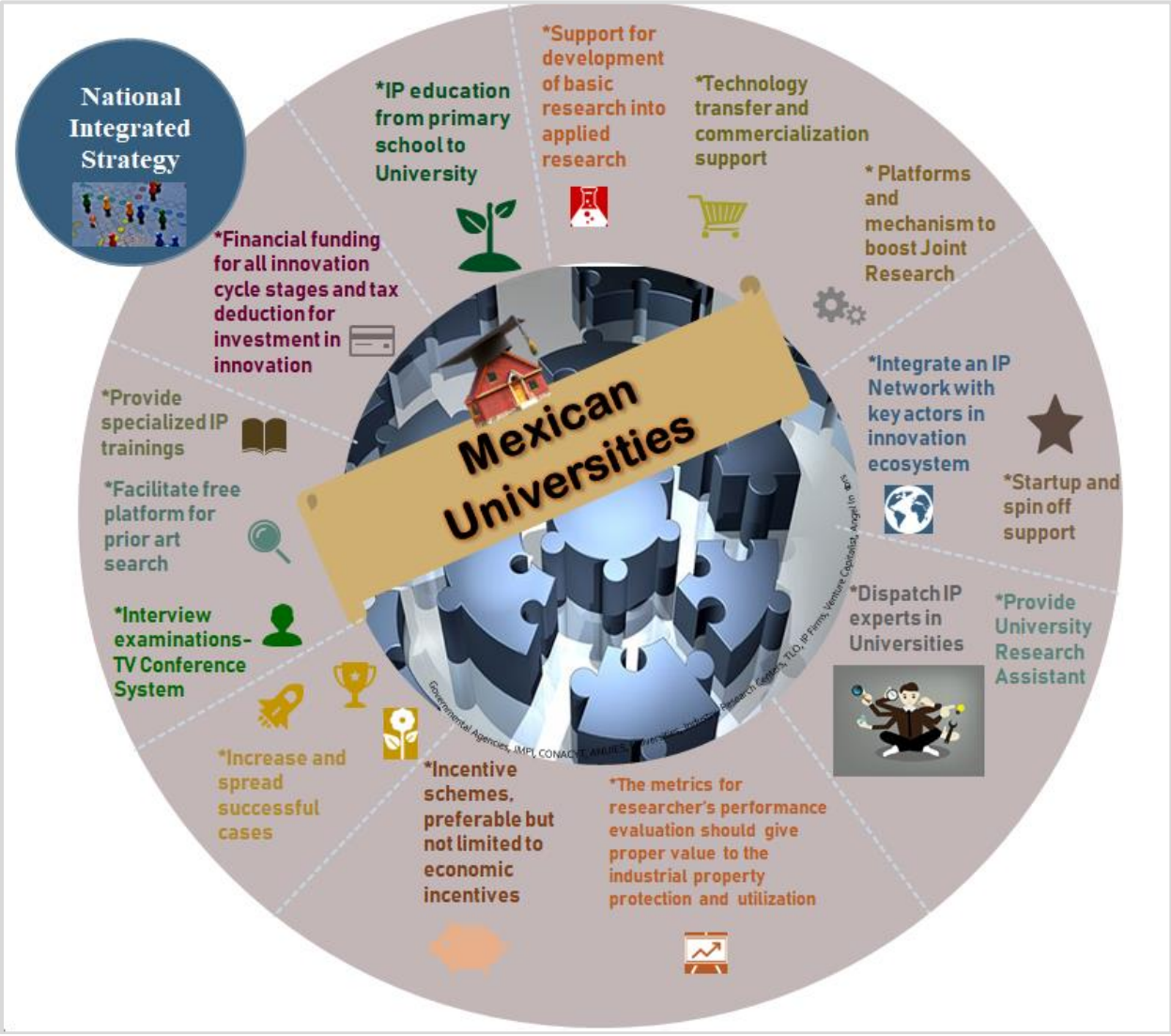
As the program from the SICyT has been successful, it could be considered to design and implement this type of program in other states in order to foster the protection of inventions.

Notwithstanding the above, a national strategy is required to foster IP awareness in the country, the strategy should consider special needs of Universities in all the innovation cycle, the reinforcement of policies, and the creation of specific programs and projects, but must take into consideration the advice of IP people from the academia and the industry.

As a summary of the results of this work, the following figure shows an ideal scenario for Mexican universities, that synthesizes the support that should be considered in a strategy that integrates diverse programs to strengthen not only the protection of inventions but the transfer of knowledge. All those mechanisms could impact directly and indirectly to

[3] Available for consultation online: http://www.coecytjal.org.mx/Plataforma/convocatorias/propin%20ies%20y%20ci%202018/Convocatoria%20IES-CIP%202018-2019%20V2.pdf

increase the awareness of industrial property among the professors and the researchers in universities.



Source: Own elaboration with data obtained from the Four-Month-Study-Cum-Research-Fellowship-Program in Japan

Figure 13. Elements for supporting Mexican universities for increasing the protection and transfer of their inventions.

Specifically, in the following table, there is a proposal of actions and measures that could be taken by the University of Guadalajara in the short, medium and long term in order to increase the awareness of industrial property rights among the professors and the researchers, and foster IP activities, and the transfer of knowledge.

Table 6. Actions and Measures for the University of Guadalajara.

Actions and Measures for the University of Guadalajara		
Phase	**Objectives**	**Outcomes**
Short term	• Emphasize the continuity of specific lectures and training of human resources in IP (Top-bottom management). • Offer lectures of intellectual property rights. • Focus on promote the utilization of university's patents and generate successful cases. • Propose the integration of a Panel to evaluate industrial property assets. • Program for developing prototypes and proof of concept.	• The top management people will be aware of IP; IP will remain as a priority despite changes in the structure. • Design an intellectual property course in a master's degree in innovation. • Update the platform in order to boost the collaboration with the industry, including information of IP. • People with industry experience would advise about the market of inventions.
Medium term	• Hold monthly seminars and make plan for visiting labs and Research Centers. • Actively participate in Red OTT in Mexico. • Proposal for including IP courses at graduate level in medical, engineering, and biological sciences. • Introduce the idea of different types of collaboration, so UDG can align times with industry. • Standardization of the IP Office	• By the end of one year all regional campuses and the thematic campuses of hard sciences will have at least one seminar. • IP courses will be included at a graduate level. • A specific proposal and conditions will be considered for collaboration with government and industry. • The members of IP Office will be coordinated in standard processes for commercialization work.
Long term	• Proposal for including IP courses at undergraduate programs. • Seek for additional supports for the development of prototypes, the creation of startups and spinoff. • Proposal for establish in UDG the policy of equity professors in companies.	• All programs at UDG will have at least one course of IP • Certain conditions and support will be given for startups and spin offs.
Source: Own elaboration with data obtained from the four-month-study-cum-research-fellowship-program in japan		

5.3 Limitations and Future Research

It is very important to take into account the estate of the industrial development of the country, so probably some strategies, programs, and actions which were successful in Japan will not be applicable or convenient in the context of Mexico. Even the scale, size, and particular conditions of the Japanese universities should be considered for the interpretation in this work, that matters if some of the conditions described in Japanese Universities would apply to the circumstances of the universities in Mexico. This work should be interpreted in a very comprehensive manner.

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Appendix 1

Interview with Mr. Kenichi Hatori

Executive Director, University Network for Innovation and Technology Transfer (UNITT)
Former Professor
Graduate School of Science and Technology
Keio University

Date September 12, 2018
Place UNITT Office
Time 15:00-17:00
Participants Mr. Kenichi Hatori, Dr. Yori Suwa, Monica I. Garcia

Introduction

Mr. Hatori was so kind receiving us in his office, he started giving me some relevant data of IP in Keio University.

He mentioned that it was Yuichi Fukuzawa who in 1867 introduced the Patent European System in Japan. And some years before (1858) founded a private school called Rangakujuku, the predecessor of Keio University.

He also mentioned two important governmental programs of the IP strategy.

In 1998, the Approval of the TLO system. Before this, in 1997 the Universities didn't have much patent applications, usually the research was with industry collaboration, so the researchers filled the patent application with the companies.

This change also with the establishment of the Bayh Dole Act in Japan that allowed the Universities to protect their research output through industrial property rights.

In 2000, Industrial technology enhancement act. Which included the possibility for researchers to become CEO or CTO in a company and also Startup.

Questionnaire

1.- How do Japanese universities motivate, encourage and support their researchers to protect their inventions?

1.1.- Which successful programs have been implemented by the University to spread the knowledge of IP among the professors? Do these programs also include the dissemination of IP among students?

One of the most important action was to structure Patent Policies, each university has different principles of Patent Policy, but there are three main parts: Disseminate, disclosure and the determination of file the patent application.

Inside the Universities, Technology Transfer experts should spread the Patent Policy and educate teachers and researchers.

Keio University often had seminars to explain the patent policy and explain successful and not successful cases. Even though, few researchers attended the seminars.

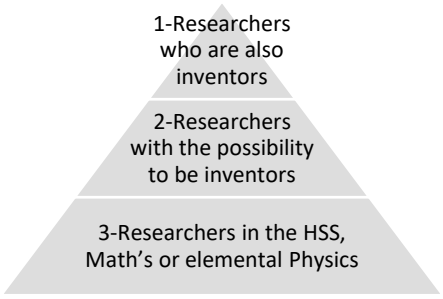
On the other side, Mr. Hatori's previous experience in the Japan Advanced Institute of Science and Technology (AIST)[4] was different, while he was working as the head of IP Office, all the researchers of more than 40 units that AIST has, attended together the seminars for communicating the patent policy.

1.2 Currently, could it be considered that IP awareness among the university's researchers still being a problem?

In my opinion yes. Almost 20 years have passed, and after all the seminars to spread IP rules or patent policy to researchers, they understand the rules, they remember, but most of their inventions are not utilized by society, so there has not been successfully procedures for commercializing inventions.

How often seminars were held in Keio University?

There were seminars two or three times every year in medical, sciences, technologies, and Humanity and Social Sciences (HSS) campus. So it is considered IP awareness still being a problem, but also depends on the researchers, there is group of key researchers in the University who are also inventors (top of the pyramid). There is another group of researchers who has the possibility for being inventors, but some of them abandon the process after the invention disclosure was not accepted for present an application (middle of pyramid). There are also researchers in the HSS, Math's or elemental Physics (bottom of pyramid).



1.3.- How much is the budget allocated to promote IP activities? What promotion activities can be carried out with a limited budget?

There is a huge cost of patent filing, specially the cost of hiring a patent attorney form outside the University. There are no human resources inside the universities in almost all Universities in Japan.

One patent application cost about 200,000 yens.

If there is a seminar, the best way to disseminate the IP role is that the technology transfer expert have communication with each researcher. Another effective way is to have one successful or unsuccessful case to disseminate IP.

[4] The Biggest National Research Institute in Japan.

Because in seminars just small number of teachers will come, so is better that the TT expert visit the researchers personally.

The budget for IP activities is also to hire the Tec Transfer person.

1.4.- Is there a national evaluation system for researchers in Japan or at the University which is taken into account to consider that a teacher's research output is relevant?

Submitting a paper is highly evaluated, more than teaching.

In Keio University there are 3 main missions:

- Teaching mission

- Research mission

-Providing research results for the benefit of society, but this depends on the researchers.

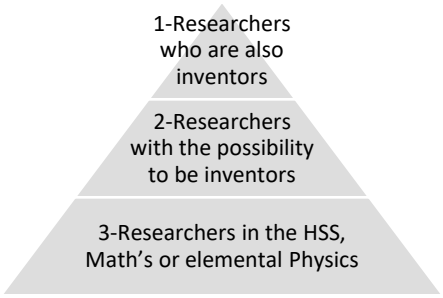
1.5.- It is common in Mexico for researchers to carry out several activities at the same time (research, teaching, and management activities), at the University, are there incentives to reduce the activities of teachers who develop science and technology and let them focus on research?

It is the same in Japan, many of the researchers do this 3 activities and ins the same position.

The Japan government introduced by the Ministry of Education the University Research Assistant (URA), they support the researchers and make possible for them to concentrate in research activities.

1.6.- Do you consider that in Japan the effort of the researchers to protect and try to commercialize the results of their investigations is valued and recognized?

Depends on the professors. The professors on the top of course, professors in the middle is not true, they are not recognized like the teachers in the bottom of the Pyramid.



2.- What are the most important factors which the professors should know for protecting and commercializing the research output?

2.1.- Which support and advice does the University should give to the researchers from the invention discovery to the commercialization?

University must set the patent policy to file a patent application and commercialization.

It is important to spread these ideas by the TT expert or someone else from IP Office, they have a very important role providing capacitation and asking the researchers if they have inventions while show them some examples of successful and unsuccessful cases.

2.2.- How vital is that the researchers evaluate the possibility of protecting science and technology before publishing in a journal? Which is the average time for filing a patent application?

This depend of the researcher. For example, Professor Shinya Yamanaka who was awarded with the Nobel Prize in Physiology or Medicine in 2012, decided to file a patent application in Japan in 2005 before publishing his first paper related with pluripotent cells from mouse embryonic in august 2006. At the end of the year 2006, he made the PCT application and one year later, his second paper related with pluripotent stem cells from adult human fibroblasts was published.

2.3.- How does the University assess the importance of Patents, utility models, and industrial designs? Does the University hire external IP firms for filing applications of industrial property rights?

For commercialization work is very important to hire people with experience from Industry.

2.4.- If the University decides not to make the patent application, grants the teacher permission to use such research?

Yes, but sometimes is necessary to check if the invention was from a big government fund, if so, there is sometimes a description agreement between the funding institution and the university, and the university should utilize the invention for commercialization.

In this case the teacher is not allowed to make use of the invention, the university returns it to the government and the government checks if the university did its best effort to utilize it.

If the invention was not created primarily with a government fund, then The University returns the invention to the professor.

2.5.- How does the university attract funds to bring technology to the market without bureaucracy?

The fiscal year is from April to March, a year long. Sometimes you can use the remainder of the budget for the following year, and if planned the budget can be used for two years, but usually is from April to March, is not restricted.

2.6.- How could you describe the collaboration between the university and the local industry? What is the fiscal year in the universities?

It is a good idea, sometimes government proposal to local district is that one University to enrich local industry.

In Japan to enriching local industry is a very important thing and it is expected local universities to make it.

This collaboration is very important but if we limit only in this collaboration we could lose the chance to utilize universities patent right for commercialization because sometimes local industries cannot utilize it, but industries in other area can. So it is important not to concentrate in local industry.

3.- Which is the best practice in your experience as the university IP person in which IP rights provide more value for the research?

3.1.- Could you please mention a successful case where the industrial property rights increased the value of the science or technology research?

Successful case 1 (License example)

New in vitro diagnostic and measurement kit against autoimmune disease systemic sclerosis (SSC).

Dr. Masataka Kuwana, invented a diagnostic agent for scleroderma.

It took ten years to bring the technology to the market, in this case, Keio University paid all the research expenses and the patent application in Japan and the United States.

Successful case 2 (Start-up example)

V-Cube

The inventor is Mr. Mashita, who was student at the time he developed the invention. This technology is a web meeting system and is the number one of using for internet conferences in Japan.

The company expanded in Malaysia in 2009, Osaka in 2011, Singapore and Indonesia in 2012, and Tianjin, China in 2013). The professor hired more than 40 people in Singapore.

Successful case 3 (Start-up example)

IDEAQUEST Inc.

Dr. Masato Nakajima invented a non-contact monitoring system for people with dementia.

The Professor made so much inventions, after 65 designs he had to start up with his student.

The Professor was over 65 years old, he was retired from Keio University, and his student around 40 years.

By the time this invention was licensed, but the company did not commercialize it, so the professor bought the industrial property rights from the company for utilize it in his startup.

The system was introduced in care houses; the government support the budget to have this system.

Government paid ¾ of the care houses for having the system.

The key point is to start up.

Successful case 4 (License example)

Orange 2-Generative System of Handwriting Fonts

The invention of Professor Nakajima allows to turn your handwriting into a font in a very simple way, giving the creative freedom of customizing the font collection for the letters, mailing labels, name cards, web pages, diaries, or essays.

Successful case 5

Real Haptics Intelligent Robot Hand

Professor Ohnishi invented a system to feel the surface and transfer force through internet.

This patent application was made first in the Japan Patent and then the PCT was filed.

For example, the Tofu sweet, robots cannot grab it because they destroy it. But with this invention the robots can grasp objects softly.

After one year, we open the close strategy. The professor didn't want to publish everything, so the invention had a very complicated password that not everyone could understand or discover how he did.

So, we open the invention in PCT, so we had closed information that anyone can open. This was only by using a chip. This was the best strategy.

So we had open and close strategy.

Some company utilized the chip with the program included and made some apparatus for the company. The professor decided not to sell the chip, he allowed the companies use the Chip. Then, if the company use it and successfully make some practically in production or work, the professor will have some license fee.

At the beginning he didn't want to get money. So the best strategy was to give the chip to the companies so they can develop prototypes and then when the prototypes worked with the chip, the University and the professor would receive a licensing fee.

3.2.- How relevant was the support of the university staff to guide in the protection of the invention?

