

**WIPO REGIONAL SEMINAR ON TECHNOLOGY TRANSFER BY  
UNIVERSITY AND PUBLIC RESEARCH INSTITUTIONS THROUGH  
THE STRATEGIC USE OF THE PATENT SYSTEM**

**December 9-11, 2009**

# **Opportunities and Challenges for Open Innovation**

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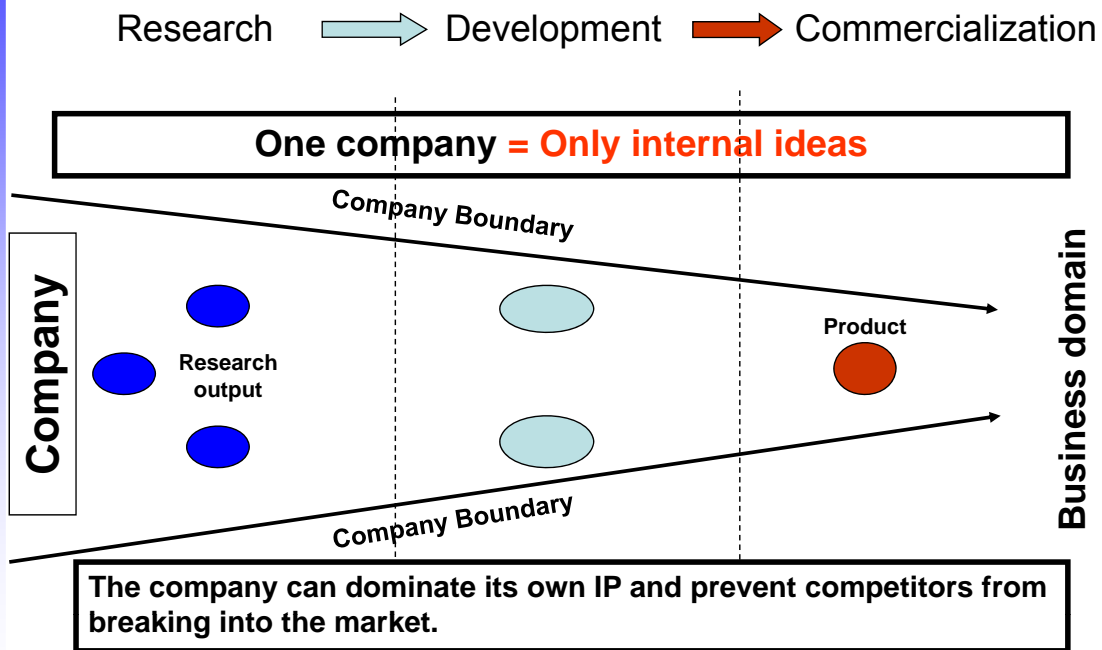
**Director for IP Exploitation Policy Planning Coordination  
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Japan Patent Office (JPO)**

## **Topics**

### Opportunities and Challenges for Open Innovation

- Closed innovation model & Open innovation model
- The role of universities and research institutions and current status under open innovation era
- New challenge: IP strategic producer

## Closed Innovation Model

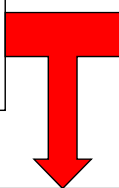


## Development of “Open Innovation”

< Changes in the environment surrounding innovation >

Increased sophistication / complication of technologies and shorter product lifecycles

Development of IT and worldwide knowledge sharing



< Development of open innovation >

- Smooth flow of knowledge/technologies between outside players is a very important factor.
- A company should choose an optimal R&D system utilizing the advantages of both closed/open-innovation depending on the market or the type of technology.
- Overseas companies have been globally carrying out their business activities effectively utilizing advantages of both types of innovation.

# Challenges in each entity

## Big companies

- Select & concentrate on particular technology
- Give priority to short-term solution
- Leave long-term research

## R&D Ventures

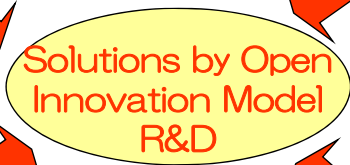
- Have knowledge in particular field
- Lack of resource in other fields
- Lack of skill

