Session 2.4
Collaboration with Industries and University and Contribution to the society

Jun SUGIURA
OIT  OSAKA
JAPAN
Profile  Jun SUGIURA

日本特許庁
（Japan Patent Office: JPO）
初代長官 高橋是清
（The first Commissioner Korekiyo TAKAHASHI）

欧州特許庁
（European Patent Office: EPO）
欧州特許条約（European Patent Convention: EPC）に基づき設立された
地域特許庁

在モロッコ日本国大使館
（Ambassade du Japon au Maroc）
The fourth industrial revolution is expected with the use of Big Data and AI (Artificial Intelligence) through technological innovations in AI and IoT (Internet of Things) etc.

Proper management, analysis, and learning of a collected big data is a key to sharpen an industrial competitive edge.
2-1. About IoT related technologies

Development of IoT related technologies

Rapid progress is being made in research & development and application to business of “technologies that utilize information obtained by connecting “Things” to networks, thereby finding new values and services” (IoT (Internet of Things) related technology).

<Example>
A sensor for detecting road conditions transmits information of road traffic vibration to a server. The server provides appropriate maintenance information by assessment of road conditions including uneveness of roads from the vibration information.

<Example>
A sensor attached to a parcel transmits location information to a server. The server provides a shipping carrier with an optimum delivering route based on the location information and information on traffic congestion on the Web as required.

Transport Infrastructure
Ex.) Road maintenance

Industrial robots
Ex.) Extraction of optimum working conditions

Housing
Ex.) 24 hour remote watching system

Animal husbandry
Ex.) Evaluation of health conditions

Automobiles
Ex.) Unmanned taxis

Agriculture and forestry
Ex.) Prediction of crop yields

Disaster prevention
Ex.) Prediction of flood

Healthcare
Ex.) Healthcare using wearable device

Construction machinery
Ex.) Decision of maintenance timing

Railway
Ex.) Adjustment of operation intervals

Office equipment
Ex.) Management and supply of consumable items

Logistics
Ex.) Real-time tracking

Life line
Ex.) Adjustment of supply of power

Utilizing information (collection, analysis)

Utilizing information (control, notification)
Towards the Super-smart Society
(Role of university)

• Human resource development, capable of responding to the 4th industrial revolution: (EDUCATION)
  • Practical education through industry-university-government collaboration based on the needs of industry
  • Strengthening mathematical and data science education
  • Compulsory education of "programming" in elementary school

• Construction of ecosystem of innovation: (R&D)
  • A university that is the base of knowledge and human resources, as a core, involves industry, so that research and development and venture are created spontaneously and continuously, so that the fruits of innovation can be invested in the next kind of innovation.
  • Base of Connected Industries
Why are Universities important in Research and Development?

- Universities have 20% of total research funding.
- 38% of researchers work for universities.
- The level of academic research is among the best in the world.

**Research Funding**

- Universities: 20%
- Total: 19 trillion yen (3.6 trillion yen)

**Number of Researchers**

- Universities: 38%
- Total: 850 thousands (330 thousands)

Source: Ministry of Internal Affairs and Communications, ‘Research survey report on science and technology’ (2017)

People expect universities to exploit their research outcome for the society.
Contribution to the Society became the 3rd mission of Universities.
The Prime Minister said, “Japan’s universities are undergoing a transformation. We will strengthen the academia-industry collaboration system and aim to triple corporate investment in universities and research and development entities over the next decade.”

Significance of cooperate investment

- Companies’ needs activate academic research.
- Universities contribute to the society by creating innovation.

For the Scale up of Joint Research (Guideline)

→ Strengthen the management system in universities
→ Commitment to the results
→ Equitable sharing of expenditure
Invention (idea), Innovation (products) and IP

The roll of IP is to bridge Invention to Innovation
Basic Business aspect for Tech. transfer

1. Matching Seeds to Needs
2. Design & Managing Business Procedure
In fiscal year 2016, the number of joint researches between universities and private companies was 23,021 increasing 10.6% or 2,200 compared to the previous fiscal year. The amount of research funds received by universities for joint research with private companies was around 52.6 billion yen, increasing 12.6% or 5.9 billion yen compared to the previous fiscal year.

Achievements of Joint Researches at Universities


* Universities include national, public, and private universities or colleges, including junior colleges, public and private colleges of technology, and inter-university research institutes.
In 2017, the number of patent applications filed by universities in Japan was 7,281, marking a 0.8% increase from the previous year.