The protection of the inventions is an important thing so should be guided by technology transfer experts, which should meet with researchers and explain come successful and not successful cases. They must be helpful in guiding the protection of the inventions.

3.3.- Which were the factors that made possible to market the invention? In this case, existed a research collaboration agreement with the industry or another public or private Institution?

In some cases, research collaboration is not good for university. The University should have 100% of patent rights and base on this background inventions, the University should make collaboration.

If the University does not have 100% of the fundamental patent, then it is shared between the University and the Industry. The University does not produce any production, so only can utilize patents through a third party. In patent law it is stablish that University cannot utilize the patent without the third party. So in the technology field it is better for the University to have the 100% of the patent rights.

3.4.- In this case, did the research was previously oriented to the market needs?

In the last successful case, the one related with the robots, the invention was university research for transfer force, and the professor did not see any application for it, but after he recognized that the technology could be utilized in the industry.

According to my experience, just few researchers make market research, most of them concentrate in their field and do not make market research.

3.5.- Do the commercialization of research output brought financial benefits to the researcher? Was there some other benefit or recognition for the professor, his research or his laboratory?

In the cube case, the researcher hired 40 workers, he made a lot of money, he went to Singapore and he succeed.

In the medical case probably the professor did not succeed so much because this patent was a detecting kit, and this has a big market, so he did not get much money.

In the robot case, the collaboration with the companies could get much money for the professor.

3.6.- Do you think that this successful case encourages other professors to use the IP rights to protect their research outputs?

Yes, it is very important to spread successful cases to many researchers, the goal in Japan is to bring professors on the middle of the pyramid to the top.

Professors have an IP mind but sometimes they do not consider it.

Pd.D. Suwa: Who made the open and close strategy?

I supported the commercialization and patent application, and I told them how to protect the know-how (code program). It had to be secret, so the professor asked a company to install the code in a chip, and he executed it, he setup the system.

At that time, I was substantially in Keio University, I was working in growing a new kind of doctoral student, it was a special program for the government (Ministry of Education).

Appendix 2

Interview with Ms. Kiriko Abe
Assistant Professor, MEng, MBA
Innovative research & Liaison Organization
Shinshu University

Date September 28, 2018
Place APIC
Time 10:00-11:30
Participants Ms. Kiriko Abe, Ph.D Yori Suwa[5], Ms. Tomoko Uno[6], Ms. Mayumi Yoshida[7], Ms. Monica Isabel Garcia

Introduction

After Ph.D. Suwa mention the objective of four-month study cum research fellowship program and pointed out that I am one of the researchers of the program this year, I introduced myself, the main problem, and the topic of my research to Ms. Abe. Then, Ms. Abe started talking about Shinshu University.

Ms. Abe: Shinshu University is one of the government old Universities, there are over ten thousand students and the number of the researchers are about eight hundred. I am the manager and supporter of research administration and IP Management. This is my second year at Shinshu University, before working for that University I experienced working for four other Universities including Keio University, and in all of this positions I have been handling IP.

Then we continue with the interview questions.

Ms. Monica: The first four questions are related with how do Japanese universities motivate, encourage and support their researchers to protect their inventions.

And the first question that I would like to ask you is: Which programs and activities have been implemented by the Government and the University to disseminate the awareness of IP among researchers in Shinshu University?

Ms. Abe: Shinshu University provides a monetary award for the researcher who has created inventions. It is not a big amount, ¥5,000 per application and it is provided at the application. There are some other Universities who do the same but they do so when the patent is registered.

Ms. Monica: Since when do you have this monetary award?

Ms. Abe: Since 2004 when the government allows a University to apply for a patent, before then it was handled only by the government.

Ms. Monica: In Mexico, it is common for researchers to carry out several activities at the same time (they have to give lectures, they are researchers, some of them are managers). At the University of Shinshu, are

[5] Senior Researcher, APIC, JIPII
[6] APIC, JIPII
[7] Conference Interpreter, Intergroup Corp.

there incentives to reduce the activities of researchers who develop science and technology and let them focus on research or this is not happening in your University?

Ms. Abe: There are two incentives schemes that we implement in Shinshu University. One of them is that there is a performance report that each researcher has to submit, in that report normally in other University only the number of academic publications and the number of presentations made at academic conferences are scored. However, in our system they can also score the number of patent applications and patent registrations. And this score affects actually their promotion and the compensation increase.

The second incentive is that once there is a revenue for the University as a result of the patent, for example license fee, we have a system to pay the incentives to the inventors, for example when the revenue was made, then the University deduct the application cost from it and what remains, split to the inventor and the University. In such cases, the University gets 60% of the remaining monetary amount and the inventor will get the 40%. So, in short, deducting the cost, 60% to University, 40% to the inventor. And, if there are more than one inventors, we can split the 40% according to the level of contribution.

Ms. Monica: I just want to say that in the University of Guadalajara we also have the same scheme, 60% to the University and 40% to the inventors. And, probably my next question is related with the fist incentive, as a context, I would like to say that in Mexico we have a National Researcher System that evaluates the performance of the researchers and also take into account the academic conferences, the publications, the number of patent applications, but the truth is that for this system is more important the publications in journals than the patent applications and even the patent granted. So, in Japan, how valued and recognized is the effort of the researchers for protecting and commercializing the results of their investigations related with this performance evaluation that they have to make?

Ms. Abe: This is our researcher performance, the evaluation scheme and all of the item list, and where is the fixed scoring system. So I rather say is a fixed scored system, for example, when an academic paper is published, three points is awarded for a publication; for an academic presentation at a Congress, four points; for a patent application, two; and once registered, one point is given.

Ms. Monica: Thank, I'll continue with the next question. Currently, could it be considered that IP awareness among the university's researchers still being a problem?

Ms. Abe: Nationwide there are 23% of the researchers who apply for patents among other inventors and for my University it is likely less than 20%. But, I personally think that we have to raise that percentage. What I think is the issue is on the side of the awareness of the inventors. There are some of the researchers or inventors who tend to be sloppy in the procedure. Although they understand that need to protect the invention and they want to protect their inventions. For example, they wrongly publish the invention before they apply, and the way they check the document is not good enough. So, in such a way they sloppy in terms of the process although they understand the needing of protecting their inventions. I think this is our issue.

Ms. Monica: Is an issue also in Mexico. So, I would like to ask a question, do you think that this evaluation performance that gives more value to publishing papers has anything to do with this, that the researchers prefer to publish before they protect?

Ms. Abe: Both of them are awarded with a score, the patent application and academic presentation. There is a system like a grace period system in the United States, also in Japan, after one year of the academic publication or presentation you can still apply for a patent. So, the researchers wrongly interpret that system and they do not assume any issue in applying for a patent after making an academic presentation. However, from business side that involve risks in commercialization and there are some aspects of that

system that are against commercialization, but the recognition of such risks are not so strong of the side of the researchers.

Ms. Monica: Thank you very much, so, we go to the second part of the questionnaire and this is related with what are the most important factors which the professors and researchers should know for protecting and commercializing the research output. The first question in this section is: How is the procedure to determine if the University will submit an application to the patent office?

Ms. Abe: Let me explain the procedure, first, the inventor, the researcher gives us a notification and request that it should be applied. And then we go to the IP review panel, that is a regular panel; there are IP review panel for engineering and IP review panel for life sciences, both taking place once a month. The panel is participated by our University professors and our IP officers, less than ten members. And then in the panel we will decide whether or not file for an application for a patent based on the value of the application and whether or not it is an important research for the University and once the decision is made to file for an application then our IP department will ask for the IP firm to arrange the paperwork and then the application is submitted to the JPO.

Ms. Monica: And, what If the University decides not to make the patent application, the researcher has the permission to use this research or protect it by himself?

Ms. Abe: Once the decision is made or not to apply for a patent as University, basically it is up to a researcher or inventor. The researcher can apply for a patent on an individual basis without any support from the University or he or she can ask for a business to support the application. It is basically free and at the discretion of a researcher. But the point is that once the University decides not to apply, he or she cannot get any support from the University.

Ms. Monica: As the value of the research is important, I would like to know how does the University asses the importance of patents, utility models and industrial designs and, if the University hire external IP firms for this purpose.

Ms. Abe: Our decisions are all internally made, we regard three to four patent attorneys in University and also they are allowed more experts or specialist in the University. The important decision making point is that if the University gets some fund or grant based on the contractual agreement, for example government subsidy or the subcontracted work from the government or if the invention is generated as a result of the collaborative research with businesses, then University will be held to accountable because the contract is arranged by the University, then our decision tend to be that we will apply for the patent. Also, if the inventor is a professor who has a major and a very good patent which has generated a lot of money out of the patent, then our decision tends to be yes. And on the other side if the inventor is a young junior professor who has not made any history, then our decision may not be in favor of that young professor.

Ms. Monica: My next question is how important is that the researchers include the patent information in their research? Probably I should explain, some of the researchers do not make market research before they start a research, and sometimes they also base their research mostly in papers and not in patent information, do you consider that this is important?

Ms. Abe: The short answer is that we don't see a lot of importance in including the patent information because if the patent information is included in the presentation package or academic publication paper, then, if the business is interested in that research they will contact the researchers. However, if that information is not included, they will contact and be interested anyway. If there is a government fund as a result of the effort to commercialize or utilize the invention, the offices working for the fund always are

watching over if there are any interesting inventions. In such cases, if the patent information is included in the paper, may be easier for the invention to get recognized by such government offices. However, the short answer of this idea is not really.

Ms. Monica: In your opinion, do you consider that the researchers should protect their science and technology before publishing?

Ms. Abe: We don't recommend that everything should be protected, but I would like researchers to be aware of their patent possible commercial value. So, what we always ask researchers is contact IP Offices if you think that you got an interesting invention. Just a call, don't thinking too much about it, and if you think that your invention is something interesting, do call us, just give us a call before publishing it, we ask the researchers not to think too much about it because if they think too much about the value of the invention on their own they tend to consider that is worthless, while it could not be worthless.

Ms. Monica: The last question on this section is: How does the university attract funds to bring technology to the market? And, I would like to know if inside the University is this process bureaucratic?

Ms. Abe: Our primary effort is to access the market so that we can get a huge fund, it is important to attract a huge fund and it is also important to invite businesses in commercialization. It is not paper based work or it is not only based work on the email effort. What we have to do is meet people and let them think that our research and inventions are interesting. And, if we can successfully raise interest, then we can find a deal and the last step is the paper work. So, it depends on each situation, sometimes we need arrange our team, and we have to find an excellent coordinator, and we have to launch sometimes a project. And, the most important, it is not bureaucratic at all, it is people facing work.

Ms. Monica: I would like to start with the third section of the questionnaire, this is about which is the best practice in your experience as the university IP person in which IP rights provide more value for the research. Could you please mention a successful case where the industrial property rights increased the value of the science or technology research? How was the procedure for protecting and commercializing the invention?

Ms. Abe: I would like to say one example which actually has not resulted in a huge success in terms of commercialization because the product is not selling well but we consider this has been some level of success in the application procedure. There was one University that I worked for before and there was another University in the neighborhood. Professor A was developing a sensor for measuring instrument, and there was another professor in another University, professor B, who was developing a real time patient Monitor which is used in operation and I thought the sensor of professor A, could be used in the patient monitoring system and when this two technologies work combined, the things worked the more and more complex, and I realized that additional technology was required. So, I found one business and with that business as a result, we had to launched another patent application. However, when the owner of patent increases, the process gets more complex and it is not a good thing, so the business said that they don't need the patent. And then, we developed the instrumentation of the product and as a result, in the process of developing the end product, we realized that we no longer needed the initial technology developed by professor A, the sensor technology, and we actually wanted to replace that technology with another technology which was developed by another business and that technology, the new technology developed by that business was patented. However, the initial company (company A), negotiated with that business quite well and actually successfully did them give up using the patented right. As a result, that technology became open, so that anybody can use it. And the businesses negotiated with the other businesses that the technology could be used by professor B, who is a doctor. So, for the purpose of

getting better outcome out of the operation or the surgery, as a result we can reduce the stakeholders to one University and three businesses and the product was launched to the market.

The first company who developed the sensor actually the result cannot benefit with that patent at all, they considered selling software to the end product. However, it has, didn't fly, and it has involved research and development the third and by the day they are not able to benefit in a monetary term from the deal at all. However, so passionate about bringing the deal to the end. So, other participating businesses became hesitant to have a say in the negotiation. As a result, we were able to simplify the contract, the contract became less complex and with less demanding clauses. In other cases, I experienced the law, there are similar deals that have a multiple number of businesses that has result in the cancelation of the agreement.

Ms. Monica: Thank you, the next question is… What benefits did the researcher, the university and the society obtain with the commercialization of this invention? I mean, it was probably not successful in commercialization but there were some benefits?

Ms. Abe: First of all, there is a 40% of incentives that I explained already and when in the process, the researchers, the inventors go with businesses, typically they will launch a collaborative research, a project, and then typically they will get huge research fund, externally. And when a commercialization project goes in that way because commercialization and industrialization have long been in one of the University's focus, we can publish what is going on in University magazines, also we can carry a press releases on University website and it could be covered in the newspaper as well. And, we can arrange seminars and symposiums in a local community as well, and as a result that will help the researchers feel that what they are doing is valuable. And, they can enhance the presence in the community and research arena. At the end, our University's recognition will be enhanced as well.

P.h.D. Suwa: What happened to the sensor deal?

Ms. Abe: Actually about the University researcher at the Hamamatsu Medical University, he is not treated as a representative case of business-academia collaboration effort. Although the product itself is not selling well, what happened is that the researcher was associate professor at that time. However, as a result of that deal, he was appointed as a head of Medical Device Development Research Center, which normally is filled by a Professor, and after two years he was promoted to a Professor and now, this year is his third year as a Professor. He is now acting as a Director for Business-Academia Collaboration. And some people says that in the long run he would become the President of the University. He kept a very low profile and he was having issues, he felt that there was a challenge in surgical filter and when the sensor deal came to the University he was just listening, he just wanted to listen what they've got. And, he was surprised to have heard about such a nice sensor and he paid the effort. That ended in him having such a good attitude and that ended up by just being promoted to Professor and which paved the way for the President of the University. Without that deal he may be still in associate professor position and this is a plain example of the deal that in the long run has increase the presence of that inventor. The name of the Professor is Doctor Seiji Yamamoto.

Just to clear, when I was working for Hamamatsu Medical University and the sensor's professor was working for Shinshokan University in the same prefecture. And the doctor had such a nice personality and the participating businesses were paying and making the effort to let him get involved in the deal. Actually the businesses were eager to launch the product, probably because of his nice personality. Now, he has started a position that when somebody get interested in making a medical device they would come to the professor for consultation.

Ms. Monica: The third question of this section was about mentioning a non-successful case for protecting and commercializing, but we can consider the example that you just mention and probably if you would like to make some recommendations about the lessons learned from this case.

Ms. Abe: There are many failure cases, but not all of them, there are many cases which have failed, however they are not treated as failure cases. First of it, what we have to get is to get fund from the government and which normally goes quite successfully and we can launch a project quite successfully, and the project will land three to five years normally, but quite often, they do not go further, they cannot make any progress. What happened in that stage? Typically, what happens is that one business wants to modify the specifications, and one want to filled in the technology and they want to make an input that this should be like this, and they want to do certain search. The researchers tent to be very stave on and insist on particular direction of the research for example, that will result in a gap that will only wide in time and in the last stage of the project. In such a project is quite a difficult for all the stakeholders, they are counting time, how many days are left to finish of the project and from such a project, the best we can only expect is a prototype. And by rule the project will fail in attracting people, and as a result the stakeholders do not want to communicate with each other and they don't want to spend much time and effort in the project.

So, in a project like this, businesses get themselves involved in an expectation of revenue and profit and they do not think deeply about the scenario of successfully fly, so when they realize that they cannot get an easy money they tend to stop at the airport to launch it successfully. In the success cases there are users as inventors, and users always involved in the project. In the last example of the medical doctor, he was a user and he was involved in the project, and he was so passionate about getting what he wanted to use. In a failure cases on the other hand, there were nobody in the project who wanted to use the end product, who were passionate to launch the product, they were only after quick money or a wild dream, so they had lack sense of mission and they tended to give up so easy. In a successful project, typically medical projects, there are stake holders in the project who never give up having the end product, and that tend to result in a success.

Ms. Monica: In your experience, which is the best way to share the research results with the society?

Ms. Abe: What approach them to the project does not matter, it could be money, it does not have to be an idea or objectives, but I think that what makes us brace a project is whether we can successfully enhance and maintain the motivation level of the project members. To enhance the motivation level, I should make an information and put in the networking effort is also necessary. I have to keep inspiring them and they should have a high level of aspiration because I believe in all saying that if you don't give up you can succeed in the wrong land. What I think is important recently is not to start a conversation regarding how will terminate the project, I always let them think that there is always a next project, so they can get themselves involved, and during so, I don't let them think about how and when to terminate it.

Ms. Monica: Which factors encourage and increase the awareness of industrial property rights among researchers?

