Importance of Technology Management
for
Universities and Public Research Institutions

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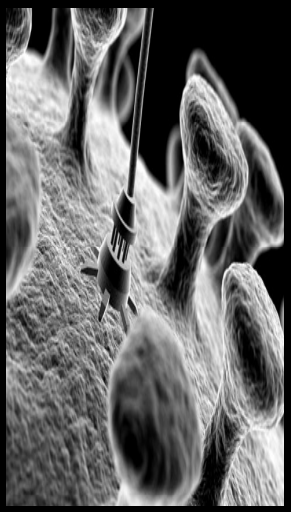
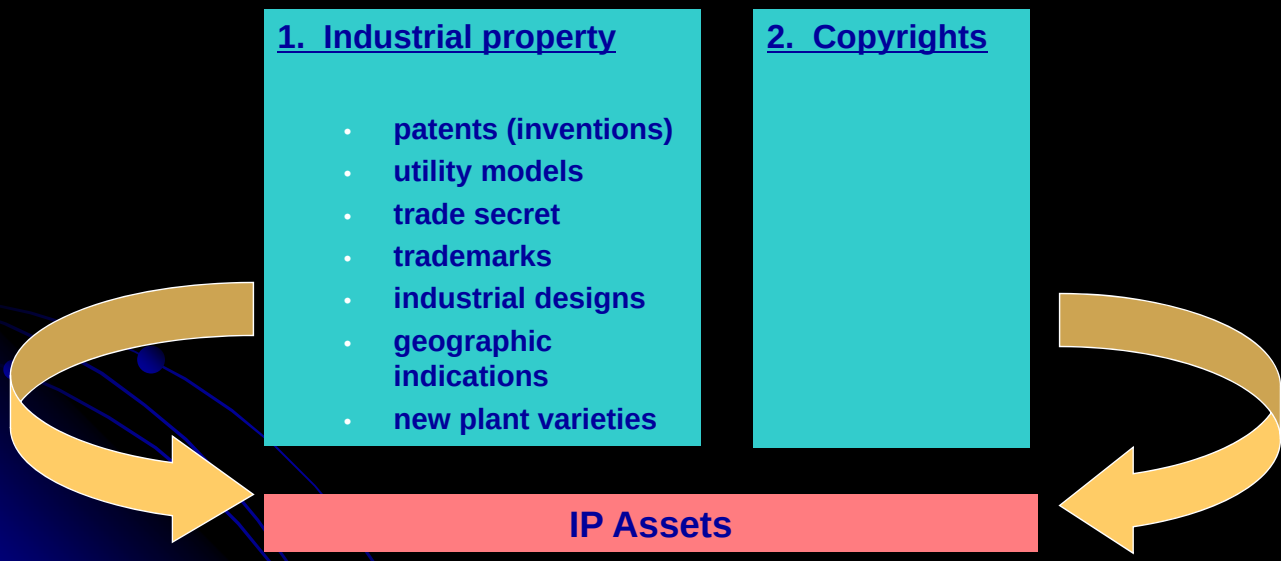
Outline

- IP Assets
- Innovation and Technology Transfer Trends
- University IP/Technology Management
- Institutional IP Policy



What Are IP Assets?

Creations of the mind:



International Law of IP

- Paris Convention
- Patent Cooperation Treaty (PCT)
- TRIPS Agreement
- Madrid Agreement (trademarks)
- Hague Agreement (industrial designs)
- Berne Convention (copyrights)
- WIPO Internet Treaties

Fortune 500 Companies

Over 80% of market value of Fortune 500 companies is based on their intangible assets