## SMEs

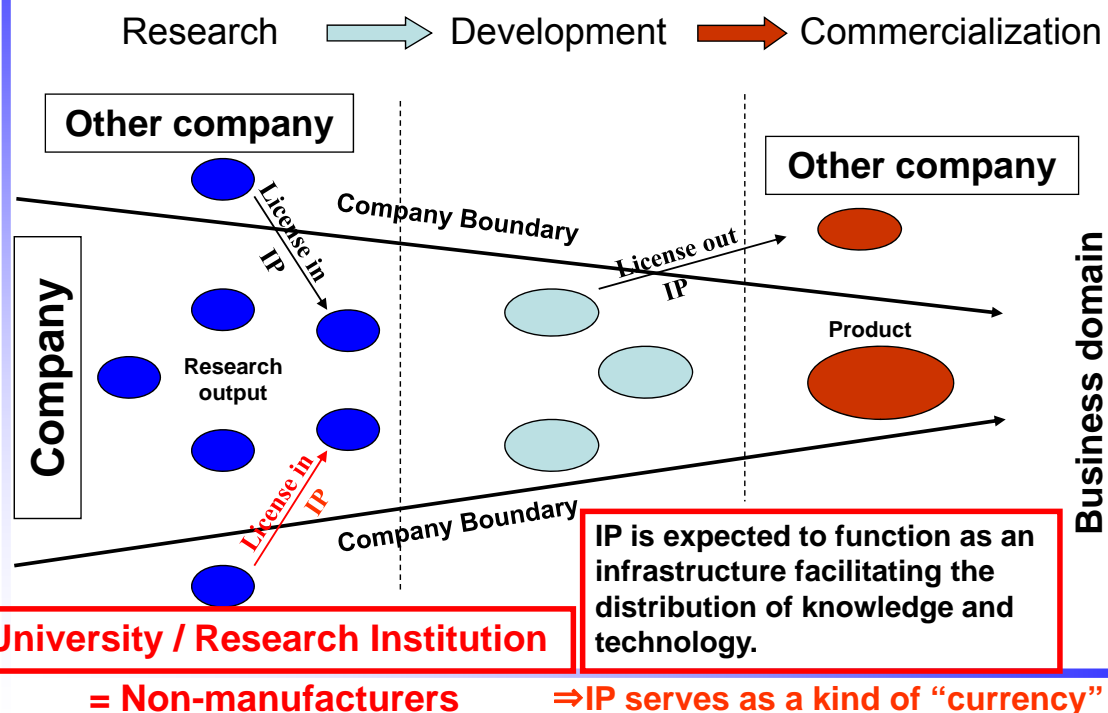
- Have much skill
- Have manufacturing resource
- Lack of knowledge

## Univ. & PRIs

- Carry out basic & long-term research
- No manufacturer
- Not much research fund



# Open Innovation Model

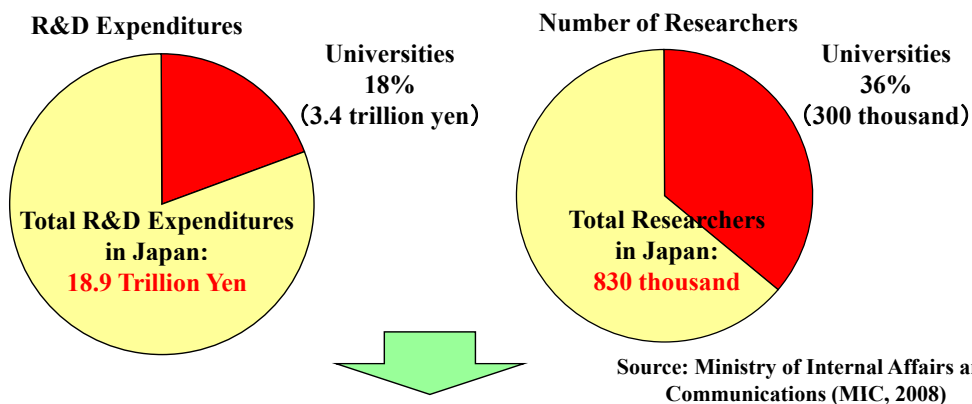


## Type of Open Innovation

- Typical example –  
→ depending on objectives & exit strategy
- 1. R&D cost reduction:  
The model aiming at reduction of investment on R&D in a company by introducing external technology besides internal technology.
- 2. Standardization:  
The model aiming at formation of standard technology by pooling a patent of each company, particularly in the technology in which a standard is formed of a set of two or more technology.
- 3. Needs initiative:  
The model aiming at collecting and bundling inside & outside technology which can solve the subject set up at the company.

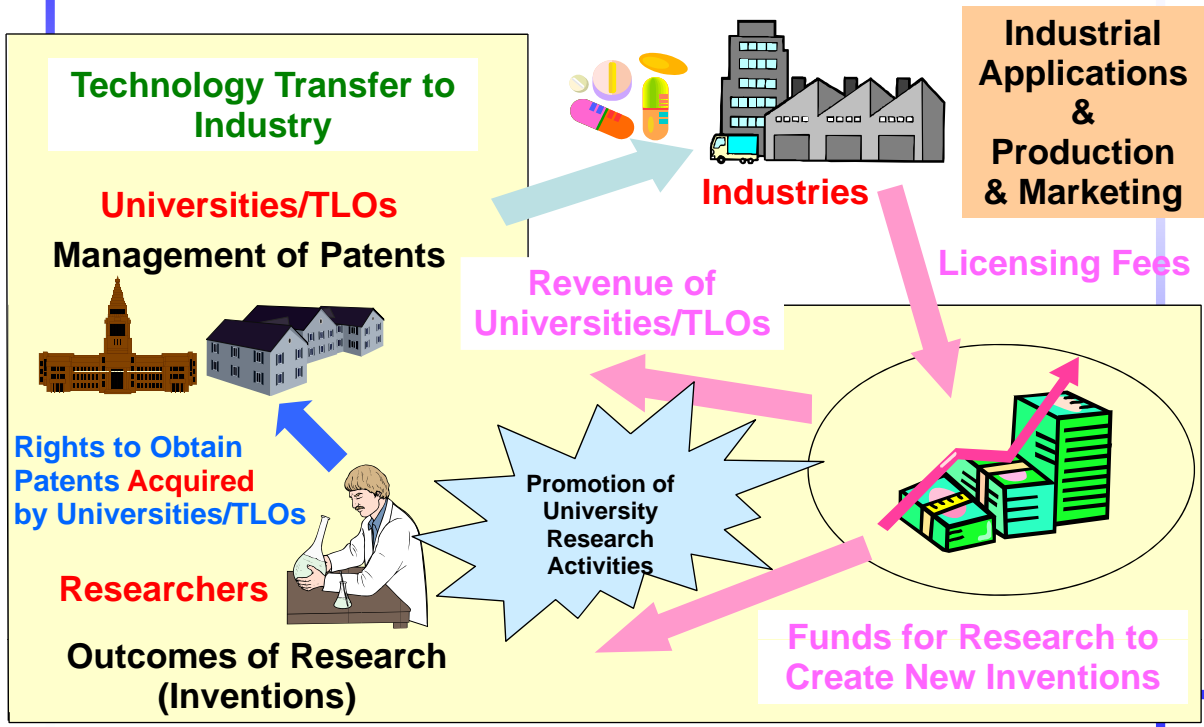
## Current status of R&D in Japanese Universities