### Top 10 Filers (Universities 2017)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name of University</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>University of Tokyo</td>
<td>310</td>
</tr>
<tr>
<td>2</td>
<td>Tohoku University</td>
<td>276</td>
</tr>
<tr>
<td>3</td>
<td>Kyoto University</td>
<td>229</td>
</tr>
<tr>
<td>4</td>
<td>Osaka University</td>
<td>210</td>
</tr>
<tr>
<td>5</td>
<td>Tokyo Institute of Technology</td>
<td>194</td>
</tr>
<tr>
<td>6</td>
<td>Nagoya University</td>
<td>164</td>
</tr>
<tr>
<td>7</td>
<td>Kyushu University</td>
<td>158</td>
</tr>
<tr>
<td>8</td>
<td>Hokkaido University</td>
<td>116</td>
</tr>
<tr>
<td>9</td>
<td>Keio University</td>
<td>113</td>
</tr>
<tr>
<td>10</td>
<td>Shinshu University</td>
<td>103</td>
</tr>
</tbody>
</table>

Source: JPO Annual Report 2017
The number of IP rights and income from IP activities by universities have been on the rise. In fiscal year 2016, which ended in March 2017, income from IP activities by universities reached 2.576 billion yen, marking a 4.0% decrease from the previous fiscal year. Also, the number of IP rights being actually used by universities reached a record high of 13,832 increasing 16.5% year-over-year.
Collaboration **Business expert with IP expert**
The basic function of IP right (1)

The principle roll of IP Is Exclusive right for Idea (IP itself does not make Profit)

It Is The business which make the profit
The basic function of IP right (2)

**Basic patent vs. Improved patent**

- Not only **Basic patent**
- But, **Improved patent** has also **Exclusive right**
The basic function of IP right (3)  Utilization of patent information

Capture development trends in specific technical fields

Trends by number of applications on purpose

→ Develop development indicators of universities and companies.

Trends by number of applications on usage
Basic IP aspect for Tech, transfer

Before launching projects

Establish IP Policy

Initial Stage of Projects

Establish a base for IP management
- Support making rules on IP in the project.
- Set up a decision making body on intellectual Property.
- Formulate IP strategy.

Stage of Advancing Projects

Enhance IP management
- Extract all of the inventions out of the projects.
- Support creating a strong patent portfolio.

Final Stage of Projects

Review achievements of IP activities and share information
- Get the picture of all of the IP from the project.
- Confirm the way of IP management and exploitation after the project completion.

After completing projects
<table>
<thead>
<tr>
<th>University</th>
<th>Company</th>
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</thead>
<tbody>
<tr>
<td><strong>purpose</strong></td>
<td><strong>Business, social contribution</strong></td>
</tr>
<tr>
<td>Education, research, social contribution</td>
<td>New business</td>
</tr>
<tr>
<td>Acquisition of research funds</td>
<td>Defense of company’s products etc …</td>
</tr>
<tr>
<td>Publication of research results</td>
<td></td>
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<tr>
<td>Student development</td>
<td></td>
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<tr>
<td><strong>Attribution of research results</strong></td>
<td></td>
</tr>
<tr>
<td>· Share by equity according to the degree of contribution</td>
<td>· Share by equity according to the degree of contribution</td>
</tr>
<tr>
<td>· Change stance by the created results</td>
<td></td>
</tr>
<tr>
<td><strong>Implementation of research results</strong></td>
<td></td>
</tr>
<tr>
<td>About the result of sharing, University would like to change stance</td>
<td>· Companies want to use created results exclusively</td>
</tr>
<tr>
<td>depending on the result.</td>
<td></td>
</tr>
<tr>
<td><strong>Compensation for self-implementation</strong></td>
<td>(1) If a company monopolizes, pays compensation fee if sales or profits</td>
</tr>
<tr>
<td>University want companies to pay compensation fee, regardless of whether</td>
<td>come out.</td>
</tr>
<tr>
<td>whether companies implement the patent or not</td>
<td>(2) If the company is non-monopolized, no compensation will be paid.</td>
</tr>
<tr>
<td><strong>Patent application expenses</strong></td>
<td></td>
</tr>
<tr>
<td>If the company implement the patent, the company should pay the patent</td>
<td>Companies want to pay patent cost according to their share</td>
</tr>
<tr>
<td>cost</td>
<td></td>
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<tr>
<td><strong>For publication of research results</strong></td>
<td></td>
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<tr>
<td>University would like to publish in principle as an academic achievement.</td>
<td>· Until the research results are marketed, basically companies want to</td>
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<tr>
<td></td>
<td>avoid publishing.</td>
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<td></td>
<td>· companies want to close the core area technology and make it know-how</td>
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<td><strong>Stance against Student handling</strong></td>
<td></td>
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<tr>
<td>University conclude a contract with students according to the rules of</td>
<td>· Companies allow the student’s participation in condition that</td>
</tr>
<tr>
<td>the university. As University can’t manage students, Professor supervise</td>
<td>University taking on the responsibility of the students.</td>
</tr>
<tr>
<td>students, Professor supervise students.</td>
<td>· Companies allow students to take part in the research in condition</td>
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<td></td>
<td>that Students have the same obligation as the university</td>
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Osaka Institute of Technology