Intangible assets

(knowledge based assests)
e.g.
- **Patents**
- **Trademarks**
- **Brand**

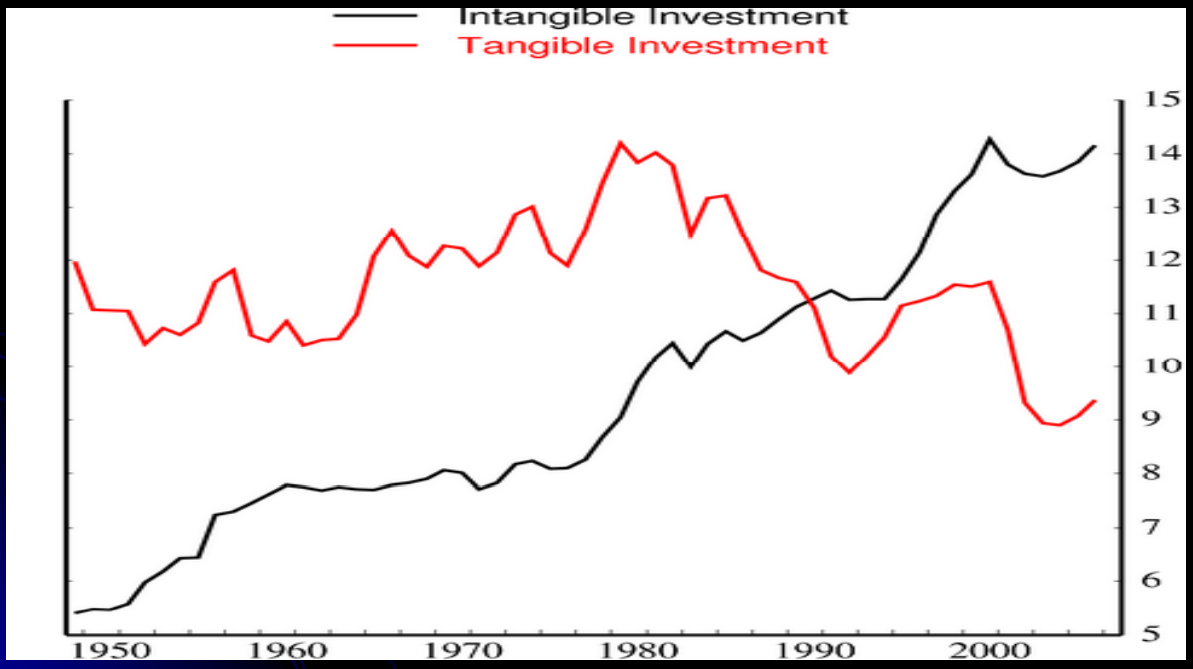
>

Tangible assets

(physical assests)
e.g.
- **Real estate**
- **Equippment**
- **Cash**

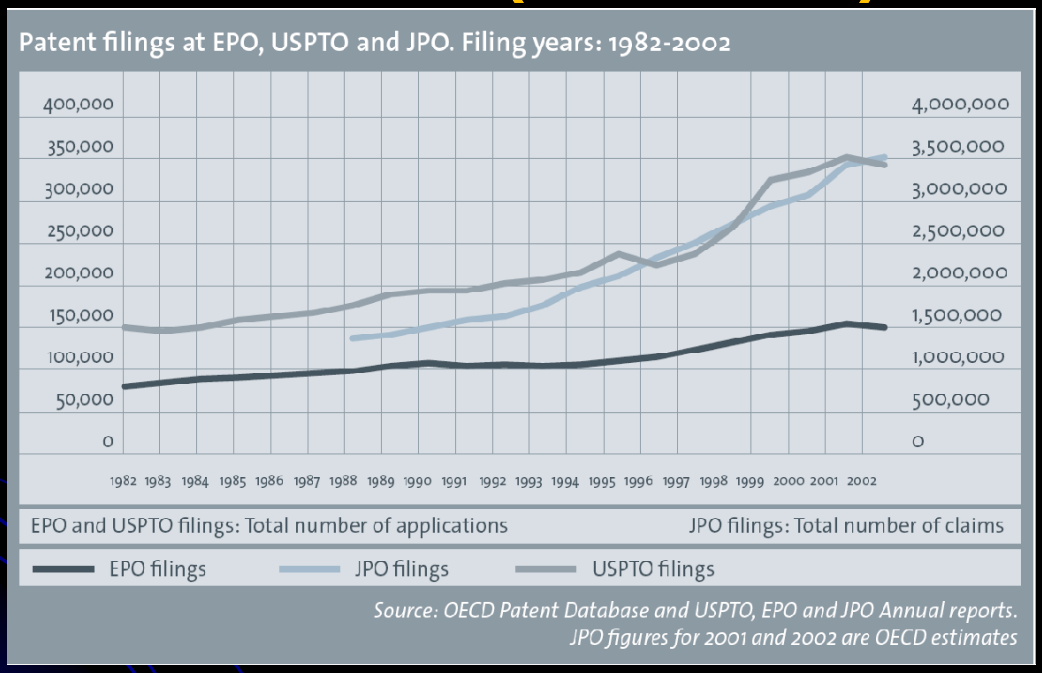
Business investment in the US: tangible vs. intangible investment

(% business output)