- ★ 18% of total R&D expenditures in Japan are by universities in Japan.
- ★ 36% of researchers in Japan work for universities in Japan.



The mission of Japanese universities is the promotion of **“education,” “academic pursuits,” and “contribution to society.”**  
 In the field of the intellectual property, universities having rich research funding and human resources are expected to promote industry-academia-government R&D, return the fruits of research to society, and turn out competent researchers.”

# Promotion of University Research Cycle through Technology Transfer



# Issues on IP Management in University

IP created in universities had been considered the **private property of the researchers**.

As there was **no systematic and strategic means** to exploit research results,

- IP tended to become dead stock.
- Research accomplishments failed to be introduced to society.

- 1. Change of the Principle of Patent Ownership**  
Private Researcher  
→ **University Organization** (Systematic and strategic IP management)
- 2. Promoting Partnership between Universities and Industry**

**Goal: Promoting Creation and Exploitation of Intellectual Property from Universities by using Intellectual Property Cycle**

## Promotion of Attribution to Organization

### ☆ Policy of attribution to organization in principle

Following the institutionalization of national universities since 2004, the intellectual property in the universities has been attributed to the organization in principle.

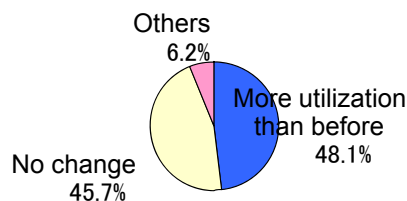
### ☆ Merits of attribution to organization

- Systematically organized correspondence for easy excavation / protection of inventions.
- The problem of patent cost for the researcher due to the attribution to individuals and the burden for the license agreement has been solved.
- By the unification / facilitation of license agreements, etc. with enterprises, etc., the recovery of an appropriate consideration for technology transfer and the return on investment to the universities, etc. and the researchers have been achieved. → facilitating commercialization
- With respect to the problem of the obscure handling of research performance (patent, etc.) due to the attribution to individuals, transparency has been secured by attribution to the organization.

## Change of Innovation Circumstances

- 50% of Japanese companies have come to utilize the research results of a university or a public research institute more than before.
- Positive use of the external resource has been progressing.
- Independent operation (closed model) and positive IP strategy (open model) are utilized flexibly.

Q: Have you come to utilize the research result of a university or a public research institute more than before through collaboration on the R&D process in your company?