OIT Four faculties in three Campus

Umeda Campus
• Faculty of Robotics & Design

Omiya Campus
• Faculty of Engineering
• Faculty of Intellectual Property

Hirakata Campus
• Faculty of Information Science and Technology

Osaka Institute of Technology
Industry Accademia collaboration of OIT

(Number from 2013 to 2017 FY )
Industry Accademia collaboration of OIT

(Income from 2013 to 2017 FY (1000 yen))

Joint research
Contract research
Consultant research
OIT Patent Filed

Year | Total of Patent Application | Patent Filed owned by University
--- | --- | ---
2010 | 7 | 2
2011 | 4 | 3
2012 | 10 | 5
2013 | 7 | 3
2014 | 8 | 3
2015 | 7 | 3
2016 | 8 | 1
2017 | 4 | 3
2018 | 7 | 3

No. of application

Total of Patent Application

Patent Filed owned by University
設置大学別 登録件数推移（工大）

2019年3月31日現在

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<td>1</td>
<td>4</td>
<td>2</td>
<td>0</td>
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</table>
1. Wide variety scheme

(1) By Engineering Div.
(2) By Design Div.
(3) By IP Div.

① “Engineering + Design + IP” team collaborate service
   a. OIT-P, b. X-port

② Services offered directly by IP Div.
   - Consultation
   - Seminar & Education
   - Collaboration with bank

2. Characteristics of collaboration

(1) Not only for big company but also for SME

(2) Focus on client’s needs

(3) Find the client based on collaboration with local chamber of commercial & BANKS

3. Fusion of education and industry-academia collaboration for the OIT students

- Ai-Spec: Problem solution oriented contest
- Patent Idea contest:
  Utilization of stocked patent to some business
Implementing intelligent equipment to societies enriches the lives of all generations of people.
An open innovation base founded by Osaka Chamber of Commerce and OIT

Facility services for members
◆ Offer apparatus (ex. 3-D printer, laser processing) to make “Prototype products”
◆ Conference hall, Study rooms

Content of Projects

1. Exchange project
   (1) Business Plan contest, (2) Net working program, (3) Project Based learning program with students

2. Training project
   (1) Design thinking, (2) Innovation Mechanism, (3) IP basic knowledge for business

3. Prototype production support

4. Overseas collaboration program

5. IP related advice
# Intellectual Property Related Advice Service

## Free Consultation

- Individual consultation
- Introduction some special organization

## Realize Business, Joint Research, TT

## Subject | Contents
--- | ---
**Human Resource Development Support** | • Seminar, Symposium,  
• Visit teaching  
• IP education for researchers

**IP Management Suggestion** | • IP management Manual  
• Support for Tech Transfer  
• Internal development

**Innovation Support** | • Patent, Design, Trade mark, Copy right, Trade secret  
• Litigation  
• Survey prior art, Paten map
Contribution wit local society “KAWAKAMI Village” in NARA Pref.
By the OIT students renovation of Primary School through using local Wood (YOSHINO SUGI).

Contribution with local society “KAWAKAMI Village” in NARA Pref.
Proposal: Teaching “How to use Patent Database to SME researchers.”

Patent Idea contest: Utilization of stocked patent to some business

Proposal: Applied a human movement watching technology to a music creation system
Conclusion

OIT of the students, by the students, for the students
ご清聴ありがとうございました。
Thank you very much for your attention

Jun.sugiura@oit.ac.jp
Jun SUGIURA
杉浦 淳