Ms. Abe: One of the encouraging factors is to have any type of success whatever small it could be to experience if the licensee's granted, the researchers will receive a lot of inquiries from businesses who are interested, that's important. Another encouraging factor is their colleagues, may be another professor in the next lab or in the seminar reside are enjoying success, all for applying for a patent, and they will grow interest. Another example is if one of the competitors in the same academic conference or the

academy is enjoying success, and if a success feature in a press release or the media, typical reaction is that the researchers give us a call at the patent office, it is a very good way to boost the interest.

Ms. Monica: I would like to ask you another question to Ms. Abe, you mentioned that there are about eight hundred researchers, which percentage of this researchers are from science and engineering areas that could have possibility to make inventions?

Ms. Abe: About six hundred of all eight hundred have possibility of developing some level of inventions. The number is large because we have medical school in the University. And, there is a University Hospital and all the medical doctors working for that University Hospital have obligation to perform some sort of research. Although, almost all what they do is the clinical activities.

Ms. Monica: How Many people are working in the IP Office and how do you have communication with the researchers, I mean, how do they know that IP Office exist and how do you manage this, because it's a lot of people.

Ms. Abe: In reality, the only thing we can do is just to wait for researchers to contact us, we do not initiate actions. There are five members of us, who can talk directly with researchers who can understand what inventions are, that's why there are five IP offices. And aside from them there are a Researcher Administrators, who support researchers in their research activities. They sometimes contact us for possible interesting activities but basically we can only wait to anything interesting happens. There are about 20 Research Administrators.

There are five IP Offices and aside from them the Researchers administrators and from them only two can understand of IP and the other people talk as they have got some understanding of IP, but actually they don't. So they could make wrong decisions, so I ask them to bring any interesting deals and do not make decisions on their own.

Ph.D Suwa: Ms. Abe, you said that only 20% of the researchers inventions apply to a patent and you said that you don't need to increase that percentage, but I think that in the United States the percentage is higher.

Ms. Abe: Actually it is not higher in the United States and we don't feel that we need to increase that percentage. Primarily because the budget it is limited and there are as many possible deals as the number of academic publications, but our budget is not that big. And in order to commercialize that inventions, first the researcher wants to do so, secondly because we are a University that a percentage of basic research is high and without the researcher's intention to commercialize the invention it is impossible to commercialize it.

Ph.D Suwa: Ms. Abe, you said that it is most important to not let them talk about how and when to terminate the project in order to bring the project to success, but what kind of information do you input, and what type of meetings do you organize or what are the mechanisms to keep the motivation level of participating individuals.

Ms. Abe: I arrange meetings, in the meetings I try to show and visualize the potential of the project and sometimes what is needing is a present it in the market and sometimes I suggest that is needing a little modification, then the commercialization probability will get higher. And when I identify an individual researcher whose motivation level declines, I will make a little communication to boost the motivation level. And sometimes I will ask other researcher members to convey and motivate with message some researchers, because they are involved in a project that it is going so well.

Appendix 3

Interview with Mr. Katsuhiko Shionoya
Specially Appointed Professor
Tohuko University

Date October 12, 2018
Place APIC
Time 10:30-12:20
Participants Mr. Katsuhiko Shionoya, Ph.D Yori Suwa[8], Ms. Tomoko Uno[9], Ms. Monica I. Garcia

Introduction

Ph.D Suwa talked about the program of research, and I briefly introduced myself and my theme of study to Professor Shionoya.

After Professor Shionoya provided the following relevant data and information about Tohoku University:

He mentioned that from this April they have a new President, Professor Hideo Ohno. Tohoku University has more than 100 years of history, through the years Tohoku University has been very close to the industries. The Mission of Tohoku University is to adhere to the "Research First" principle, "Open Door" policy and "Practice-Oriented Research and Education".

In Japan, the University of Tokyo is the most famous University, it is very big; after, it is Kyoto University, and then, the third or fourth is Tohoku University. Tohoku University is ranked in third or fourth top Universities in the national universities, but considering the number of patent applications maybe is the second University, after Tokyo University.

In 2017, Tohoku University had 400 notification of Invention, but not all of them are filed application, we file around 300 hundred domestic patent application. Tohoku University is strong in the electronics ICT hardware area, in materials and electrical communications. Recently we have bio-life sciences technology, but the biotechnology, Tokyo University, Kyoto University and Osaka University are stronger. Recently Tohoku University put weight on this field as well. However, the IP income in Tohoku University is large in development of drugs or life sciences devices.

The Organization of Head Office of Enterprise Partnerships we have a Ministry of Industry and one Vice Director of the Planning Office, I belong to the Intellectual Division which have very few personnel, including me, we have 5 members in the technological division and 2 administrators.

Tohoku University focus on Industry-University Collaboration, we have events and also we have a book for companies with the research profiles of the professors and assistant professors, before in the book it was printed the patent number but it was confusing so we remove it. So we include the professor's main theme of research. The University has many buildings and Centers, and have four campuses in Sendai, which are very close to each other, in the subway it will take you 4 or 5 stops going from one to another. We have seven Centers for Industry-University collaboration, I am in the New Industry Creation Hatchery Center (NICHe).

[8] Senior Researcher, APIC, JIPII
[9] APIC, JIPII

Around the University there are several companies and organizations to support collaboration or startup ventures. For example, the Earth on EDGE Consortium, is education for students to grow up startups; the Business Incubation Program (BIP) it is a fund for researchers to build up startups; there is another one originated from a National Policy and founded in 2015, the Tohoku University Venture Partners Co, Ltd. which is a support for venture companies. Tokyo University, Kyoto University, Osaka University and Tohoku University have each one this kind of companies by the Japanese National Policy. Also we have the Tohoku University Startup Garge (TUSG) for create startups.

The Amamiya Campus, is very near from Sendai, about 15 minutes by car and 10 minutes by subway from Sendai Station. Most central for ventures are building in the New Aobayama Campus (81 ha), this new campus has a Science Park Zone, Tohoku University has intended to invite many companies and research centers to this zone. The life sciences are in Seiryo Campus, it has a Hospital, there it is the Tohoku Medical Megabank Organization, the Graduate School of Dentistry and there is a Center of Life Sciences.

After Professor Shionoya kindly explained about Tohoku University, we proceeded to start with the questionnaire.

Questionnaire

1.- How do Japanese universities motivate, encourage and support their researchers to protect their inventions?

1.1.- Which programs and activities have been implemented by the Government and the University to disseminate the awareness of IP among researchers?

In 2004, MEXT funded for five years several universities in order to build up the Industry-University Collaboration.

In the second year (2005), I had come from a private Company TDK, a cassette tape company, and some other people from companies came to help the universities. I was IP manager of TDK company and I was invited from Tohoku University in that year.

Other people from Sony and many famous companies and also from several people from JPO came to the Universities. Professors, inventors and administrating personal are not so good at IP system. So outside of the Universities many people, especially from many national companies, came to the University.

Before 2004, the Universities couldn't file patent because they were not corporation, after that year they were incorporated.

In 2004, The Universities change their systems, in the first five years the Universities made their IP Policy including patent filing. In the next five years the IP office income grew up.

Another program from 10 or 15 years ago, specialist persons from the IP coordination government were sent to University.

JST mainly supported Universities with funding for filling applications in foreign countries. It cost much money to translate and to file in other countries, and the University has not so much money for filing domestic and foreign application, so JST supported this purposes. Recently JST supported us.

1.2.- It is common in Mexico for researchers to carry out several activities at the same time (research, teaching, and management activities), at the University, are there incentives to

reduce the activities of researchers who develop science and technology and let them focus on research?

Professors are busy in teaching and researchers are very busy, but we have two incentives. If the University gets money from a company by licensing or from IP, the University divides the amount. If the University get 100 yen, 30% of the amount is for the private pocket of the inventors, 30% is for research fund for the inventor's laboratory, and 40% is for the University's budget. So, Professors can use the money for future theme of research.

Recently University evaluates teachers, this evaluation includes the Industry-University collaboration. The collaboration for professors is not easy, some professors say that they don't like to get money so they leave free their research, but we have those incentives.

1.3.- In Japan, how valued and recognized is the effort of the researchers for protecting and commercializing the results of their investigations?

Researchers get public respect, academic respect and company respect.

1.4.- Currently, could it be considered that IP awareness among the university's researchers still being a problem?

There are many professors in Tohoku University, between 15-25% of the professors are interested in collaborations with companies, the others professors in academia are not interested in IP. But I think it is ok, it is not necessary all the professors to be interested. In think that 30% or 40% could be good but more than 10% of the professors interested in collaboration it is ok.

The rest of the professors are thinking in teaching not in collaboration, but it is ok because the University's aim purpose is not to get money.

Some professors are actively in academic's activities, and it is the best. The University does not do collaboration with the companies.

Ms. Monica: May I ask you a question, you said that one of the incentives for professors is to evaluate them, do you take into consideration the patent applications?

Each faculty has different standard of evaluation, recently many faculties are thinking on patent applications and patent income. In some areas is not important the patent application, and it is not considered in evaluation, but in engineering it is important, patent number it is evaluated. Recently the number of patent application came to be considered as one factor for evaluation of the professors.

2.- What are the most important factors which the professors and researchers should know for protecting and commercializing the research output?

2.1.- How is the procedure to determine if the University will submit an application to the patent office?

If a professor or researcher make an invention and he wants to file in IP, he will file online in the IP division. Then we will evaluate three requirements:

1.- Patentability

2.- Company and Industry Activity

3.- Strategy

There is a TLO named Tohoku Techno Arch that it is next door to Tohoku's IP Office; Tohoku Techno Arch is a private company but it is very close to the University. And we let them estimate and evaluate the report of the invention.

Every week in Monday morning, 10 members from IP Division and Tohoku Technology TLO, evaluate each invention to decide if we file or not, they decide.

Monthly, another Committee (Members from each faculty professor) make decision and approve based on the choices made by weekly meeting. If the Committee decide to file, an IP office outside the University file the application. We have several patent attorneys but we usually ask the patent attorney outside the University to file the application to JPO.

I must say that we have 300 IP filings, but 200 are from collaboration, so they are joint applications with companies. So we are dealing with 100 filings because in joint application the company deal with it.

If there is a patent Tohoku Tech Arch mainly deal with the companies, so IP division of Tohoku University search for new inventions. IP Division and Tohoku Tech Arch will search for new inventions with the professors and sometimes there is a complex relation with the TLO because we are made up from 2004 but they have more than 20 years of history.

2.2.- If the University decides not to make the patent application, grants the researcher permission to use such research?

If the University does not file the invention, then return it back to the researchers. They can file it by themselves or by another company.

2.3.- How does the University assess the importance of Patents, utility models, and industrial designs? Does the University hire external IP firms for this purpose?

We don't have utility models. In 15 years we have not utility models and just 2 or 3 industrial designs per year. Trademarks are growing up in numbers.

Our University don't use IP firms for evaluating the importance of the patent. We evaluate inside the University.

Ph. D. Suwa: Does Tohoku Tech Arch work only for Tohoku University?

Prof. Shionoya: Tokyo University is a TLO of Tohoku area, they are dealing with other cases, but more than 95% is dealing with Tokyo University IP. They are settled inside Tohoku University Campus, next door to IP Office.

Tokyo University has 100% stock of TODAI TLO, Kyoto University has more than 70% of KANSAI TLO and Tohoku University has no stock of Tohoku Tech Arch. Recently we wanted to get stock, may be this year or next year we will get stock of Tohoku Tech Arch, we tried before but they rejected the idea.

2.4.- How important is that the researchers include the patent information in their research?

Some professors are from big companies, for example, Professor Endo from Toshiba Company, he thinks that it is important the patent information for research. But students and professors in the University think it is not so important this information. For some teaching professors the IP information is very

important for research, seminars, and we have manual for professors which says that IP is very important for research.

For technological trends is very important to get IP information, the searching is very important, so teaching how to use for example J-Plat Pat is very important.

2.5.- Do you consider that the researchers should protect their science and technology before publishing?

It is very important. There is a grace of period of 12 months in Japan, but many companies do not use the section 30 in the Japanese Patent Law. But Tohoku University uses this section 30 in Japanese patent law more than 20 or 30 cases of filing per year, it is not so good.

The Professors don't think it is so important for their research, so they publish in seminars or academic conferences but for Companies is very important, they must file in the patent first.

After the conferences the professors will come to us wanting to file the applications, but sometimes is too late, we can get the patent in Japan or the United States but not in China or Europe. So we say please file in before conferences or publishing.

Recently many teachers have their own website and they publish, so this has become a problem.

The JPO extend the period from 6 to 12 months and that is helpful for us, however, there are some professors who think that the original report does not kill their patent.

2.6.- How does the university attract funds to bring technology to the market? Is this process bureaucratic?

JST NEDO request the Professor to write patent number or patent title, NEDO is for searching professor's activity in the patent IP filing.

There is one problem, some professors are willing to file because they can get funds, sometimes they only need the file number registration, but filing an IP applications help to get more money from companies.

We also say professors that if we file IP from research one and a half year after filing your patent will be published all around the world and many people will read the patent, so several companies will ask you joint research, it is what I say to the professors

Professor Shionoya: I can't understand the second question, is this process bureaucratic?

Ms. Monica: I can explain, for example in the case of University of Guadalajara, when we get fund from companies or the government, the money arrives in a central office, and could pass around two months for the professor in Campus to receive the money for research. And the fiscal year for use the money usually is from March to October, so from November to February sometimes the budget is not available. A situation like this happens in the Tohoku University?

Yes, we have the same problem with the fund money. In Japan, the fiscal year is from April to March, so the professor must use the money before march.

The money from IP, I mean when company pay money to the University, maybe is two months delayed before the professor can use the money, sometimes within three months.

The money cannot be used next year, so in January or February we say to the companies please don't pay money in this months, please wait until next April. The companies understand this situation; they realize all the system in the University.

3.- Which is the best practice in your experience as the university IP person in which IP rights provide more value for the research?

3.1.- Could you please mention a successful case where the industrial property rights increased the value of the science or technology research? How was the procedure for protecting and commercializing the invention?

Tohoku University has a brain training game named Kawashima (Noutre), it is well known in Europe and in the United States. Ten years ago Tohoku University got very big money from Nintendo. Professor Kawashima made games from Nintendo family computer, portable games. There is a big market in Japan, US and Europe, not really in Mexico. There is not IP there, it is knowhow, but we got a lot of money (10 billion) from games.

There are other cases, In the beginning of 2000, Professor Omi got much money from making a semiconductor device. Professor Esashi also made semiconductor and memory devices.

Tohoku University has many successful cases of collaboration with companies. Results of research are wonderful. The TLO Division working is important but not related with the success. Mainly the professors and researchers fit industrial requirements company.

The semiconductor market is very big, also telecommunication market. Professor Koike is studying about copper materials to be use electronically, in TV, semiconductors or solar panels instead of silver because the cost of copper is cheaper.

The public wants the technology is a very top research, is very successful technology.

Ph. D Suwa: Excuse me, when was the patent application of Professor Omi?

Professor Shionoya: From beginning of 2001, Professor Omi filed more than 100 patent applications before the incorporation of the University. Professor Esashi also filed many applications.

Professor Uchida also has a display devices research. Professor Ono makes semiconductor and memory technology devices.

Tohoku University has big IP stars. Professor Inoue studies metallic glass material, he has more than 60 patent in Japan and more than one hundred around the world. He gets much money. Tohoku University has several big starts of IP, but recently we have also young researchers, Professor Yoshikawa has more than 10 patent filings per year.

3.2.- What benefits did the researcher, the university and the society obtain with the commercialization of this invention?

If a company pays money to the University, 30% of the money is for the professor, 30% is for the professor's laboratories. But also the researcher will be famous and get will get respect from many people, but also from the government and companies.

Many Professors say that he they are happy if their result of research are in the market and if the device or material or service get into the market. Also if the result of research in the University is selling or is used in a social area, they are very happy. Several professors have talked to me.

3.3.- Could you please mention a non-successful case for protecting and commercializing an invention? What are the main lessons from this case?

We have many non-successful and failure cases.

There are researches which were not required for the society or not used although the professor was thinking that was very good, very useful and the people would buy his device or material. But they said the society didn't think the same, so it was not matching.

Or Professor was thinking it was a very new invention, but 10 years before it was researched by a Company, that's because the professor did not make a search of IP in a database before starting the research, so it was a very old technology and he couldn't get IP or respect from the companies.

3.4.- In your experience, which is the best way to share the research results with the society?

For me, the professors of Tohoku University are free to share. But our job is getting money from the companies, so first of all, limited companies need licenses but the market is growing, so the University must have not only one but several companies for licensing. Limiting stop to expand market and new inventions, but is very difficult to understand that.

The games had only Nintendo; communications and semiconductor materials have many diverse companies (material companies, application companies, etc.).

The University sometimes make consortium, for example for materials 3D printer, there is one with TRAFAM and professor Chiba is a member, a leader of TRAFAM, related with 3D metallic printer. In a consortium, a group of 15-20 companies join the group; by joining the group they are not so exclusive, so the University joining this group is very good I think.