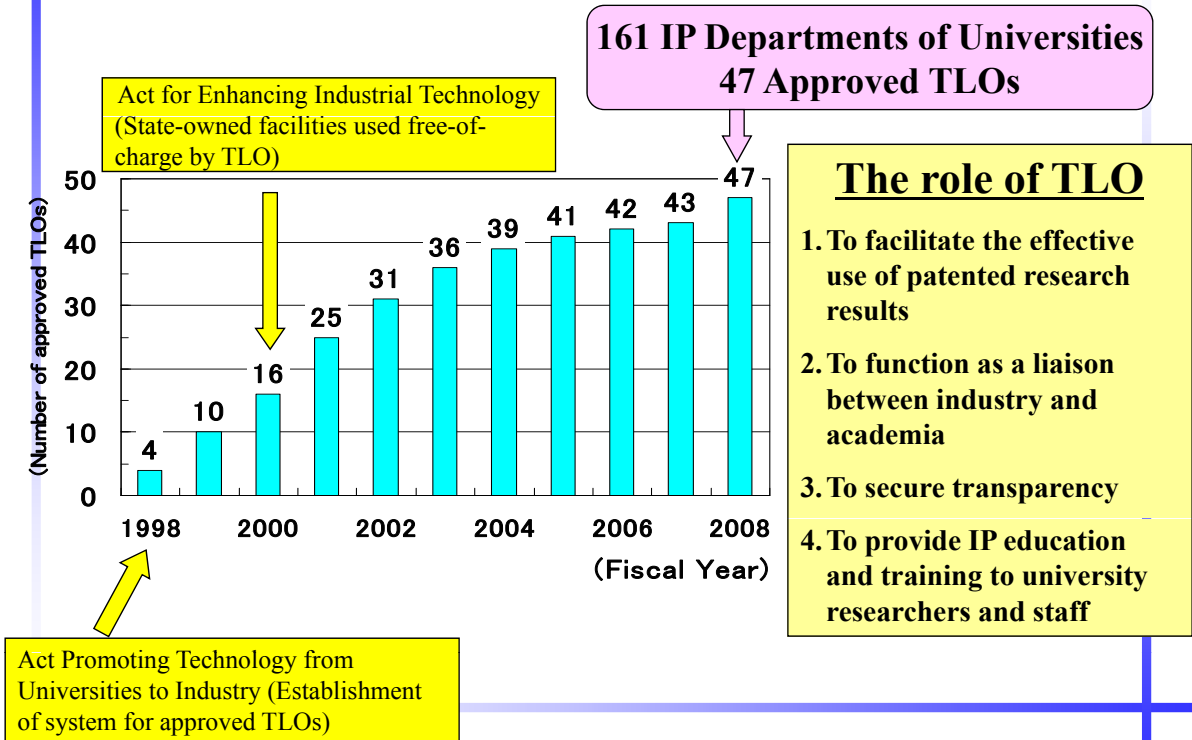


### Typical reasons for choosing “More utilization than before”

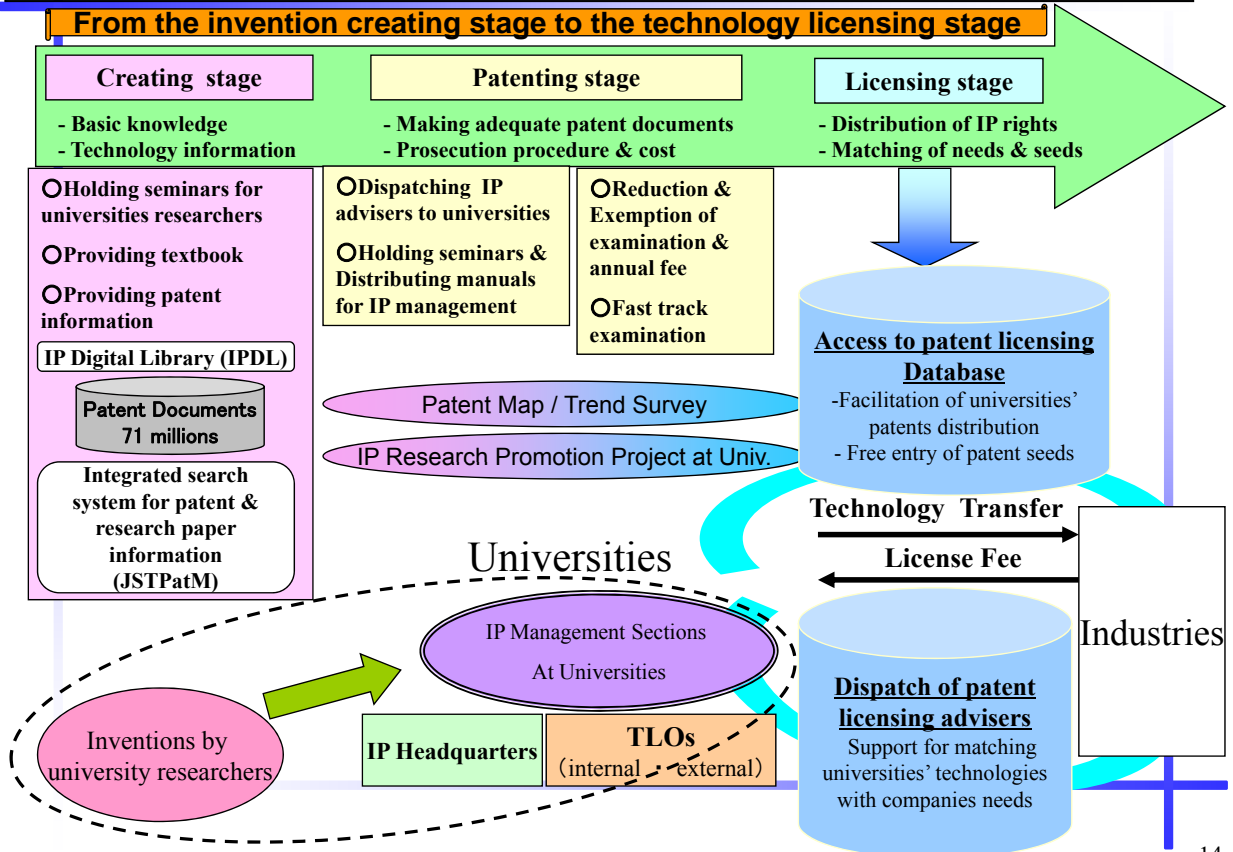
- < Government Policy on IP system >
  - Establishment of IP headquarters and/or TLO in university
  - Japanese Version of Bayh-Dole Act
- < Other factors >
  - Change of management from independent operation to outside resource utilization