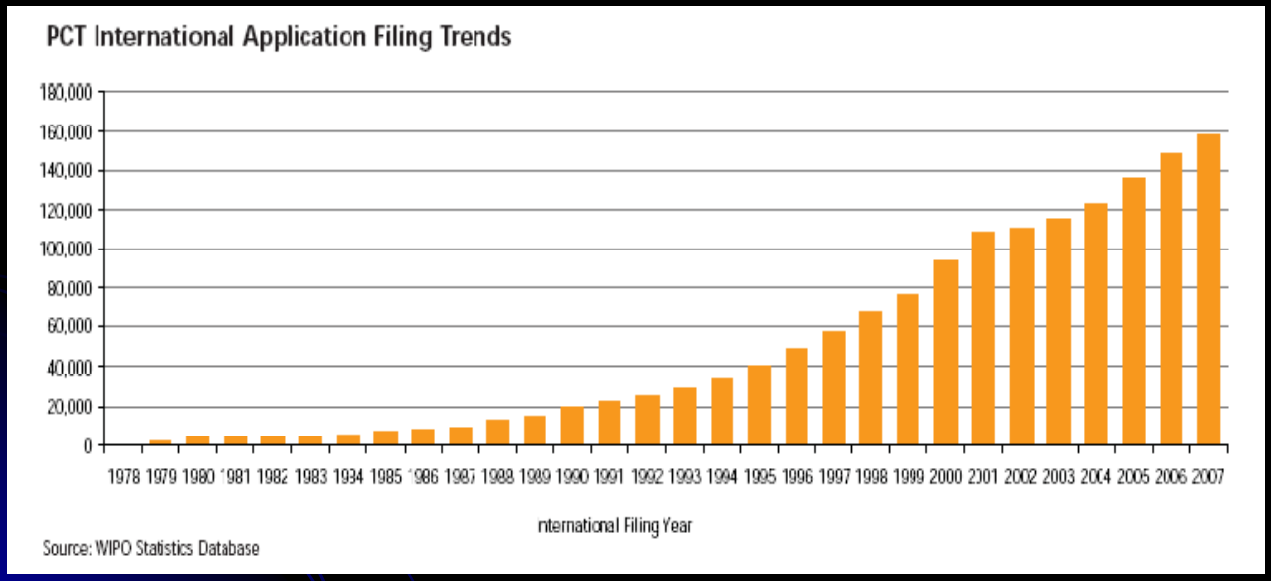
Source:Corrado,HultenandSichel(2005,2006)

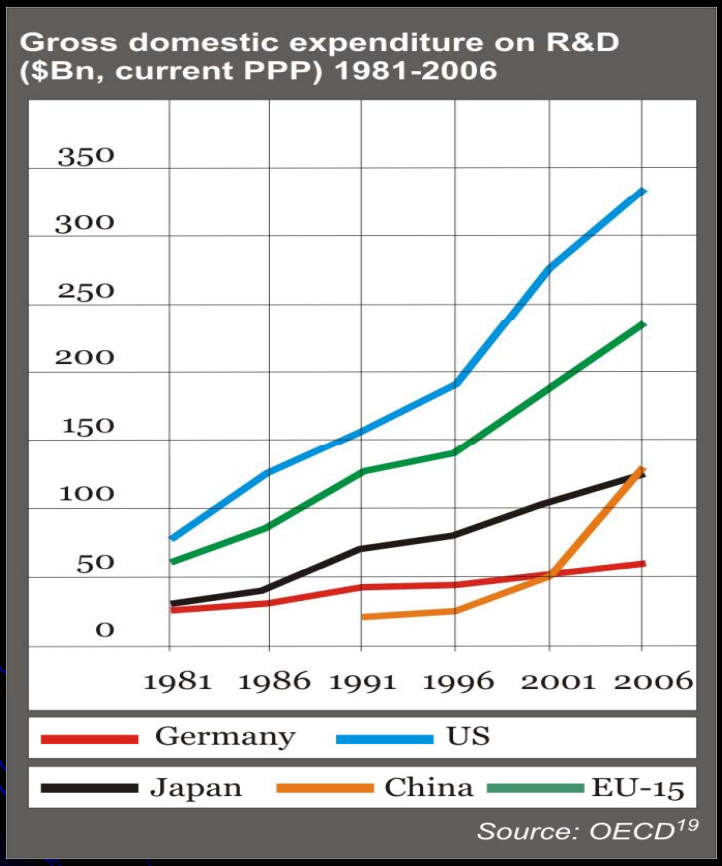
Patents filings at USPTO, JPO and EPO (1982 -2002)



1. EPO and USPTO filings correspond to total number of applications. JPO filings correspond to total number of claims (number
of claims per application multiplied by total number of applications) to account for the effect of the 1988 law reform allowing more than one claim per patent application at JPO.
Source: OECD Patent Database and USPTO, EPO and JPO Annual reports. JPO figures for 2001 and 2002 are OECD estimates.

PCT Applications





EPO Scenario for the Future, 2007

Innovation and Economic Growth

The creativity and inventiveness of our people is our country's greatest asset and has always underpinned the UK's economic success.