The IP licensing is very difficult and University spends much money trying to license this IP and sometimes the companies don't take this IP. So decide how much money will be for licensing is very difficult. The medicine licenses are high risk, material licenses are not so high risk, semi-conductor and tele-communication licenses are very low price because IP is small, but IP from medicine is big, so it is different, technological vision is different.

Different strategy is needed in each technology area, the IP strategy is different for medicine or materials or 3D communication or robots, so I need many IP specialists, but we have only five persons. We have only one bio scientist, he is a patent attorney, his major is in life sciences, he is the only one in bioscience.

And one person moved to JPO in this April; in Tohoku University there are many people from JPO, but some members moved back JPO; 3 examiners came to Tohoku University and went back to JPO two years ago. There were temporary examiners for 5 years for Tohoku University. Also this year, 2 persons from IP Division moved to JPO as examiners.

3.5.- Which factors encourage and increase the awareness of industrial property rights among researchers?

- We can share successful cases with professors; it is important to show to professors this cases. It is also important to share the results of research.
- It is important that the researcher's laboratories receive money from licensing.
- It is also important to make contribution to the society.
  Lead to big innovation, the researchers are very happy to reach innovation.

Appendix 4

Interview with Professor Kimiyoshi Watanabe
Patent Attorney
Junior Associate Professor
Institute of Research Division for Research Innovation
Research Center for Industry Alliances
Tokyo Medical and Dental University (TMDU)

Date October 15, 2018
Place Tokyo Medical and Dental University (TMDU)
Time 15:00-17:20
Participants Mr. Kimiyoshi Watanabe, Ph.D Yorimasa Suwa[10], Ms. Tomoko Uno[11], Ms. Monica I. Garcia

Introduction

Professor Kimiyoshi Watanabe kindly receive us, the meeting started with Ph.D Suwa introducing the Program, after, I briefly introduced myself and my theme of study. Then, Professor Watanabe provided an overview of his organization and TMDU.

Professor Watanabe: I would like to give you a briefly overview of my organization and the TMDU, the name of my organization is Institute of research; in this organization we will provide a universal research support. And you will find that there is a number of centers and I belong to Research Center for Industry Alliances. Our coverage in the Center is application for the patent and IP until we obtain the right. We also handle the agreement when we collaborate with the private sector. And then, we explain the flow for the patent application until we obtain the right.

I think your University has a similar flow, first when the inventor discovers the innovation, he or she has to submit a notification of invention. I will give you the details later but I think that the number of notifications is small, so one of our activities is to expand this number.

And then, once the notification is launched, our Center will run an evaluation for its feasibility whether could become a patent or not. However, we do not make a conclusion in this step, we will reach a conclusion in step number two, in which we will decide whether or not would become a patent, and the decision making panel is constituted of our Committee members and it include one external member. And when our decision is made to file for an application, the inventor should grant the University the right to receive the patent. So the basic idea is while the right to file for the patent is in the hand of the inventor or researcher, when the University apply for the patent, he or she has to give it to the University. However, if the University decides not to apply, the researcher still own the right for the patent, and the right to apply for the patent.

Once the decision is made we will go into the process to apply for the patent, in this flow the University is the applicant, and the researcher remains as the inventor.

[10] Senior Researcher, APIC, JIPII
[11] APIC, JIPII

The cost of the application primarily is covered by the University, but there are exceptions, a typical exception is when the application is made jointly, most of the time made jointly by the private businesses, because once we apply with private businesses our principle is that the business should cover the cost of the application. However, the recent trend is that the business does not want to cover the cost, this issue has becoming more and more serious for us. So this is the overview of our process, do you have any questions?

Ms. Monica: so in the university policy it is established that the professor owns the patent but he has to give the right to the university or is just optional?

Professor Watanabe: It is a principle and there are no exceptions and it is one of the rules of the University.

If there is no other question I would like to take your questions on this list one by one.
Questionnaire

1.- How do Japanese universities motivate, encourage and support their researchers to protect their inventions?

1.1.- Which programs and activities have been implemented by the Government and the University to disseminate the awareness of IP among researchers?

We offer seminars. When it comes the invention notification there has always been a clear tendency, those who are eager to notify the invention, they do. But those who are not interested in applying, they don't notify us at all.

So we will target the researchers who has never notified us the invention and give them a seminar where we explain why an invention means and how they can benefit from the inventions.

And by giving seminars we encourage those who have never notify us to notify, and we also encourage those who has already notified us to enhance the quality of notifications.

We also have an incentive scheme for the inventors, let me explain how to calculate the incentives, when there is a licensee fee paid to us, first we have to deduct the cost associated with the application. Then, what we make is split 40% to the inventors and 20% to the department or office where the researcher belongs to and the remaining 40% is for the University. Also we pay 30,000 yen per application to the researchers.

This is the direct monetary incentive paid to the inventors, but this involved some budgetary issues, so we made a modification to the scheme, actually before 2011 the percentage paid to the inventors was 50%, which means that the University can get more and it is used for the cost associated with applying for a patent of new inventions. This is the defined in the University policy and this has never become an issue.

Ms. Monica: May I ask a question; the 30,000 yen is the group of inventors?

Professor Watanabe: Yes, it is per group, and when there is more than one inventor, we ask them to give us how much contribution each of them has made, sometimes it is split 50, 50%, sometimes one receive 20,000 yen and the other 10,000 yen. In order to avoid troubles, the self-declaration contribution should be made when the inventors give the right to get a patent to University.

1.2.- It is common in Mexico for researchers to carry out several activities at the same time (research, teaching, and management activities), at the University, are there incentives to reduce the activities of researchers who develop science and technology and let them focus on research?

The situation in TMDU is the same as the situation in Mexico. Regarding the last part of this question, what are the activities that you do in your University in Mexico?

Ms. Monica: In the case of the University of Guadalajara actually there is no special consideration for researchers, they have to teach, sometimes they have to make manage activities and at the same time they make research, but there are not incentives for them to focus just on research.

Professor Watanabe: It is the same here, we don't have any scheme to incentive researchers to do research, it is up to them totally. If the researchers want to prioritize teaching activities over research activities, we will let them to do it. However, the patent related activity is what they have to know about, so we offer seminars, but we don't say that invention activities should be prioritize over teaching activities.

1.3.- In Japan, how valued and recognized is the effort of the researchers for protecting and commercializing the results of their investigations?

Regarding this question, you are asking me in Japan but I would like to answer in our University. First we got the incentive scheme; other effort includes our performance evaluation system when the number of application made is counting on the performance metrics. However, you specifically ask about the commercialization of the results or the inventions, we actually do not see the commercialization with particular importance, of course is good that we can get some revenues, however what we count at the performance is how much of the research results has led to inventions.

I said earlier that when we make a decision whether or not to apply we see the feasibility of licensing, however, this is not the only criteria.

1.4.- Currently, could it be considered that IP awareness among the university's researchers still being a problem?

The answer is yes; it is an issue. We have some issues, there are so many researchers who does not have any awareness of the importance of patent applications or patent rights. That's why we provide seminars as I repeatedly mentioned, but the purpose of having such seminars is that we want the researchers to know about the importance of making a patent application, but one of the objectives for us is to know more about the researches.

Of course, it is a problem that the researchers have only low awareness on the importance, however, we do not think it is major challenge for us, so we can leave the low awareness as low, and if there is anything that may need our attention we trap these opportunities at the seminars. Because we respect the philosophies and thoughts held by each researcher.

Ms. Monica: How often do you offer these seminars to the researchers?

Professor Watanabe: Four times per month, but let me tell you a recent example, we have a list of the laboratories and offices, there are so many, but our calendar year is to visit all and every one of them. Let's say that there are about 200 laboratories and if the pace is four times per month, then with simple mathematics will give you that it will take more than 50 months to visit all of them, this initiative has just started.

2.- What are the most important factors which the professors and researchers should know for protecting and commercializing the research output?

Regarding this question, we have got an internal discussion and I am still not sure about how to answer this question because in the University we don't see much importance in commercialization. What is more important for us is to make a contribution to society, then the commercialization is not always necessary as long as the technology is widely penetrating in the society, we are fine.

2.1.- How is the procedure to determine if the University will submit an application to the patent office?

There are 8 evaluation panel members right now, they have a serving time of one year and each have different area of expertise. For ensure the impartiality, our policy is to include one external member, which means that one of the members does not belong to TMDU, our University. The decision making criteria we have, first is the feasibility and secondly the probability of licensing, also if the researcher achievement is great or not. I said that one of the criteria is the probability of becoming licensed, however is hard to see, so our recent policy is to involve private sector at an early stage.

In collaboration with private sector once the application is made, the business will take care of the invention and they would use it, so we do not have to worry about whether it would be licensed or not.

2.2.- If the University decides not to make the patent application, grants the researcher permission to use such research?

If the University decides not to apply, the researcher still own the right for the patent, and the right to apply for the patent. Is up to the researcher how to do it. Once the decision is made that we will not apply, the invention leaves a hence of our center, so if the inventor wants to apply for a patent, he or she has to take care of it by his or her own.

But I have never heard of any researcher who has gone to that path, so when the decision is that we will not apply, I guess that one hundred percent of that inventions will be published in the form of academic papers, so the technology will be used in society.

2.3.- How does the University assess the importance of Patents, utility models, and industrial designs? Does the University hire external IP firms for this purpose?

In this question, you ask particularly about the importance of patent, we understand its importance but we don't think is the paramount importance, we asses them but the result of our assessment is just a result and that's it. We run an assessment for our performance evaluation criteria, that includes the number of applications made to the researcher's invention.

Regarding your question whether or not we hire an external firm we got a contract with technical transfer specialist firm, this firm promote the inventions for future licensing to private players. Also, we consider members who has a private sector licensing experience when we have to hire a new person at the Center for Industrial Alliances.

As a way of increasing the University revenues the answer is yes, we hire technological transfer specialist from external firm and inside us we make the route to hire someone who has private experience.

2.4.- How important is that the researchers include the patent information in their research?

As I said earlier, the number of applications is one of the performance evaluation metrics, another recent trend that I was mentioning is that they try to get research grant, it is likely that they can get fuds when they have a patent application already launched.

Also when the researchers communicate us the research activity, they have to declare the importance of the research activities. But it is still possible that although the researcher himself thinks it is an important invention, the assessment result by this panel is not.

Once the assessment panel decision it is that is not important, then, automatically, researchers can apply for a patent when his or her laboratory is willing to cover the cost associated with the application. When the researcher consider that the invention is important and therefore they want to apply, we will respect the intention as long as the application cost is covered by his or her laboratories, we don't discourage them to apply.

2.5.- Do you consider that the researchers should protect their science and technology before publishing?

Let me talk about how is going at University, it is not my own idea. The University's idea is that should be protected before publishing, however, our policy is to respect each researcher's decision. It is on the researcher's decision at what time the invention should be published before or after the application. But we would tell them that at least in Europe once the invention is published you cannot get the patent. We would allow them and not stop them for publishing if the researcher's intention is still publishing the invention, we would let them to.

So, we never tell researchers wait until the application is made. But recently, in most cases, researchers wait for publishing until the application is made.

2.6.- How does the university attract funds to bring technology to the market? Is this process bureaucratic?

As an example to get funds, we try to increase the number of collaborative research, so that, we can get more grants. We have collaborative projects with the private sector, and others, such as public interest policy. As a result, the research fund is increasing rapidly, in 2015, it was very close to 300 million yen.

Another way of getting funds is a scheme for individual or a small group of researchers, they can offer technical advisory or consultation to other organizations. In terms of the consultation or advisory service they can get a fee, which they split to the University as well. This is another way to get funds for the University.

This is what we call the join research lab, this is different from collaborative research project. In joint research scheme, we would receive outside researchers as our researchers, but in order to be reachable the project should be at least two years long with a maximum of five years. While if it is a collaborative research the minimum length is six months.

In another way of having such a project is what we call comprehensive alliance, in this comprehensive alliance scheme you don't have to define a specific research topic in the beginning, you can just explore the possibility. So, you can start just by exploring research possibilities under this comprehensive alliances scheme, and once you can successfully define the research topic you can move to, for example, a collaborative research project. This is a way to work with the private sector, and we formulated the scheme so we can satisfy the needs of the private sector in the long term we hope more evidence will come to us.

3.- Which is the best practice in your experience as the university IP person in which IP rights provide more value for the research?

Professor Watanabe: Do you expect me to talk about my personal experience?

Ms. Monica: Yes, please.

Professor Watanabe: Since I am a patent attorney I am eligible about patent scheme, based on my experience of handling IP from companies, I think I can give some support in aligning with private sector. I can give advice to the researchers regarding what are the requirements if they want to work with the private sector. I believe that when the researchers have well understanding of the companies needs they can match their research with private company requirements, and they can also enhance the value of the intellectual property.

There is one of my colleagues who has full understanding of patent application, the person is also form businesses, so by attracting more members with corporate experiences, I believe that I can offer services based on the awareness of the needs not only in the University but also outside of the University.

3.1.- Could you please mention a successful case where the industrial property rights increased the value of the science or technology research? How was the procedure for protecting and commercializing the invention?

Please understand that I cannot give you details of a specific case because we have got in a confidentiality agreement with our private partners and whether or not it has result in success, for details I need to ask for approval.

In terms of the number of licenses, in 2015 rapidly increased from five to twelve, so I can say that the revenues associated with that is also increasing. This could be one of the successful cases because the licensing fee is increasing.

The number of patent registered in this year, 2015 was 143 for Japan and 92 outside of Japan, however only 12 licenses were made, from that, I can say that it is hard to get a license, so we want to increase them. However, sometimes I think this could be the maximum we can reach.

Although I am eager to increase the success cases, at the same time I have to say it is not always easy.

In 2015 the number of licenses is high, but we cannot easily say for this particular year that the revenue is high as well because the amount of revenue that each license creates barriers, sometimes it is small, sometimes it is big. Sometimes it is small but it keeps creating revenues for long time, so it is hard to define clearly what constitute a success so the number of licensing and the size of revenues varies every year and it goes not in synchrony with each other, sometimes the number of licenses is high and sometimes is the other way round.

Ms. Monica: Are there any other successful cases?

Professor Watanabe: If you want to define success cases by something other than the revenues if you ask me specifically I could be able to answer your question.

Ph.D Suwa: For example one of the interviewed from other University talked about how they successfully combine a particular invention at a medical school with the invention of their own researchers and how it has been commercialized. So It does not have a specific commercialization made by specific researchers,

but I understand you belong to medical University, so it takes time to make it, and most of the inventions still on development.

Professor Watanabe: We have a list of startups which were born as a result of TDMU effort, we have a certification scheme and when they have the certification we can give them a title of TMDU start up.

3.2.- What benefits did the researcher, the university and the society obtain?

From the researcher's point of view, the benefit of the scheme is that the invention is used in society, from the TDMU point of view the benefit is that the invention is used in society and to private enterprise, startups.

Unfortunately, not of them have generated a lot of revenues at the moment, however, I believe that in the future is quite promising.

For example, the first one, MedTech Heart is the name of the company, this company develops hearts.

The second one Health Life Sciences, offers services to asses each individual person immunology systems power.

The third one is a company that develops surgical robots and other medical devices. It develops medicines that will be used in the future.

It would be great if we can expand this list, however, the number is too small and I don't think that it would be expanded rapidly. But if these technologies become reality from this startups, it would demonstrate that TMDU is making good in society and it would work as advertisement of University.

3.3.- Could you please mention a non-successful case for protecting and commercializing an invention? What are the main lessons from this case?

Regarding this question, I have explained the successful cases, which means the other cases have been a failure, and our objective is bring them to success.

As a way of increasing successful cases, one of our efforts is to increase the number of collaborative research because we found that making a licensing effort in the beginning or early phase we believe that it is more likely to bring the project into success.

Our current effort as TMDU is not involved us when the research achievement is discovered, we have to get involved before that. I believe this may be the way to increase the number of successful cases.

3.4.- In your experience, which is the best way to share the research results with the society?

Since I am working in the Bureau of Patent, I would like to answer that the best way is to get a patent and to apply for a patent. However, having a patent means that you can monopolize the technology so if you ask if is the best way for society, half of me is quite suspicious and part of me thinks that the best way to contribute to society is let the technology used the technology by anyone who wants to use it, not by monopolizing it.

Applying for a patent is important in the field of medicine for example because without monopolizing the technology, no private sector may be interested in developing medicine, so applying for a patent is quite meaningful and this is the best way to serve the society.

In other field, the right to monopolize the technology is less important, I believe that other ways for example publishing in Academic papers may be a better way to serve the society.

But this is from my point of view as a member of TMDU which is a government owner University. If I were talking from a private company, then my answer could be different.

3.5.- Which factors encourage and increase the awareness of industrial property rights among researchers?

One way is to award the startups who find a good use for the technology in society, such a TMDU startup, we can make a researchers see how the invention is been utilized in society and I think this is one of the ways to motivate, to be more aware of the industrial property rights.

I feel that there is a gap between the awareness held by researchers and the awareness held by private companies, researchers tend to see that it is a basic research that it is effective for example, but the private sector tend to see that the technology whether or not has market value.

When I communicate the corporate thinking to the researchers, I believe that the researchers would enhance the awareness.