Source: Nippon Keidanren IP committee “Result of the survey for IP policy evaluation” (March 18, 2008)

# Construction of System for Managing / Utilizing Intellectual Property in University



# Comprehensive Support Measures for Universities



## Status of Collaborative Research between Universities and Industry

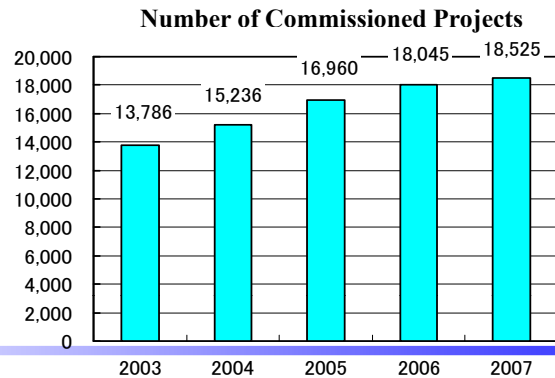
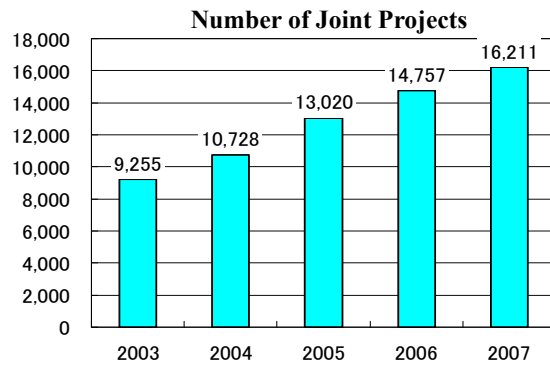
### Joint Research

A university and a company share human and financial resources in a research project.

### Commissioned Research

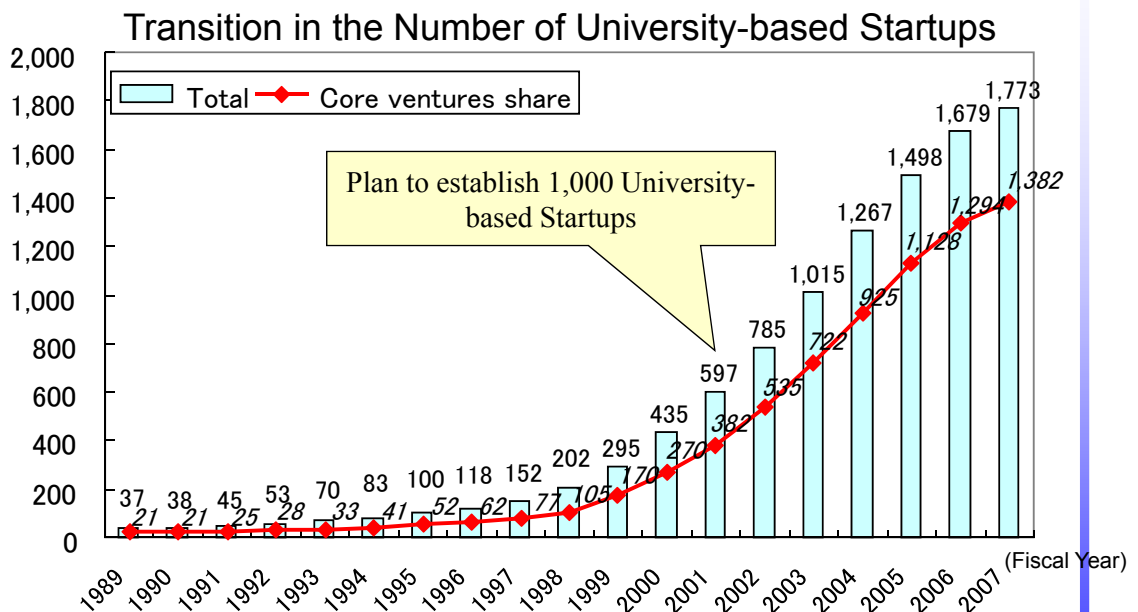
A university accepts a research project outsourced by a company, public-service organization, etc.

Source: Ministry of Education, Culture, Sports, Science and Technology (MEXT)



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## University-based Startups (Ventures)



Core ventures: "Venture businesses founded based on research performance generated in universities" & "Student's venture businesses related deeply to universities"

Source: Ministry of Economy, Trade and Industry (METI)

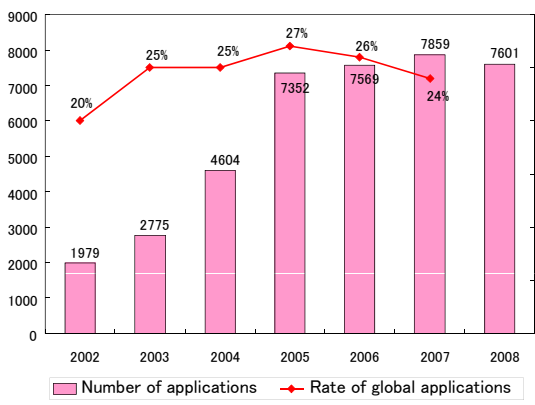
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# Patent Applications by Universities and TLOs in Japan