So we make an effort to encourage the startups with a title award, and the other effort is to let the researcher know the gap between the awareness held by the researchers and the awareness held by the private players.

Then I believe they would enhance the awareness of the importance of IP because they can see things not from the narrow perspectives but from wider perspectives including the perspectives held by corporate players.

I think I have answered all the questions but I am happy to take any other question if you have.

Ms. Monica: I find very interesting the high percentage of the patent applications considering the notifications from inventors that you have, and I think this is in part because of the seminar that you give, so considering the goal that you have of being closer to all of the labs that you have, I think it is very important the communication with the professors and the inventors. So I am very interested to know, how many researchers do you have and how many people work in your IP Office, because this is challenging, to get closer to more than 200 labs, it is very important but very challenging.

There are three of us who can cover from the application to the patent right granted, and aside of them we have two members whose primary job is licensing and the introduction of the technologies to the companies. These three members of us with the two members are team ark and cover the labs, so when we have seminars not all the five visit the lab but at least there are two of us.

As I said earlier is a tough job for us to cover all over 200 hundred labs, so we are discussing how to get it done. One of the majors is to learn about what it is done by a particular lab, so we can prioritize labs. The prioritization is primarily done by other members of us who has a licensing experience from private sector and they know what kind of technologies are currently attracting attention and if there is any technology closer to the one attracting attention, we would prioritize the labs having such technologies.

Ph.D. Suwa: Aside from Monica, I have taken care of other fellows and I have experienced the interviews in other Universities, so I have notice that there are some differences between TMDU and other Universities. For example, other Universities typically said only twenty percent of the professors are interested in applying for a patent but they are satisfied by that because they don't have the application cost to rights, what is your situation in TMDU?

Professor Watanabe: Well, it is depending on how to define researchers if we have to include medical practitioner and clinical medical doctors, the percentage would become very low, however if we don't include the practicing medical doctors, it is higher than twenty percent.

Ph.D. Suwa: You talked about IP value assessment and in my understanding other Universities have similar panel, but this is the first time for me to hear that one external member it is included, what is the profile of that external member, is he or her medical doctor in other University?

Prof. Watanabe: At the moment yes, one external member is a MD, however since the service term is one year, every year we get different members. Last year for example, one external member was an employee from a licensing specialist company and two years ago the external member was a member of pharmaceutical industry board.

I said there are 8 members, but the number of 8 is not fixated, it could vary, so when there are more requests realized for us, the number would be more than 8, and if we less request, it would be less than 8.

The reason why we involve external members is that TMDU is a specialist University, so we understand what is happening at the pharmaceutical industry, but actually the players who want to collaborate with us are not limited to players in pharmaceutical industry, it could be an IT Company or a new entrance to the medical industry, that's why we thought we needed a person with a broader experience in this field of expertise.

Ph.D. Suwa: I have a question about your seminar, when I had a similar interview in other Universities, quite often I hear that professors are not interested in registering IP, so they offer such seminars to students not to the professors, it is the case at TMDU?

Professor Watanabe: We involve the professors, actually at TMDU we cannot apply our internal rules to University students, so if a student innovation it is used in society, that would not become our property according to our rules, that's why we think that it is more important to change the awareness on the side of the professor rather than the students.

We say that we offer seminars to the labs, but we started this year, before then we offered seminars but it was provided only in response to the request made by the professors, but starting this year we proactively give them the seminars.

Ms. Monica: I have one more question, you said that the maintenance cost has been an issue, and you said that after the licensing of the patents is not possible you give up paying the fees of the right, so I would like to know how much time you wait for licensing the patent before you give up paying the fees of maintenance?

Professor Watanabe: It is actually a tough question to answer, I cannot give you a clear answer because for long time it hasn't been any licensing movement for a particular patent, although sudden all of the businesses become interested in commercializing it, so it could be for example, researchers talking about the technology innovation at a certain place but whatever, but we cannot deny the possibility for being licensed, so it is actually a very tough question, and it is not a clear way of saying that this is what we can wait.

And we use the IP value assessment that I mentioned already, and in the panel we discuss whether or not we should retain the right or give it up, and it is an individual decision and we would consider if is worth the cost to retain.

But as a general milestone, we would wait for seven years after the application. But is it just a milestone that we define in a previous meeting and does not have any rationality behind it.

Statistically speaking, 60% of the patent is licensed within two years of application. And as I said earlier we try to get ourselves involved in an earlier stage, when working with the private sector, so increasing the percentage of the innovations are used in the society within only one or two years from the application.

As I said earlier, the panel that make individual decision, and when we make this decision the cost is a consideration point, so in some cases, our decision is to retain when the cost is low, and the decision could be give up when the cost is high, so it really depends on the situation.

Ph.D. Suwa: So, you talked about consultation, join research project and comprehensive alliance project, the stages of programs like this, I find them a good idea, when did you start having such a stage programs?

Prof. Watanabe: Joint research was launched in the fiscal year of 2014, the comprehensive alliance program was before then, however, for a long time this is public information, so I can tell, Sony has been the only company using that scheme. We want to increase the number of the players in this program, so we have an extra focus on this program, only recently.

The consultation program is the most recent one, it was launched in 2015-2016. Individual researchers were able to give consultation and advisory activities, they did so, however, outside of the control of the University, so this system was launched because we want to get it done in a structure way.

The biggest change is that 10% of the fees, should be pay to the University.

Ph.D. Suwa: You said that in IP value assessment panel, one of the external member used to be a member for the technological transfer specialist company, this is again the first time I hear about that and was the company recently hired? Can I ask how costly is the structure?

Professor Watanabe: We actually have relationship with them, since about ten years ago, we asked them for their active involvement since 5 years ago. So about ten years ago, they only offer a consultation service to us, but since five years ago their involvement became more proactive, for example, they are seeing individual researchers directly. So as I said earlier we try to get ourselves involved earlier in the flow, and when we do so, quite often the specialist company member is also involved, of course there is a cost for the service.

The name of the company is Tech Manage, and if you visit the corporate website they collaborate also with other Universities.

Ph.D. Suwa: The name of the startup is the name of the professor?

Prof. Watanabe: Sometimes the startups belong to the professor and for this three companies the professor, inventor, launched the company, however the remaining companies not.

The title awarded is that is TMDU initiative startup, and they can freely use the title.

Appendix 5

Interview with Mr. Ryo Washizaki and Mr. Satoshi Kurokawa
National Institute of Advanced Industrial Science and Technology (AIST）

Mr. Ryo Washizaki
Manager
Intellectual Property and Standardization Planning Office
Intellectual Property and Standardization Promotion Division

Mr. Satoshi Kurokawa
Intellectual Property and Standardization Planning Office
Intellectual Property and Standardization Promotion Division
Research and Innovation Promotion Headquarters

Date November 7, 2018
Time 9:30-11:10
Participants Mr. Ryo Washizaki, Mr. Satoshi Kurokawa, Ph.D Yori Suwa[12], Ms. Tomoko Uno[13], Ms. Monica I. Garcia

Introduction

First, Ph.D. Suwa introduced the objective of the Fellowship Program, then, Ms. Monica provided information related with the University of Guadalajara, her job responsibilities, the program of strengthening the protection of inventions in the state of Jalisco, and her theme of study.

After, Mr. Washizaki kindly talked about National Institute of Advanced Industrial Science and Technology (AIST). He mentioned the following information:

First, it is important to understand that AIST is not a University, it is an administration body manage by METI and its aim objective is to connect the research activity which benefit Japan as a country.

Because of that background our mission is quite different from the mission of the Universities, while Universities aim to pursue freedom of research, our aim is to support prosperity of economy and industry. So please keep this in mind when you listen to our presentation.

Our President worked in Sony and now is the President of AIST, from this you can see that we think it is important to arrange the relation to the AIST and the company corporate management, although we conduct research activities.

The department and the center include environment, IT and chemical materials.

There are 2,300 researchers supported by around 700 administrator employees.

Questionnaire

[12] Senior Researcher, APIC, JIPII
[13] APIC, JIPII

1.- What are the main programs and strategies in Japan that motivate, encourage and support their researchers to protect their inventions?

1.1.- Which programs and activities have been implemented by the Government and the Institute for Science and Technology to disseminate the awareness of IP among researchers?

Mr. Ryo Washizaki: As a general overview, in Japan, about 20 years ago when the bubble economy irrupted, there was a momentum to promote the necessity for protecting the inventions.

Around the year 2000, there was an Organization in the government to develop a strategy to protect IP rights and there were several movements in that year that created the policy regarding IP.

After 2000, there was an encouragement to the government to direct the businesses and universities to launch a team to protect IP rights. When I say government are specifically mean MEXT and METI and especially for universities there was one time when the government provide that some subsidies to the University and such organizations.

Since 20 years ago they are awareness among researchers about protecting the inventions is now being recognized.

1.2.- Are there incentives for researchers to develop new science and technology, which have possibilities to be protected by industrial property rights?

Mr. Ryo Washizaki: AIST do not have an economic award incentive to protect inventions, but If an invention made by a researcher is transferred to their businesses, as a result, we receive some revenues, some percentage is for the researchers.

As I said earlier the researchers still prefer publishing the research rather than filing an application for patent, however, because of the history, the IP legacy is being raised but understand that the IP officers like me Should promote understanding about the importance of IP rights among them.

There is a strong tendency among the researchers that they should pursue a research grant over return from IP, so from my other vision is that What drives and motivate researchers is the idea that a good research is awarded, not by IP revenue but by grant.

Ms. Monica: Excuse me, it is possible to know which percentage it is granted to the group of researchers if you transfer the technology?

Mr. Ryo Washizaki: It depends of the total amount of the income but it's about 15% to 50%.

Ms. Mónica: In your office, do you do some Seminars or special activities to promote IP rights?

Mr. Ryo Washizaki: We offer visit training and we offer also specialist seminars target to insigne the researchers for the evaluation. I think without continuing such activities we cannot raise the awareness.

1.3.- In AIST, how value and recognized is for the researchers to protect and commercialize their research?

Mr. Ryo Washizaki: The awareness level still not perfect, some of the researchers feel happy when their invention is well utilized in society but there are sometimes other types of researchers who pursue pure research only, but since AIST is an administrating body, our idea should be that an invention is counted only when is utilized well in society, so I have to tell them repeatedly, I have to raise an awareness among researchers that the invention is counted only when the invention it is well utilized in society, so it is what I have to do.

1.4.- Currently, could it be considered that IP awareness among the researchers is not a problem?

Mr. Ryo Washizaki: There are still a lot that we have to do.

2.- What are the most important factors that researchers should know for protecting and commercializing the research output?

2.1.- How is the procedure to determine if the Research Center will submit an application to the patent office?

Mr. Ryo Washizaki: First, the researchers are requested to create an invention notification form and it should be submitted to his or her manager.

Basically, if the manager consider that it would be submitted as a patent, we would make an application, but sometimes the manager thinks that it should be kept as a secret the know how or sometimes things that it is too premature to make an application, then the application would be suspended.

Ms. Monica: So, in this case, do the managers have knowledge of IP?

Mr. Ryo Washizaki: Before we are submitting the notification of the invention, the researcher work with the patent officer who has research experience and IP knowledge.

The patent officer and the inventor or researcher develop a strategy, after, they will submit a notification to the manager, and the manager make the decision whether to apply or not for a patent.

2.2.- If the Research Center decides not to make the patent application, grants the researcher permission to use such research?

Mr. Ryo Washizaki: The answer is no, our philosophy is that all the inventions in AIST belong to us, if we decide not to apply, since the right belong to the organization, researcher cannot make an application.

2.3.- How does the Research Center assess the importance of Patents, utility models, and industrial designs? It is this process internal or the Research Center hire external IP firms for this purpose?

Mr. Ryo Washizaki: We make this process internally, as I said earlier, there are patent officers, IP experts like me, and technology transfer specialist; we work together and one or two years after the application we decide whether we apply for the patent outside of Japan or request the examination but the process is quite costly, so we have to hold the examination board attended by this specialist.

Ms. Monica: How many people compound the examiner board?

Mr. Ryo Washizaki: 15 persons, all are internal.

2.4.- In your opinion, how important is that the researchers include the patent information (prior art information) before they start their research?

Mr. Ryo Washizaki: I think it is important, but if we ask for it, and we are perfect on that, I should be a different counselor.

2.5.- Do you consider that the researchers should protect their science and technology before publishing?

Mr. Ryo Washizaki: Yes, 100% yes, and that is our policy at the organization. For this particular topic the awareness of the researchers is quite high.

Ms. Monica: Is there any reason that explains why do you have this as a policy?

Mr. Ryo Washizaki: No, in order to deliver the research, you must comply with this policy, and we have repeatedly told that policy to the researchers.

2.6.- How does the Research Center attracts funds to bring the technology to the market? Are the stakeholders able to effectively utilize the resources for this purpose?

Mr. Ryo Washizaki: The AIST sees collaborative research quite important because we are doing basic research only, we cannot act as a bridge to society, that's why we think it's important to work with businesses so we can develop the technology.
Since the grant from the government we can expect to be decreasing, it is important to find a good partner so we can jointly develop technology, that's why our researchers are so eager to find good partners.

Ms. Monica: When you receive money from the companies or from the government, do you have any restrictions related with the fiscal year, I mean the time that you effectively have to use this money for research purposes?

Mr. Ryo Washizaki: Yes, we have restrictions.

Ms. Monica: On average, how much time pass since the Research Center receives the money until the researchers receive the money for purposes of investigation?

Mr. Ryo Washizaki: It is minimal, almost at the same time.

3.- Which is the best practice in your experience as a IP person in which IP rights provide more value for the research?

3.1.- Could you please mention a successful case where the industrial property rights increased the value of the science or technology research? What benefits did the researcher, the Research Center and the society obtain with the commercialization of this invention?

Mr. Ryo Washizaki: There is one successful case from the viewpoint of IP on standardization office. We have got a sensor in Tohoku University Center, in Japan, in the Center there is a Professor, Dr. Takeo Ebina, who developed a nano-clay, is a type of a clay and based on nanotechnology he developed a film.

This film is expected to have multiple applications because it has gas barriers properties and because it has transparency and flexible properties.

Professor Ebina was quite good at managing IP and what he probably did in the first place is made a press release of the discovery, first as AIST.

But when we made the press release, we did not mention any detail, we just delivered an abstract of the technology.

Looking at the press release, many businesses ask us, what was the theme and what was the details of the technology, so we arrange a Non-Disclosure Agreement (NDA), then we disclose the details, and by then, Professor Ebina well captured the needs of the side of the businesses.

Professor Ebina well reflected and captured the process on the application, and he also made a priority claim in Japan.

When the technology was initially amended we wanted to show a specific application, but Professor Ebina well captured the needs, he was quite effectively able to impulse the application, so when the technology went published by the patent, it well covered the possible needs from the businesses.

When he launched the collaborative research with the businesses, we confirmed each application of nano-clay, so we made the notification in the industry.

Under the initiative of Professor Ebina, there is a Consortium formed, so we can market the technology, there are many parties jointly collaborating with the technology.

It has been ten years since then, during that time, so many similar technologies have been developed, however, none of them reach the level or intense of the quality of doctor Ebina's technology and what we are doing now is to develop specifications and standardizations, so everyone can tell if a technology reach similar standards or not.

3.2.- I saw that you have an open innovation laboratory, could you please mention how the Open Innovation Laboratory collaborate with the Universities to help them develop basic research to transform it into applied technology?

Mr. Satoshi Kurokawa: For example, we have got an AIST office in the Universities to promote the talent exchange between Universities and AIST. Also we act as an entry to the industry from the University so we can reach a collaboration with the University which has basic science and the industries, by doing so I believe that we can facilitate the technology being marketed.

Ms. Monica: When you provide this services to the Universities, do this services have a cost or which is the arrangement that you have with the Universities?

Mr. Ryo Washizaki: We simply set up our Lab in the University Campus, so when do you say cost, I don't know what do you mean by that, but if you are asking about the rent of the University Campus space, I don't have the details, right now.

Ms. Monica: For example, you go to a University and you have a lab there but when you have the researchers of the University to develop their basic science to the applied technology but this process where you have these researchers in the University, does this has a cost or how is the collaboration.

First of all, we have got all the researchers in our lab in the University Campus and there are researchers who have a role as a researcher in University.

Ms. Monica: The researchers in this lab at the University are paid by the University or by AIST?

Mr. Ryo Washizaki: For the researchers who have this role, definitely he or she are paid by AIST, but I am not sure if 100% is paid by the AIST or not.

Ms. Monica: So, if an AIST researcher develop something with a University researcher, then the rights are divided?

Mr. Ryo Washizaki: Yes, we split according to the intellectual contribution, for example, if we are working with Tokyo University researchers, and if the contribution is 30%, we will pay 30% to Tokyo University and the rest is ours.

3.3.- My next question, I previously ask for a successful case, could you please mention a non-successful case? One that it has some important lessons that you can share with me.

Mr. Ryo Washizaki: There are so many failure cases but if I may say an example in terms of a failure of IP, since the researchers do prefer the invention to be published, they published before making a notification and when we tried to protect the invention, there was nothing to cover by patent. There are so many cases.