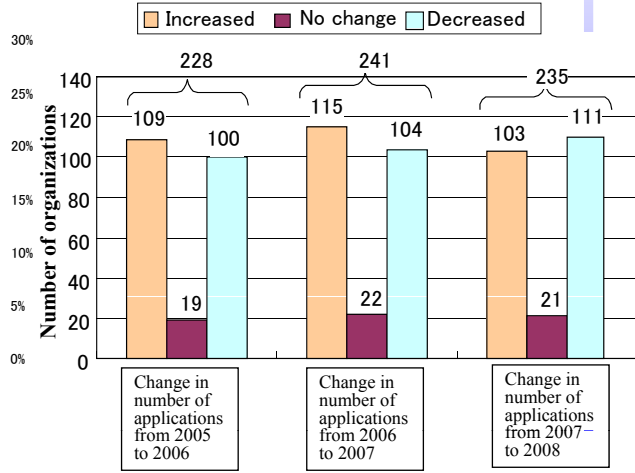
★ The number of patent applications from universities rapidly increased until 2005 and leveled off in 2006.  
 ★ From 2007 to 2008, the number of patent applications has increased 44% (103/235) of Japanese universities and decreased 47% (111/235) of Japanese universities.  
 ⇒ Strategic intellectual property activities have been performed by each university.

Number of patent applications from universities and TLOs



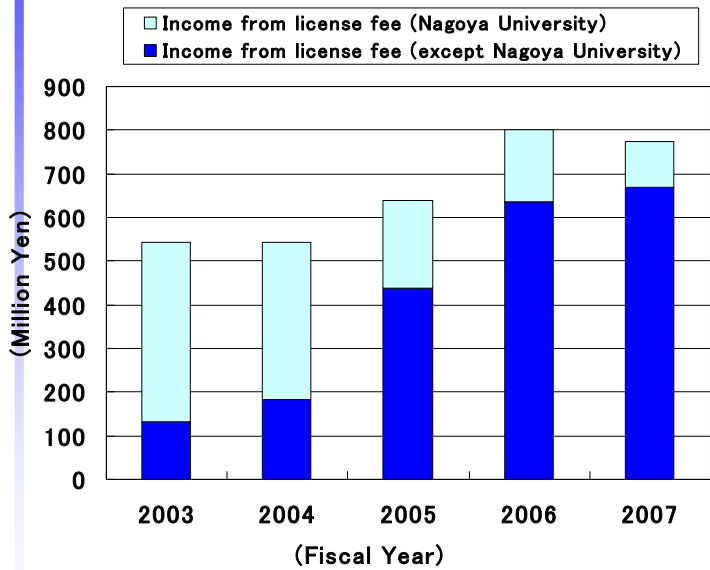
Rate of global applications: rate of applications filed in foreign Offices among all applications filed in JPO.

Increasing-decreasing tendency of patent applications from universities and TLOs



Source: Japan Patent Office (JPO)

# Change in Patent License Income of Universities



※ Income from patent license.

Change in number of universities with income from patent license

Fiscal Year	Number of Organizations
2003	32
2004	47
2005	83
2006	98
2007	109

Source: Ministry of Education, Culture, Sports, Science and Technology (MEXT)

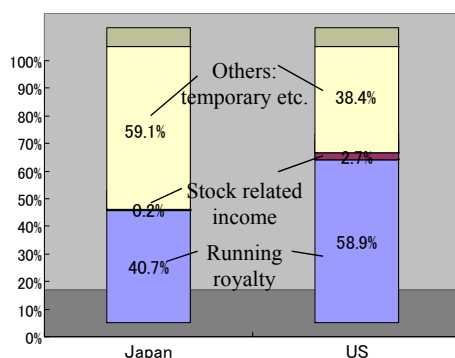
## Licensing activities in Japan and U.S. (1)

	Japan	U.S.
IP offices / TLOs in universities	204	157
Notices of invention	9,438	19,827
Patent applications	7,601 (2008)	10,468
Patents granted	886 (2008)	3,258
License cases	5,538	25,109
Income from patent licensing	1.16 Japanese Yen	US\$ 2.08 billion

(source)  
 ・The numbers in Japan in 2007 from the IP Headquarter  
 ・The numbers in US from AUTM survey in2007

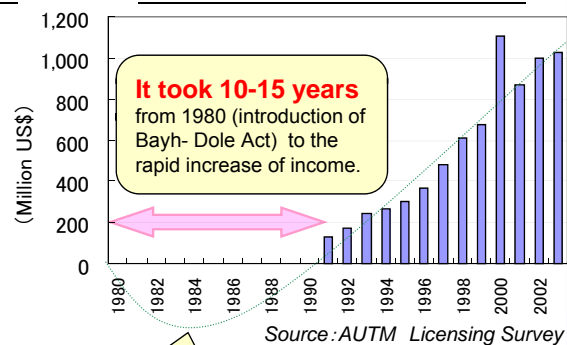
## Licensing activities in Japan and US (2)