Mr. Ryo Washizaki: Our job is to control, they should have control of what should be protected as a know how and what should be protected as a patent, so that the invention looks attractive to the businesses, but if they publish everything there is nothing that we can use, then the businesses do not want to work with us, there are so many such cases.

3.4.- In your experience, which is the best way to share the research results with the society?

Mr. Ryo Washizaki: It is actually a tough question to answer but I think that the development of science and technology is not always the same as the development of industries. AIST of course would like to contribute to the development of science and technology, however, since we are an administrating body our mission is to contribute to the economic activities and we have to deliver that mission, so the researchers should be aware that they should not only pursue the pure science they should also pursue the monetarization of the invention.

3.5.- The last question of this questionnaire is, which factors increase the awareness of industrial property rights among the researchers?

Mr. Satoshi Kurokawa: I think what it is important is that the researchers can casually talk about the invention or possible IP to a specialist, it is important to locate an IP specialist nearby.

Ryo Washizaki: When working in the researcher level, it is much valued, so it is more important to enhance the awareness among managers of importance of IP, so they can electively communicate the importance to the researchers.

Ms. Monica: Thank you very much, I just have one question about something you mentioned before, you said that sixty members belong to the IP organization, and there are other 30 tech transfer members that also help startups, but then you said that the managers are the persons who decide if an application would be made or not, so my question is, these managers are part of the 60 members or the 30 members or do you have these 90 members plus the managers?

Ryo Washizaki: There are manager researchers, so they belong to the research departments, they are the ones who make the decision.

After the application is not, the manager should decide whether we are making an application or not, the examination request or whether or not should apply for a patent outside Japan. In this cases, we will form a board of about fifteen members consisting of the headquarter people and sixty and thirty members of tech transfer and IP office and a patent officer in each department.

Ms. Monica: It is very interesting because is a very huge team.

Dr. Suwa: The patent officer in each department is only in patent activity or are they doubling as researchers?

Mr. Ryo Washizaki: Patent officers are ex researchers and we offer a carrier change for the researchers and if they are interested in pursuing the IP carrier, once the acquire the necessary knowledge, they get such positions.

Ms. Monica: I have one last question, it was mentioned that you organize seminars and other activities to promote IP, how often do you organize this activities?

Mr. Ryo Washizaki: About one per month.

Ms. Monica: Thank you very much for everything.

Appendix 6

Interview with Mr. Takafumi Yamamoto
CEO & President[14]
TODAI TLO, Ltd. Technology Transfer Organization
The University of Tokyo

Date November 22, 2018
Place Hongo Campus of the University of Tokyo
Time 16:00-17:00
Participants Mr. Takafumi Yamamoto, Ph.D Yori Suwa[15], Ms. Tomoko Uno[16], Ms. Monica I. Garcia

Introduction

Mr. Yamamoto kindly receive us in TODAI TLO offices, first, Ph.D. Suwa mention the objective of four-month study cum research fellowship program and pointed out that I am one of the researchers of the program this year, I introduced myself, and the theme of my study.

Mr. Yamamoto gave me some pens including technology protected by a patent, he mentioned that in the agriculture department in Tokyo University invented how to make a nano fiber cheaply and they filed a patent application, so cellulose nano fiber is included in the ink, and this invention has been already commercialized in the pen.

Mr. Yamamoto: You attended the Okinawa Conference so you already know what we do.

Ms. Monica: Yes, I attend the conference, I know, thank you very much. My questionnaire has three different sections, the first one is related with how do Japanese universities motivate, encourage and support their researchers to protect their inventions?

My first question is, which programs and activities have been implemented by the Government and by the University, in this case if TODAI TLO is also involved, to disseminate the awareness of IP among researchers?

Mr. Yamamoto: I am the first person in going through these activities, in the technology transfer businesses from the Universities in Japan, maybe I mention about the story in Okinawa, so when I started with this technology transfer businesses since 1996, in that time most of the faculty members were not interested in filing patents and applications or stablishing a startup company, that's why most of the University people thought that I was crazy, they were not interested in patent filings and doing startups was such a crazy business, but in this 22 years, the University changed tremendously, specially the mind of the faculty members changed tremendously, now as a University of Tokyo we capture over 500 invention disclosure every year. In think MIT get about 500 invention disclosure and in US some universities also have around 500 invention disclosure, so that's why in the year 2013 we got over 600 invention disclosure so I visited the laboratories with my colleagues, most of the faculty members show

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[16] APIC, JIPII

us their profiles and the professors mentioned how the technology contribute to the society. That's why the mind of the professors changed and the biggest reason is, of course getting the royalty income is also important, but the biggest reason is, their goal it is not only research, but also how to contribute to the society; specially when we license our technology to the industry, in that case when the licensee or the company succeed to commercialize University technologies, in that case most of the faculty members become very happy.

That's why every researcher want to contribute to the society and with University-industry collaboration, that's why when I started this businesses, in that time, most of the faculty members didn't know how important was to protect the intellectual property rights, but now in most of the faculty members we have raise the importance of the intellectual property rights. I always say to the professors that no patent, no business, that's why their mind changed tremendously, of course Japanese Government promote the University-Industry collaboration, specially the Ministry of Education and the Ministry of Economy, always make a new role to encourage the University-Industry collaboration. At the University of Tokyo, University of Tokyo is quite different from another Universities in Japan because this graph show us the percentage of licensee in the US, about 15% of the Universities technologies are licensed to starts up companies, in this year, 17.% Universities technologies are licensed to startup companies, and … Universities technologies are licensed to SMES, in this ten years, the share of licenses are almost equal, about 15% of the universities technologies are licensed to startups companies, and half of them are licensed to the SMES, but in Japan, there´s only a few technologies are licensed to startups companies, this is a very big difference from the US and a very big problem in Japan, but at the University of Tokyo in last year, About 25% percent of our technologies are licensed to startups companies, and I hopeful that more technologies are licensed to SMES.

In last year, new thirty startups companies were created from the University of Tokyo, and in the next building is the Incubator of the University of Tokyo, there are about 27 or 28 start companies in next building, and the University of Tokyo is now planning to stablish another three incubators and the second incubator will open in the beginning in next February but now there are about 70% of the rooms has already booked. We have about 350 startup companies for the University of Tokyo, it is a one big difference.

Second problem in Japan, this graph shows the number of patent applications and the number of royalty incomes from the patent, University A is the University of Tokyo and University B is Kyoto University, also Osaka University is located around here, anyway, there are only a few Japanese Universities succeeding in tech transfer, and the other Universities file so many patent applications but they could not make royalty incomes and so many local Universities also are in the same situation, that's why the activity of the tech transfer of the University of Tokyo is quite high compared to another Universities.

As I mentioned about the startups companies, PEPTIDREAM is one of the most successful startup company in Japan, in 2005 we got the invention disclosure from professor Suwa and his colleague Mr. Narita recommended to stablish a startup company and that's why this company in the next year 2006, after that year this company succeeded into IP and because Novartis, GSK are such a big pharmaceutical companies has already prompted with this companies and in last year the prize of this company's stock is most increase company in all of the … company in last year; and five or six years ago the price of this companies stock was most increase than most of the Japanese companies. That's why this successful case is very big.

Pop-in, Mr. Tao Cheng, he came from China, and when he was a University student he stablished his own startup company, Pop-in succeed to buy this company by Baidu.

Do you know Baidu?, Baidu is a very famous company in China is like the Google of China, as you know in China, Chinese people cannot use Google, of course Baidu is not related with Google but this company is the core of google China and he succeeded to have this company bought by Baidu and know this company moved to Roppongi Hills, Roppongi Hills is the name of the building and this building is one of the most expensive buildings for rent, that's why this company is another successful case.

Vedanto Biosciences, we stablished the startup company in Boston, in 2009, we introduced this technology to all of the Japanese pharmaceutical companies but unfortunately there was no interest, so in that case we had to decide to abandon the patent application and communicated with foreign companies, at that time one venture capital was very interested in establishing a startup company and this venture capitalist is located in Boston, that's why we stablished the new startup company in Boston.

Vedanta succeeded and licensed the technology to Johnson and Johnson Innovation, the condition of such licensees is 241 million USD, so it was a very huge deal. There are so many successful cases at the University of Tokyo, professor Suga he invented a kit technology of the PEPTIDREAM, professor Suga has already started another startup company in last year.

Now, so many students are eager to stablish his or her own startup company and of course Japanese government pushed the University of Tokyo to stablish Startups companies, that's why the main reason is how to commercialize the technologies, so every researcher is eager to commercialize the technologies and contribute to the society. This is the biggest reason.

Ms. Monica: I think with the information you provided me almost answer my questions, so I would like to ask how does the TLO collaborate with the University of Tokyo to make the decision of which patents are you going to file and what are the requirements, how do you take the decision?

Mr. Yamamoto: Before that, the University of Tokyo has three departments to encourage the University-Industry collaboration, the Department of University Corporate Relations, this department covers the joint research or cooperate research between companies and the University of Tokyo, they are located in the next room. The TODAI TLO covers the patent filing or licensing. There are two companies UTokyo and UTech, these two companies are the University Venture Capital and when professors or students stablish his or her own startups companies 19:27 UTech or UTokyo invest to the startups companies, especially these two companies are focusing on the university start companies. The head of UTech and UTokyo are located upstairs so, it is very easy to us to communicate with them.

About your question, this is the procedure from the invention to the licensing. Our company, TODAI TLO is a private company, but the 100% of the shareholders of our company is the University of Tokyo, so our company is a subsidiary of the University of Tokyo. We manage all the patent application of the University of Tokyo, and when we meet the researcher, by researcher I mean professors, or associate professors, or someone that make an invention in the university of Tokyo, if they want to file a patent application, they have to report to the University of Tokyo, they have to describe an invention disclosure format and all of the inventions disclosure come to TODAI TLO and after we accept the invention disclosure, in that case we always visit the laboratory and we setup an interview and in this evaluation we evaluate the patentability or marketability of the invention.

For example, if you are Professor Garcia from the University of Tokyo, once we accept the invention disclosure from Professor Garcia, I, Yamamoto will visit your laboratory, after the visit to the laboratory, I will always manage Professor Garcia's laboratory. And, if there is an associate professor of professor Garcia, in that case I have to manage the inventions and patent applications of the associate professor and professor Garcia.

From the viewpoint of the inventors, it is very easy to communicate because in many cases, professors do not know how to make a contract or how to negotiate with the companies, so they just send an email to me, so in that case I will cover all the process, an NDA or license agreement or patent application.

Ms. Monica: I would like to know if you have a Committee, how is conform this Committee to decide which application are you going to file or how the TLO decide?

Mr. Yamamoto: We do not have a Committee. I always recommend to another Universities not to establish an Evaluation Committee, is not meaning, because in many processes they have an evaluation Committee, but in that case professors do not know the marketability of the inventions, so they don't evaluate which company is an appropriate company to negotiate with. We always communicate with many companies, every day, that's why we know which company is an appropriate company and who is the right person to communicate with. That's very important issue, that's why we don't have such a case.

After we evaluate patentability and marketability of the invention, of course we search for similar patent application and then we recommend to the University of Tokyo whether we should file a patent application. After April 2004 , National Universities become independent agencies and after 2004, in this 14 years when we recommend to file a patent application to the University of Tokyo over 99.9% the University agree to us, in this 14 years we have only two cases in which University disagree to us, because in that time one person of the University of Tokyo, he came from the private company, this two cases were his specialty, that's why he disagree, but in this 14 years when we recommend to the University of Tokyo to file a patent application, the University agree to us.

That's why we can make this, but when we don't recommend to the University of Tokyo to file a patent application about 10 or 15 cases a year, the University disagree to us because of different reasons, "This inventor is Vice-president of the University or this inventor is Dean so we have to file the patent" and as I mention before, our company is a subsidiary of University of Tokyo and all of the patent costs are cover by the University of Tokyo, so we have to file the applications.

After that we ask to an outside patent attorney to make the documentation of the patent application and then we start to licenses. From the point of view of the industry TODAI TLO is one stop shop, when every company want to use technology of the University of Tokyo, they have to negotiate with us, that's why we always communicate with company's people and we don't have a Committee to evaluate the patentability or marketability.

Ms. Monica: When you get the money from the companies, can you use the money efficiently, I mean, sometimes the University must follow the fiscal year times and this is sometimes a problem, but as you are private, do you follow the same times as the University or you have your own times to operate the money?

Mr. Yamamoto: Our fiscal year is the same as the University of Tokyo, from April to March and if we got 100yen or 100 million dollars, after we deduct the patent costs and our managing fee, the University of Tokyo distributes 40% of the royalties to the inventors, 30% of the royalty incomes goes to the department of which the inventor belongs to and the last 30% of the royalty income goes to the University of Tokyo. The University of Tokyo become profitable, in our team 2/3 of our colleagues are female, our team is very young team and as I mention before we got over 500 invention disclosure per year, this graph shows the number of patent filing, so green line shows the number of Japanese patent application. Yellow line shows the overseas patent applications and this graph shows the number of contract and this graph show the amount of royalty income, in this year, from April and middle of march we got about 9 million USD as royalty incomes, and these royalty incomes are increasing year by year, in this year from April to end of September, in half year we got 8 million USD as a royalty income, that's why our royalty incomes are

increasing year by year. Next year our royalty income will go down because we had a stock options of the licenses and this stock options will end this year, anyway it is ok.

Ms. Monica: How important is for the commercialization that the researchers protect their inventions before they publish?

Mr. Yamamoto. As you know the patent system is different from country to country, so if they publish, if they release the application we cannot file the patent application in European countries, so now the technology has no border, in many cases as I mentioned, we establish our startup company in Boston, the number of overseas licensing are increasing year by year, and I don't know the reason but German companies are very interested in using our technologies, that's why number of licensing cases to German companies are increasing. Of course, the number of US company's presence are also increasing, so if they publish the research, maybe we don't want to file the patent applications. We have a very easy way to file the patent application, we use the US provisional patent application, in the case that the professor wants to publish their research results, in next week we can file the patent application in one day, that's why is not difficult for us to file the patent application in one day.

As you know US Universities always use a provisional patent application, so in that case we use the provisional patent application, is the easiest way to file the patent application.

In Okinawa I mentioned that there are no best practices.

Ms. Monica: In your opinion, do you think that the awareness of IP among the researchers is enough or do you think still being an issue and it should be raised the awareness of IP among the professors?

Mr. Yamamoto: As I mentioned before, now in the University of Tokyo we have got so many invention disclosures and we always send an email or make a phone call to the laboratories directly. Of course, we provide some sort of IP lectures in several departments, may be next month our vice-president will make a IP lecture to engineering department and another department. We always hold such lectures.

Phd Suwa: Are this lectures for students or professors?

Mr. Yamamoto: Those are for professors and associate professors., for students we have some kind of lectures, but we didn't hold lectures for students this year, last year, we held one lecture to the students.

Phd Suwa: Have you always have lectures for the professors?

Mr. Yamamoto: Specially when a new professor came from another University or raise from associate professor to professor, in that case the University of Tokyo always hold several lectures about different lectures and our IP is one of the lectures.

Ms. Monica: Do you have many lectures during the year?

Mr. Yamamoto: Maybe if we stop providing the lectures, the invention disclosures are increasing, that's why I don't worry about the situation. When we reject to file a patent application, is very tough for us because most of the faculty members are eager to file patent applications so, sometimes I have to visit the laboratories with my colleague and in that time I have to mention the reasons why we don't want to file the application, it is a very tough process to us.

That's why the mind of faculty members has changed tremendously now.

Ms. Monica: When you decide not to file a patent, do you give the right back to the professor, so the professors can file by themselves.

Mr. Yamamoto: Yes.

Ms. Monica: I would like to ask about a non-successful case related with the protection and commercialization of IP.

P.hD. Suwa: I suggest that you ask first for the main components of the successful cases from the perspective of IP rights.

Mr. Yamamoto: There are many reasons, the technology itself is very important.

For example, this is a type of radiator, Komatsu make constructing machines, and now Komatsu is a licensee of the University of Tokyo, they are using a new type of radiator in all of their constructing machines, but in the beginning of this session, I was to introduce this technology to Komatsu or another companies, they didn't believe the performance of the new type of radiator and of course, we had a test and we had AP test, but the first two years they wanted to make a new type of radiator by themselves, so when we wanted to license this technology to another company, Komatsu people ask us to stop to introduce this technology to another companies, because this companies were foreign companies.

In that time new regulations from the Japanese government appeared, one related with the regulation of air in the atmosphere that came from the machines and the other related with regulations of noise pollution, so in that case the radiator could cover both regulations. That's why Komatsu decided to be licensee, and in many cases, new technologies cannot be understand in the beginning, so it is a little tough for us to negotiate and to explain how the technology is useful.

In many seminars or meetings, the President of Peptidream always mentioned that the patents of University of Tokyo are very fine, so that's why they succeeded stablishing the startup company and collaborate with pharmaceautical companies. Of course, filing a patent application make stronger, so make a patent application is very important for the University of Tokyo. Especially if the professor wants to stablish his or her startup company, IP is the key to success in the startups companies, I think.

If you want to know about failure cases, there are so many failure cases, in our company, maybe you can find some, if you visit the Ministry of Education website, oh sorry, there is not English version, but anyway if we get 100 patent applications, about 30% of the patents are licensed, they succeed to license, 70% of the patent applications we cannot license.

But I have heard that in the US, the Universities license 25% of the patent application, in that case, this University is quite a successful university, that's why 30% of the patent application is not so bad number, we cannot license the other 70%, so there are so many failure cases in our University.

We are now discussing about how to approach to the Asia companies or another European companies, because as I mentioned the numbers of overseas licensees are increasing year by year, but most of our international licensees are European Us companies, that's why we would like to license our technologies to Mexico, for example.

Now we are planning to stablish some sort of units of University collaborations and as I mentioned, most of our licensees are startups companies or SMES, of course we know big companies in every country, L'Oréal in France or Nokia in Finland, but if we want to approach to the SMES in that case we cannot know which companies are very active using the university technology or which company is looking for the university technology, is a little tough for us. So, where is your University located in?

Ms. Monica: It is located on the west part of Mexico.

Mr. Yamamoto: Your University can evaluate which company or SMES company is very active to collaborate with the University, in this case, if this company wants to collaborate with the Japanese University we can reach to the appropriate company in Mexico. Also, if your University want to approach to Japanese companies, of course, there are so many, Sony or Toyota, but if you want to approach to this companies or meet Japanese companies, it will be very tough for you to understand our reach the appropriate company and who is the right person to communicate with. In many cases, as you might know, most of Japanese companies are very bureaucratic, very slow to make decisions, of course they will say, Oh! It is very nice, they always say that, but they cannot make decisions, that's why in Japan we have to find the appropriate person to communicate with, this is a very important issue for the University. That's why about three years ago, currently members of the university's people wanted to approach to NBC, NBC is a very big company, but they didn't know who was the right person to introduce the technologies and NBC was very interesting in the robotic technologies. So I introduced the key person of …I don't know if they succeeded to license the technology, but came into this, if we exchange the information together, we can build some sort of University network in the world, so in this case, we could approach to the right company to commercialize the technologies. For this reason, we are planning to make collaboration with overseas Universities.

Ms. Monica: We are open to collaborate with you if you are interested in the market in Mexico, it is a huge market.

Mr. Yamamoto: Currently we don't have a successful licensee case in Mexico with Universities or Companies.

Appendix 7

Interview with Ms. Yukiko Cooper
Assistant Manager
Technology Development and Innovation Center
Okinawa Institute of Science and Technology Graduate University

Date November 26, 2018
Place Skype interview
Time 10:00-10:50
Participants Ms. Yukiko Cooper, Ph.D Yori Suwa[17], Ms. Tomoko Uno[18], Ms. Monica I. Garcia

Introduction

After Ph.D. Suwa mention the objective of four-month study cum research fellowship program, I introduced myself, and the theme of my study, then we continue with the questionnaire.

Questionnaire

1.- How do Japanese universities motivate, encourage and support their researchers to protect their inventions?

1.1.- Which programs and activities have been implemented by the Government and the University to disseminate the awareness of IP among researchers?

I don't think we have A program established by the government as far as I know there is none, we have not implemented anything any program that is established by the government because I don't know any of those.

Instead we have or I am programs we provide a new employee with that short orientation of IP with a general information about IP about what is a patent what, is a trademark in our policies in OIST Related with this so everybody students, researchers even administrative tech, these communication is mandatory for everybody. After that the researchers received or the regular seminars, and may be once a year our staff make visits, we go to labs and we give them a presentation for five minutes, just to keep in mind that IP is what did we do with IP, but We don't visit all labs, Some labs done really produce any protectable IP, there are from social science studies, they don't do anything related with industrial property rights, so we prioritize for example material science and computation, informatics labs rather than social sciences.

What I think it is not a program but it is a good way to get familiar with it and make friends with those researchers, they usually tell me what they are doing so if they are doing something interesting, we actively get involve in the lab.

[17] Senior Researcher, APIC, JIPII
[18] APIC, JIPII

1.2.- In Mexico, the researchers have a lot of activities, they are professors and they have administrative activities, so I'm OIST is there any incentive for the researchers so they can focus on research?

We provide only PI's with sabbatical leave options, they can up to six sabbatical months, leave away from management and administrative tasks, they can do whatever they want as long as it is related to their research, but just for PI's and no Japanese PI's could leave but not Japanese PI's, maybe is the only thing I can think of.

Ms. Monica: Sorry what is PI's?

Ms. Cooper: It is Faculty Members, effectively.

1.3.- Ms. Monica: Thank you very much, do, in your opinion, how value and recognized is the effort of the professors to protect and commercialize the results output?

Ms. Cooper: It is a difficult question, I think, we value it, of course, we are IP staff but it is not so much recognized, is always in the back door, only who get involved in, value it, recognize it, but not all, not the general society, unless it is a technology with a Nobel Prize, or something with big prizes awarded, if not is not so much recognized, but maybe you can put in the CV, for example if your own invention is patent...or commercialized, you can put it in your CV, maybe that's the only way to be recognized.

Ms. Monica: In OIST, it is consider in the performance evaluation?

Ms. Cooper: I am not involved in the faculty evaluation, but they can put in the five-year report, every five years each research lab has a review and they need to list everything they can, there is no section about Patent filing but they can include it in other sections.

Ms. Monica: Currently, could it be considered that IP awareness among the University researchers is still being a problem?

Ms. Cooper: Oh yes, definitely, the publication is their first priority, and the patent filing maybe they disclose the invention to IP staff, as we take care of it and that's ok they can put in the CV and say "my technology is patent filed or commercialization is something they need to work with is and that can be awarded.

So, IP awareness is a problem, it is a complicated process a patent, they think that publishing is good for the society, so the think, why do we need to protect or IP, so it is our activity to convince them that the protection is very important to promote and to contribute to the society, but it is a problem To understand why they need to protect while they can publish and everybody can see, so it is a problem.

2.- The second section of the questionnaire is related with the most important factors which the professors and researchers should know for protecting and commercializing the research output?

2.1.- How is the procedure to determine if the University will submit an application to the patent office?

We hold an internal evaluation Committee, they disclose the invention to us and we first internally in the IP office evaluate, if is bad we just reject, but if it is good enough we take it to the Committee which includes external experts, an IP attorney, and our internal staff, the Vice-president and external IP experts evaluate if it is worthy to file the patent application form.

Ms. Monica: How many people integrate the Committee?

Ms. Cooper: About 10.

Ms. Monica: From this ten, how many are external members?

Ms. Cooper: Just 1.

Ms. Monica: Is this external member from the industry or from other institution?

Ms. Cooper: Is from a law firm, from the attorney office.

Ms. Monica: What do you consider for the evaluation?

Ms. Cooper: For the evaluation it is patentability and the IP expert, because our external expert is a lawyer attorney so he or her is most about this patentability, of course we consider commerciality but our technologies are usually so early, so basic, nobody knows really, so we struggle with this point. And even when the attorney comes and say so much about this business point, so this is our point in the Committee. Now, I am thinking that maybe we need to invite another external expert, does not have to be lawyer qualified, but industrial, maybe a retired person, and we ask him/her what he/she thinks based on his/her experience, this is basically the two points. An importance third point is if the researcher that developed the technology can continue in OIST, people come and leave so often, so tech transfer takes time, two years, three years, five years, sometimes 10 years. Sometimes the researchers come to OIST and after two years of research, they invented something, we file a patent, then it is the time when they leave OIST for another Institution. Without the main researcher we can't really do tech transfer, so this is the third point that we consider, the continuation of the inventors.

2.2.-What happened when the University decides not to make the patent application, does the University grants the right to the researchers to file the application by themselves?

Yes, we just simply return the right to file a patent to the researchers, and we explain what involves, they need to pay for everything, they can do whatever they want, but they need to pay.

2.3.-How does the University assess the importance of the Patents, utility models, and industrial designs? Does the University make this process internally or do you hire external IP firms for this purpose?

To decide whether or not we file a patent application, like I said we do an evaluation Committee including an external expert, after the patent filing, also we ask an attorney to write a draft, everything, all professional jobs are made by external firms. When we receive office actions, we internally consider but mainly rely on the professional expertise.

2.4.- In your opinion, how important is that the researchers include the patent information in their research, when I say patent information, I mean the prior art search before start a research.

They don't consider prior art search or patentability, or anything when they start the research, research interest purely comes from their own interest, because we are a basic research institution and we, the IP

office members are told that we should not interfere in the primary role of the researchers, which is basic research, so they do not really consider. Just, you know, for OIST is not important at all.

2.5.- Do you consider that the researchers, should protect their science and technology before they publish?

From my point of view yes but at least they need to disclose to us, is it from my point of view or their point of view.

Ms. Monica: It can be both, what is your point of view and which is the point of view of the University.

Ms. Cooper: Protection, I don't know, It is hard to say, no all publication or research is patentable or IP protective, so they need to understand what they need to protect as IP, I think that education is important, so I can say that in social sciences is science, but it is not patentable science, if it is the case, they don't need to think about protection but they need to understand what we can protect through IP system, once they understand what IP is about, what we can protect through global system, then they need to decide whether they need to disclose to us.

2.6.- How does the university attract funds to bring technology to the market? and Is this process bureaucratic?

Ms. Cooper: From external sources?

Ms. Monica: Yes, from external sources.

Ms. Cooper: We provide internal gap fund, that of course comes from the government, so that's external source, but we internally distribute, so we negotiate with the government to convince them, we are basic research institution and one of the big missions includes the sustainability of Okinawa, so there is a big gap between two big missions and the fund is required, this is how we convince the government to get funds.

Ms. Cooper: Is this process bureaucratic, what do that means?

Ms. Monica: For example, in my University, we receive funds from external sources, for example from companies or sometimes additional funds from the government, this money is received in the central administration, then the money goes to the campus and maybe after three months the researcher will receive the money for the research. But sometimes is complicated because we also depend on the fiscal year, out of this time we cannot use the money, if for example we receive money on September or October, maybe the researcher will receive the money until march or April, sometimes happens to us.

Ms. Cooper: Yes, it is the same here, the fiscal year definitely matters, it is quite quick to make the decision, who is awarded for giving the money, it is a very quick decision, because it is internal process, and only our office handle it, pretty much, so it is quick. However, to do this tech transfer activities, usually the researchers would hire somebody because they are basic researchers, they are not for example developers or technicians, these are extra activities, so they would hire a person, but they need to have the money in the budget first to start the process of hiring, but nobody around Okinawa has such results, so they receive the money first, then they start the hiring process, it takes 6 months before a new person comes. The researchers won't start the hiring process and then this person comes, but money have to arrive first to start the hiring process which is about six months, in that sense it is bureaucratic.

3.- The last section of my questionnaire is related the best practice in your experience as a university IP person, especially in which IP rights provide more value for the research?

3.1.- Could you please mention a successful case where the industrial property rights increased the value of the science or technology research? How was this procedure for protecting and commercializing the invention?

Ms. Cooper: Increase the value? Maybe through recognition increase the value. Value was already there in the science of the research but because it went to the tech transfer process it came to something tangible, people from the society can see it, and maybe they just realize the value of what they have. A good example for our basic researchers is about Corals, the see Corals that was tech transferred to a Coral Research Company, so Okinawa people think that OIST is doing something huge, something very high level science, but what we do is directly relate to the environment, so may be that increased the value of the science here.

Ms. Monica: Could you please tell me the name of the Professor that developed this technology?

Ms. Cooper: Yes, professor Satoh.

3.2.- In this case, which benefits did the researcher or the laboratory or the society had that you identified?

Financial benefits no, of course we paid for patent filing cost, but the small sense of contribution is priceless really, the researcher himself, he came to Okinawa few years ago and his research contributed to the local environment, the licensing revenue really seems to be minimal, it does not even pay off our patent cost but the sense of contribution to the local society I think is the biggest benefit and the awareness of what we do among the local community.

3.3.- Could you please mention a non-successful case in which may be it was a failure protecting or commercializing the invention, but if you can share with me some important lessons of this case.

Yes, we have more non-successful cases, first, protection without strategy, is more like the fear to loose opportunities, in the invention evaluation at the Committee, nobody knows if this is useful or not, maybe useful maybe not, but if we decide not to file we just lose the opportunity, so we just file it anyway, we have the money, so no strategy, but those cases, 90% they are not going to be tech transfer, because there is not a strategy, just because of fear to lose opportunity and fear to make a decision and say no, we file a patent anyway, but no successful and also it is similar to what I said before without researchers being on side here it is hard to tech transfer, you know patent filing, patent information should cover everything, patent information, publication should cover even more about the researcher but a company needs to talk to the researcher with a lot of communication required before actually that technology is a product. In that sense, absence of researchers on side it is not going to be successful, there are many cases.

3.4.- In your experience, which is the best way to share the research results with the society.

Ms. Cooper: Can you rephrase this question.

Ms. Monica: Yes, I think you already answered part of my question, you mentioned the difference between the areas of study and you said that for example, in human sciences there are no patentable science or technology so, it is ok if they publish, but in your opinion which way do you think is the best or it depends of the area of study.

Ms. Cooper: Yes, I think what you said is my thought, patents or IP rights is not always the best way to share the results, patents or IP rights is just one of the tools, and publication can be just good enough to share the results with the society, especially for early technologies because effectively by filing a patent,

few companies hesitate to tech transfer, they don't want to pay money, they don't want to contact because it is patent filed, but if it is just a publication they just copy what they wish, so I think a patent is a good way but is not a way for all research areas.

3.5.- Which factors encourage and increase the awareness of industrial property rights among the researchers?

Ms. Cooper: Which factors?

Ms. Monica: Yes, in your opinion which is the best way to motivate or encourage the researchers?

Ms. Cooper: The researchers and IP office, they are two different creatures, they have their own interest, we have our own interest, so the researchers want to hear what other researchers think about tech transfer because what we say is not always the first interest, but if another researcher or a direct colleague says that tech transfer is really good, it is helpful. If some researcher has a good experience in tech transfer that influence other researchers, so I think that is the best factor.

Maybe, the experience includes money incentives by royalty distribution, the researcher may receive some money and they will spread it and say, if you do this may be you can receive some extra cash for your pocket or maybe they will say "I worked with local community that was really good", anything but the experiences by the researchers help to influence other researchers, I think.

Ms. Monica: Talking about the incentive scheme, which percentage do you share with the professor in case of commercializing the invention?

Ms. Cooper: We are going to change the scheme to increase the incentives for researchers, but the current scheme is that first, pay off the patent filing cost and when is all paid up we distribute 1/3 for the University, 1/3 to the research lab and the remaining 1/3 goes to the inventors, but to be honest, patent filing cost is huge, so not many tech transfer distributes royalty to the inventors, so we will change the scheme maybe, maybe within a few months, so the patent filing cost won't be paid off, we bare the cost anyway. As soon as we receive 1 dollar or 100 dollars as a royalty fee, we will immediately distribute 1/3 to the inventors, that would definitely increase financial incentives.

Ms. Monica: So you will not deduct the cost of the patent filing, for example you will share directly to the researchers, and labs and the University.

Ms. Cooper: That's our plan, but currently we first pay off the filing cost, it will take too long before OIST recover, so to be honest, no one probably gets unless we get a million-dollar royalty fee.

Ms. Monica: One last question, how many licenses did you have last year?

Ms. Cooper: Last year, four.

Ms. Monica: Do you have startups or spinoffs?

Ms. Cooper: We have two, those four licensing agreements includes these two, we make an exclusive license agreement with startups. Our own internal startups.

Ms. Monica: I think I don't have any other question, I really appreciate your time and thank you very much for all the information.

Ph. D. Suwa: Excuse me, may I ask you two more questions, first, do you have any training programs for increasing IP awareness for professors, not for students.

Ms. Cooper: For professors no, we offer a seminar for all researchers, but only a couple of faculty members, professors turn up, so we usually go to the labs for talking to professors rather than provide training sessions.

Ph. D. Suwa: How often are this training sessions?

Ms. Cooper: Seminars are maybe once or twice a year.

Ph. D. Suwa: For each laboratory?

Ms. Cooper: No, seminars are for all the researchers, but visit to each lab maybe once a year, but we talk a lot to professors anyway, is not formal programs required too much, because usually a professor is one of the inventors, so once they disclose the inventions to us, we need to talk to the professors anyway, those who already disclose the invention to us, we have frequent contact very much. Those who have not disclose anything to us, may be once a year.

Ph. D. Suwa: And the last question is, the leader of your TLO is a business person or a scientist, research person?

Ms. Cooper: Yes, he is from Academia.

Appendix 8

Interview with Professor Kosuke Kato

Ph.D. RTTP

Head of Planning, Section, Co-Innovation Division, Office for Industry-University Co-Creation, Co-Creation Bureau

Osaka University

Date November 27, 2018
Place Skype interview
Time 11:45-12:25
Participants Professor Kosuke Kato, Ph.D Yori Suwa[19], Ms. Tomoko Uno[20], Ms. Monica I. Garcia

Introduction

Ph.D Suwa talked about the program of research, and I briefly introduced myself and my theme of study to Professor Kosuke Kato. Because Ph.D Suwa and I attended the congress in Okinawa and we met professor Kato there, we already knew some information about Osaka University, in addition Professor Kato kindly shared with us additional information about the university, some data and programs that have been implemented.