**Breakdown of license income in Japan & US**



Source: UNITT (2008) and AUTM (2006) Licensing Survey

**Patent license income in US Univ.**



Source: AUTM Licensing Survey

Balance: Hockey stick curve

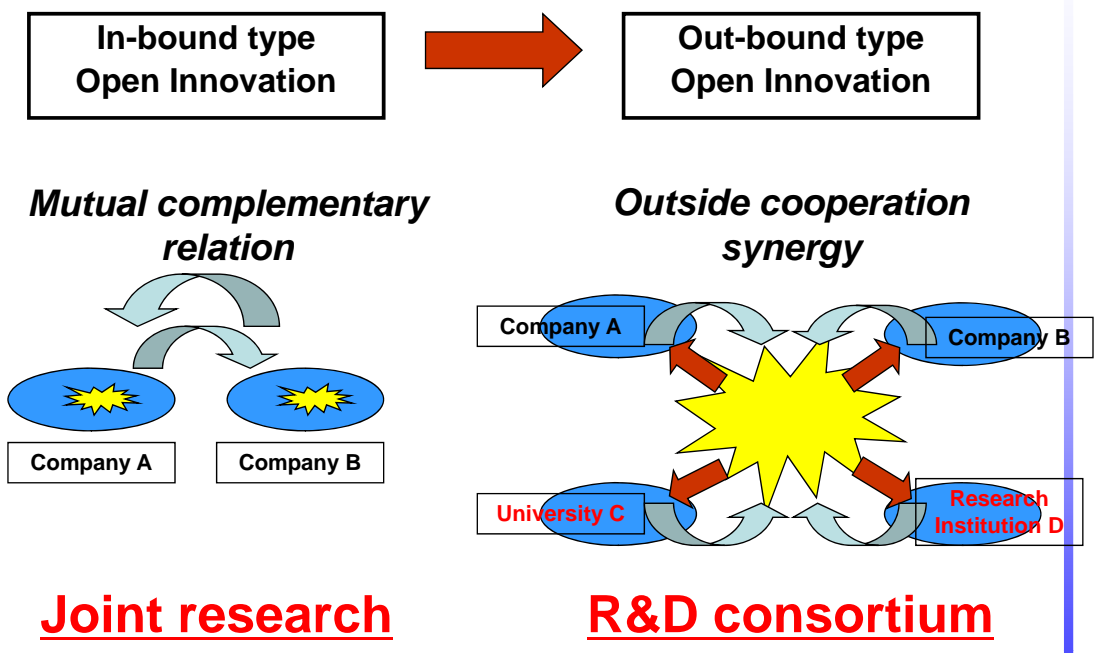
The number of **patent applications** from Univ./TLO in Japan has already reached the same level of the US level.

TLOs in Japan Established in '98

They should take IP strategy in consideration of commercialization more.

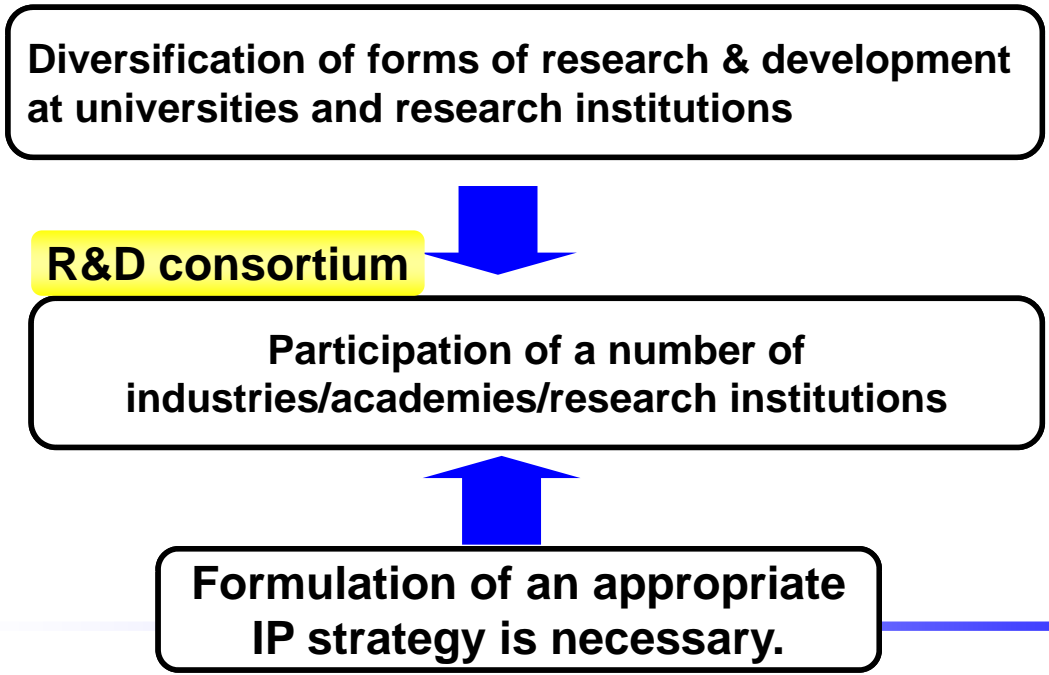
Just 10 years passed!