Professor Kato: I look at the questions you sent, I can answer each question one by one, but I think you joint this year the Conference in Okinawa, so when did you developed this questionnaire?

Ms. Monica: I prepared this questionnaire may be by the end of August.

Professor Kato: I think your questionnaire, your scope and idea of technology commercialization in your country may be change after you took the WIPO course, so would you like an answer to each question or I can propose, suggest and advise a more comprehensive point of view, which one would you like?

Ms. Monica: I prefer that you give me your comprehensive point of view, I understand too much experience, I have seen that Osaka University is awarded as the most innovative University here in Japan and I read about the program that you have for supporting proof of concept so I am very interested in your point of view.

Professor Kato: If you are interested in commercialization, the patent filing is important but I think an important aspect are market and incubation and the researchers are human resources development, so do you know the word faculty development?

Ms. Monica: No, I don't know it.

Professor Kato: It is a faculty member; I mean researchers or scientist. I think that a combination of this three things is the three of the most important things that you should implemented in your country.

[19] Senior Researcher, APIC, JIPII
[20] APIC, JIPII

Ms. Monica: I have seen also in your web page that you also organize seminars, I found information about three or four years ago, do you still organizing seminars for the researchers to talk about IP and its importance?

Professor Kato: Do you mean about Gtech? It is still in preparation for sophisticated training course for faculty members and I that providing training courses to the faculty members in combination with the best practices, I mean the successful stories by one or two innovative researchers.

Ms. Monica: I have seen how is organized your office and I think they have different assignments and is very interesting, I would like to know how do you work together and how is the collaboration with the industry, especially for transferring the technology because sometimes is complicated to approach to the companies and convince them that the technology from University it is useful and it could be good for them, sometimes they do not trust the University, from your experience, I would like to know you deal with this, how do you approach to the companies, how do you look for this collaboration with them.

Professor Kato: So, you are talking about how to develop mutual trust to the industry and the University, you need time and you need to develop one or two successful cases first, you need to develop an innovation ecosystem and a technology commercialization system at the same time, human resources and system, both are important.

If a company is interested in University's technologies or IP, then that company can be a good client, your potential partners.

Ms. Monica: How do you share the technologies or the inventions that you have with the industry, do you organize some conferences, meetings or do you call them directly?

Professor Kato: Mainly we have three ways to access to the industry, in most of the cases, University researchers directly communicate with the companies via academic conferences, they already have relationship with the industries, that part is the most important part in the number of contracts, it is mainly developing by this pass way. The second choice is directly make a telephone call or email marketing to the Industry by the Technology Transfer Organization, through a marketing agency. The third one is, our office organizes new technology exhibition or new technology proposing companies, so on average 100 to 150 companies will participate in that Conference, then we can select some meetings with the industry.

Ms. Monica: I also checked in your website that you have an invention assessment Committee and I saw that there is one person from the Japan Science and Technology, I would like to know about this Committee, who integrate this Committee and if there are some external persons involved, for example, from the industry, how do you deal with conflict interest that in some point could be presented.

Professor Kato: That process does not provide much value, most of the decision making whether or not we are going to file a patent is vending on the recommendation from the technology marketing company based on the analysis of market; the asses of marketability and patentability.

Ms. Monica: Is this technology marketing company is external or internal.

Professor Kato: It is internal.

Ms. Monica: Does this company only work with Osaka University?

Professor Kato: It works with multiple Universities.

Ms. Monica: And internally, don't you have a Committee to decide, do you just trust on the recommendation of this company to decide whether or not to file a patent?

Professor Kato: The recommendation is pretty low by external companies so maybe about 20 to 30%, we file 50% of the invention disclosure. Osaka University decides whether we file a patent or not.

Ms. Monica: And does this IP officers integrate a Committee; how do they take the decision?

Professor Kato: The Committee just includes internal IP office members

Ms. Monica: Do you know how many members do this Committee has?

Professor Kato: About 12 members.

Ms. Monica: As you are working directly with the commercialization of the inventions, how important do you think is that the researchers protect their inventions before publishing?

Professor Kato: We recommend the faculty members, the researchers to file the patent before publish academic papers or present an academic conference.

Ms. Monica: If for some reason they publish the invention before, do you file the application?

Professor Kato: Mostly not. Only in few conferences which Japanese Patent Act number 30 accept filing patent within 6 months after the presentation, but we do not provide financial support to faculty members if the publication is done at such domestic conference.

We strongly recommend the inventors to file a patent, specially one month before the publication, they should summit the disclosure to the Technology Transfer Division Office.

Ms. Monica: When you receive money from the companies, are you able to utilize this money effectively, without bureaucracy. How much time pass since you receive the money until the researcher receives the money for continuing with the research?

Professor Kato: Normally two months is enough, but it depends of the complexity of the project and normally if they don't chance the Osaka University format for research agreement, just two months are enough.

Ms. Monica: When you license some technology or invention, which percentage of the royalties are for the inventor?

Professor Kato: 1/3 and after deducting the cost of the patent application.

Ms. Monica: What benefits have you identify that the researchers or their laboratories or the society have with the commercialization of the inventions?

Professor Kato: I think only 20 to 30% of the faculty members are interested in commercializing their technologies, so if we target them, the motivation is divided in four parts. One is purely interested in the commercialization to the social contribution, I mean for the benefit of the society; they also have interest

in providing students to good companies, they have relationships, so the students are seeking good companies to work, that is the second. Also, this kind of Industry-University collaboration for doing research is a good opportunity, especially for engineering school students for doing practical things about technology, so doing research together, doing education together and finally doing networking.

Ms. Monica: In Osaka University the current state of IP awareness among the researchers, do you think is still being a problem or you just have enough researchers that are aware of this topics, the protection and commercialization of the inventions?

Professor Kato: Again only 20 to 30% of the faculty members are interested in technology commercialization, but the situation is changing because the money coming from government to Osaka University is decreasing year by year, so the researchers, specially who could not get granting for scientific research are seeking for money for their research.

Ms. Monica: This could be a factor that encourage the researchers, do you consider that there are another factors that encourage the researchers to protect and commercialize their inventions?

Professor Kato: I think they need access to a good story and a good memory about similar faculty members, pointing out the innovator early and after maturity. We are now facing early maturity; we are seeking to take from early maturity to after maturity. In early maturity they will move after hearing about a good memory or a story about early to after maturity. We uploaded successful stories and good memories of previous researchers who succeeded in the research commercialization or IP filing, so we printed them when we have some training course for faculty members or public relations with the faculty members.

Ms. Monica: Finally, I would like to know more about this proof of concept program, I have some information but what is special about this program? Who are the beneficiaries of this program?

Professor Kato: University Institutional Proof of Concept Program benefit the university in three ways:

1.- The first one is integration of knowledge. If we hire advisory board members who understand technology and market at the same time. With directly communicate with these advisory board members about the IP or technology developed by each university. So you can apply to a government grant for technology commercialization, but you cannot get much information from the judges (examiner board members). But if you develop an institutional University Proof of Concept Program, then you can communicate and develop a relationship with the expert people who knows about the future market and the innovative technologies. That is one of the most important benefits that you can acquire by having an Institutional Proof of Concept Program.

Also, you may have a chance to get some mass of money from government by implementing this system. If you are trying to get a government grant for technology commercialization, you should pick up one technology. So, we are going to develop this kind of Institutional Proof of Concept programs. The government gives our office for ten proof of concept projects, so we can communicate with the government, if your university is the largest university in scale, maybe you have the chance of develop such kind of system in your university.

Ms. Monica: For example, when you have these advisory board members from the industry, do you work with them with a non-disclosure agreement? or how do you work with them? because they are on the industry.

Professor Kato: In fact, consent for confidentiality and we don't hire industry persons, they have industrial experience, they know about the future market and innovative technologies, not knowing about the current market, they know about the future market, those people are mainly from venture capital firms, who invest to the university or early stage technologies. You can find those persons in that community.

Ms. Monica: So they know about the industry but they are not working directly with the industry.

Professor Kato: Or they have a public mission. We clearly indicate in the proposal the requirements of the people, core proposal, deadlines, and they sign confidentiality.

Ms. Monica: Since how many years have you been working with this program?

Professor Kato: Since 2011, that mean that this is the eighth year of the program.

Professor Kato: The third benefit of implementing this program is the standardization of your office work. This is very important, sometimes such kind of office hire some industry person and they act solely, they don't collaborate with the other office members, but if we implement this proof of Concept Program, they must access with the industry experts, they must communicate to this kind of judges who knows about the future market and they must deliver the expert feedback to the principal investigators or inventors. Those processes represent real commercialization coordination work itself, that is very important.

If you hire people from industry just for confidence, I mean the reliable of their own idea, it is already old the information, we should access the US information and innovative future market forecast, we should use, not only their own brain but also the teammate's brain and the other expert's brain; depending on the case of technology commercialization.

Ms. Monica: It is very interesting for me to know about this program, thank you very much.

Dr. Suwa: Could you please mention a successful and no successful case?

Professor Kato: That depends, if you are interested in a very big contract or one by one step study case. Regarding the last one, there is a case of innovative measurement control system developed in the University, this case includes IP and how we can commercialize university technologies.

While managing industry-academia projects concerning an innovative measurement control system under development at XYZ University, I collaborated with the PI, the PI's students, IP managers, university research administrators, patent attorneys, government staff, domestic and overseas universities, and domestic and overseas companies in many ways. My major roles were market research, IP management and licensing support, and sponsored research project management. This kind of case will inspire other researchers.

On the other hand, principal investigator at Osaka University developed a method to enable chemical powder reaction without solvent (liquid) under a laboratory scale, but it was necessary to scale up in a big reactor, so a potential licensee launched an incubation laboratory inside Osaka University under a joint research agreement.

Ms. Monica: Thank you very much for your time and the valuable experience that you shared with me.

Appendix 9

Interview with the JPO

Date: November 29, 2018
Participants: Policy Planning and Research Division, Administrative Affairs Division
International Cooperation Division, Trial and Appeal Division

Questionnaire

1.- What are the programs and strategies of the Japan Patent Office (JPO) to promote and raise the awareness of Industrial Property rights among the Universities and Research Centers?

1.1.- Which programs or activities have been implemented by the JPO to disseminate the awareness of industrial property rights among researchers in the Universities and Research Centers?

The Japan Patent Office (JPO), based on requests from universities and research institutions, sends its staff to them to give lectures designed for their researchers about intellectual property (IP) issues. As a recent example, JPO staff delivered a speech mainly for researchers at the University of Aizu in Fukushima on October 20, 2018.

1.2.- I have heard from other interviews that the JPO has sent experts to the Universities in order to help them with the process of protecting their inventions. Could you please talk about this program?

The JPO sends its IP experts called “intellectual property advisors for university-industry collaboration” to small and medium-sized universities and colleges that have been advancing industry-academia collaborations for promoting commercialization of their research results. This has been done to support them, focusing on the ways for managing intellectual property in their projects based on industry-academia collaboration for promoting commercialization of their R&D activities with partner companies.

Reference: Major support activities

1. Provide advice to formulate intellectual property strategies for projects based on certain business models;
2. Analyze information on patents and markets in the areas of the projects;
3. Support industry-academia collaboration activities with partner companies;
4. Provide advice on how to clarify inventions that are needed for promoting commercialization of R&D activities; how to acquire patent rights for these inventions; and the ways for utilizing the patented inventions in a portfolio of intellectual property rights; and
5. Provide support according to the ongoing progress of each project, including support for conducting clearance searches for patents, etc. to check whether their business activities or products are likely to infringe intellectual property rights of others.

Also, for universities or research institutes that have been advancing R&D projects, to which public funds were invested with a hope of innovative results, the JPO sends its experts on IP management called "intellectual property producers" to support the R&D projects. The support activities include formulating strategies to utilize the achievements of the projects from the perspective of the effective use of intellectual property rights; and IP management for the projects.

Reference: Major support activities

1. Develop IP policies;
2. Establish a base for IP management;
3. Provide advice on formulating strategies for R&D activities and commercialization of R&D results based on the utilization of patent information;
4. Establish IP strategies; and
5. Provide support for utilizing the successful outcomes of the projects.

1.3.- There is a training course organized by the JPO named "Training Course on Promoting Public Awareness of IP," is there a training to promote Awareness of IP focused on people from Universities and Research Centers?

The JPO provides a training course on Academia-Industry Collaboration and Technology Transfer. The target participants are mainly people from Universities and Research Centers involved in intellectual property management or utilization.

1.4.- Does JPO provide courses for using Platforms for prior art search? For example, J-Plat Pat.

The JPO provides training courses, including lectures on prior art searches using specific platforms, such as J-Plat Pat and google patent.

1.5.- Does the JPO collaborate with other government offices to promote and raise the awareness of IP in Universities and Research Centers?

Currently, when it comes to raising the awareness on the importance of intellectual property, the JPO itself conducts public awareness campaigns on IP, rather than in collaboration with other IP offices. However, in the future, it could be an option for the JPO to raise the awareness of the importance of IP in cooperation with other IP offices that are providing support for IP activities by universities.

2.- What are factors that the Universities and Research Centers should consider when making an IP application to JPO?

2.1.- Which incentives does the JPO provide for the Universities and Research Centers to protect their inventions through industrial property rights in Japan?

In the JPO's understanding, when universities acquire patent rights for their research results, their partners, i.e. Japanese companies, can promote commercialization by utilizing the rights for the research results without worry or fear, and can avoid unnecessary lawsuits filed by third parties. Also, such universities can take the initiative in developing new technologies based on their achievements.

Meanwhile, researchers can spend licensing fees for the patents on future R&D expenditures, so as to further develop their research activities.

2.2.- Are there incentives from the JPO to help Universities and Research Centers in the procedure of international applications?

The JPO is now coordinating to reduce filing fees by 50% for international applications under the Patent Cooperation Treaty (PCT) from April next year.

2.3.- One of the options for Universities and Research Centers applicants is to request Accelerated Examination and Accelerated Appeal Examination. Could you please mention a case in which a University or a Research Center benefited from each process?

When universities and public research institutions file patent applications, their applications can undergo accelerated examinations without additional fee. When accelerated examinations are conducted, applicants can receive the first office action earlier, compared to regular examination.

In appeal against an examiner's decision of refusal cases for patents, where all or some of the demandants are universities, junior colleges, or public research institutions[21], appeals are subject to accelerated appeal proceedings. When demandants file a request for accelerated appeal proceedings, they can obtain the results of the proceedings earlier, compared to regular appeal proceedings.

2.4.- The JPO has different ways to ensure the communication with between users and examiners, in the case of Universities and Research Centers, what are the main options of communication for making the process efficient and accurate?

One option of communications with examiners at the JPO is interview examinations. When applicants request examinations for their patent applications, and if interview examinations are conducted, applicants are able to better understand the intentions of examiners' reasons for refusal. Also, applicants' technical explanations about their claimed inventions may enable examiners to deepen their understanding of the technical details. As a result, interview examinations help ensure smooth communications between examiners and applicants. Also, based on the needs of users, the JPO can conduct interviews using its videoconference system and circuit examinations, for which the JPO sends its examiners to conduct face-to-face interviews with applicants and their representatives throughout Japan. Nonetheless, please note that JPO's interview examinations may be done to every applicant, and not limited to universities and public research institutions.

2.5.- Does JPO obtain feedback from Universities and Research Institutes users to identify their particular needs?

We dispatch JPO staffs to Industry-Academia cooperation department in universities and they hear the opinions on support measures at each university.

[21] "Universities and junior colleges" mean universities, junior colleges, and technical colleges under Article 1 of the School Education Act; or national colleges under the Establishment Act at each ministry/agency or the Act for Establishment of Incorporated Administrative Agencies. "Public research institutions" mean national or public research and development institutes; or research and development institutes that belong to inter-university research institute corporations established under the Act of National University Corporations; or research and development institutes under the Act for Establishment of Incorporated Administrative Agencies, etc.

3.- Which is the best practice in your experience as an IP person in the Japan Patent Office?

3.1.- How do you consider the relationship between the Universities and the Research Centers with the JPO?

When considering the fact that around 40% of Japanese researchers are university researchers, the JPO believes that universities have high potential of R&D activities. Based on this, if universities and Japanese companies cooperate with each other to utilize the results of R&D activities in universities, this will lead to further developing Japanese economy. To achieve this, it is essential for the JPO to work in cooperation with universities, in order to ensure that intellectual property rights will be granted to useful research results of universities.

3.2.- Do you think that the IP awareness among the researchers still being a problem in Japan?

The JPO is aware that some university researchers do not sufficiently understand the importance of acquiring intellectual property rights for their research results.

3.3.- In your opinion which factors could encourage and increase the awareness of industrial property rights among researchers?

The JPO believes that it is useful to raise the awareness on the importance of acquiring IP rights for valuable research results by, for example, providing information on successful cases of acquiring patent rights and unsuccessful results due to failure in acquiring patents.