## Transition of Open Innovation – New Challenge



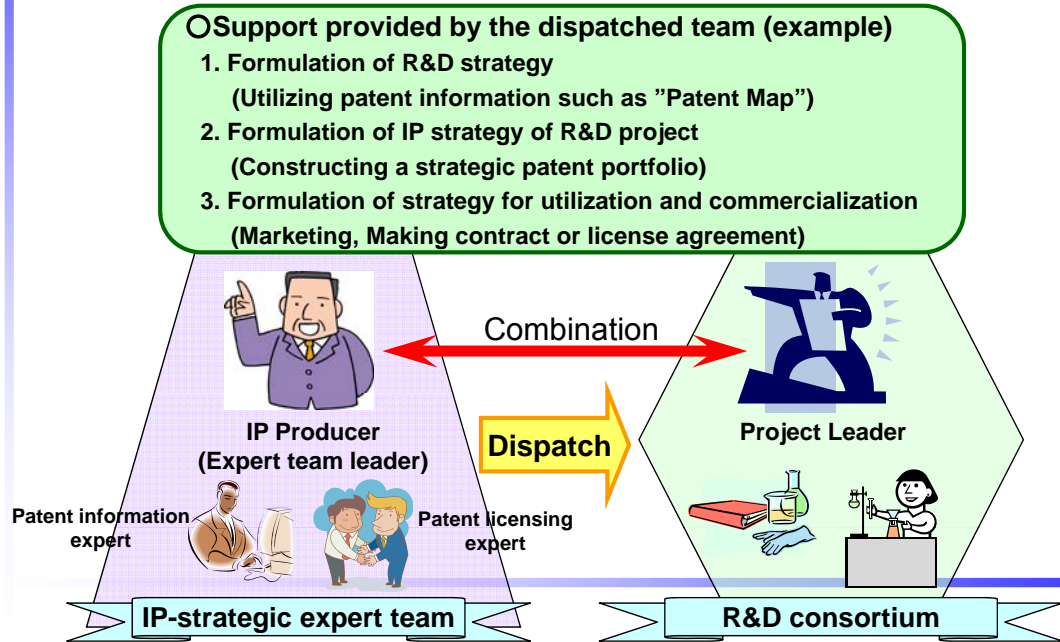
Source: Ministry of Economy, Trade and Industry (METI)

## Support for new cooperation between Academy & Industry — Diversification of forms of research & development —



## Dispatch of IP Producer

The JPO has just started to dispatch IP-strategic experts for a certain intensive period to an "R&D consortium" (Government funding project) in which multiple universities, research institutions and companies participate. The aim of this program is to support the formulation of strategies regarding IP, such as patent applications and commercialization, in the R&D consortium in order to promote R&D.



## Dispatch of IP Producer

### <Role of IP Producer in a R&D consortium>

before starting → early stage → middle stage → final stage

- |   |   |  |  |
|---|---|--|--|
| <ul style="list-style-type: none"> <li>• Consultation for a funding agency</li> <li>• Making R&amp;G strategy from IP view points</li> <li>• Formulating basic IP policy in terms &amp; conditions</li> </ul> | <ul style="list-style-type: none"> <li>• Formulating IP policy and letting researches know in the consortium</li> <li>• Supporting to make patent map</li> <li>• Educating and researchers</li> </ul> | <ul style="list-style-type: none"> <li>• Evaluation of research results</li> <li>• Consulting and Supporting to obtaining patents</li> <li>• Making patent portfolio</li> <li>• Advising R&amp;D strategy</li> </ul> | <ul style="list-style-type: none"> <li>• Making final patent portfolio &amp; attribution</li> <li>• Making policy for foreground IP</li> </ul> |
|---|---|--|--|

## Dispatch of IP Producer

### Requirements for IP Producer

- Knowledge Requirements
  - IP & related laws & regulations
  - Technology in the field
  - Business or Market trends
  - Management theory
  - ...
- Skill Requirements
  - Strategic planning
  - Marketing research
  - IP & Technology evaluation and management
  - Leadership
  - Communication
  - ...

### Keys for Success of IP Producer

- Ability
- Motivation } **Personal factors**
- Power
- Budget } **Organizational factors**

As of Dec. 2009,  
producers are sent to two projects  
as a trial.

#### Carrier of a producer:

- Master degree of Engineering
- Worked for a private company as researcher, IP manager & executive
- Worked for a university as IP adviser

## *In summary*

### In the movement toward "Open Innovation":

- Smooth flow of knowledge / technologies is key
  - IP plays more important role like currency
  - Universities / Research institutions are expected to involve in open-innovation model more
- R&D forms are diversified: e.g. research consortium
  - Clear objectives & exit strategy are needed
  - Formulation of an appropriate IP strategy is necessary
  - IP producer is a new key person
- Appropriate supports by the government are effective
- It takes time to have results from commercialization of university inventions

***Thank you***

***Japan Patent Office (JPO)***

***<http://www.jpo.go.jp>***