But in an increasingly global world, our ability to invent, design and manufacture the goods and services that people want is more vital to our future prosperity than ever.

Innovation, the exploitation of new ideas, is absolutely essential to safeguard and deliver high-quality jobs, successful businesses, better products and services for our consumers, and new, more environmentally friendly processes.

Rt. Hon. Tony Blair, Prime Minister

Innovation Report 2003

Economic Benefits of IP

Macroeconomic level

- Increase GDP and competitiveness
- Enhance exports of high value
- Stimulate R&D
- Reduce brain drain by providing incentives
- Help address national human capital needs
- Develop national brand and cultural identity
- Attract beneficial FDI and local investment
- Job creation

Economic Benefits of IP

Microeconomic level

- Create portfolios of IP as a source of competitive advantage
- Enhance products and promote brand value
- Enhance corporate value
- Avoid and defend against litigation
- Provide incentives and recognition

Patent

- **A right granted by a state to an inventor, to exclude others from making, using, selling or importing in the territory without the inventor's consent**
- **In exchange for a disclosure of specification of the invention**
- **Limited period, 20 years in many countries**
- **Territorial**

Why are Patents necessary?

Patents provide **incentives** to individuals by offering them **recognition** for their **creativity** and **material reward** for their marketable inventions. These incentives encourage **innovation,** which assures that the **quality of human life** is continuously enhanced.

IP Divide...

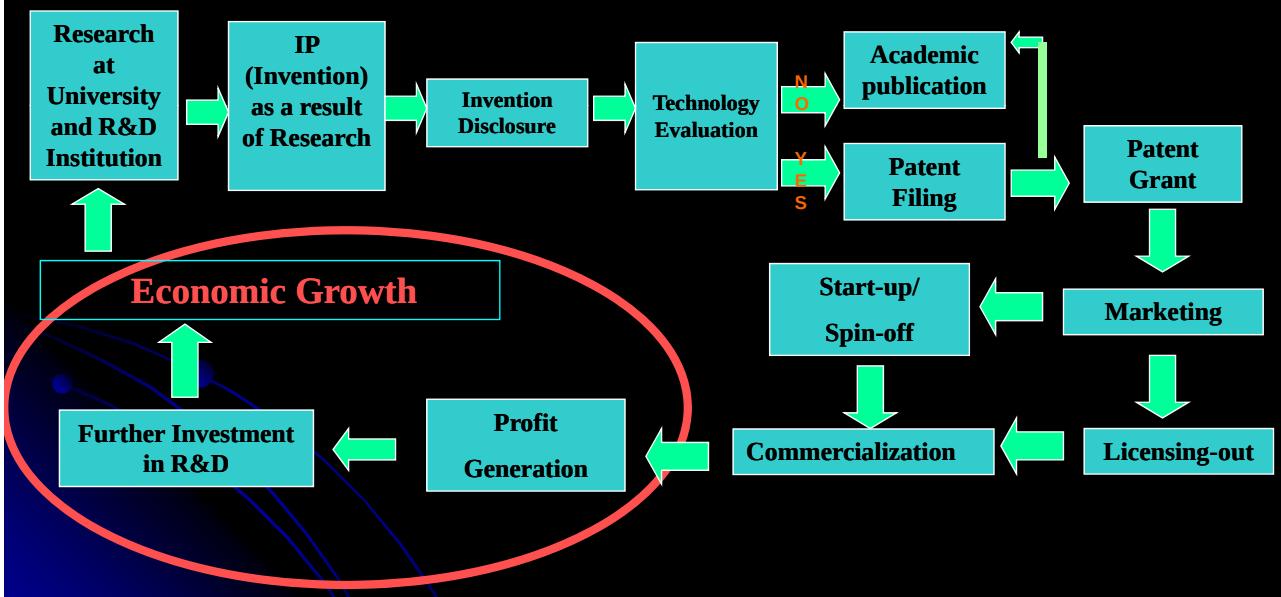
- 91% of patents are from OECD countries, >85% from EU, Japan and US
- PCT filings and national patent filings in developing countries are by non-residents primarily

National IP Strategy

National IP Strategy should be established in line with the legal, economic, educational and R&D policies of the nation, such as:

- Legal system
- Economic and Industry Infrastructure
- Science, Technology, and Innovation (R&D Strategy)
- Financial System
- Trade policy
- Culture and Education
- Infrastructure

Innovation and Economic Growth Cycle



Technology Transfer

…..the process of transferring scientific research results, technical expertise or know-how developed by an individual, enterprise, university or organization to another individual, enterprise, university or organization.

…..Effective technology transfer results in commercialization of a new product or service….

Growing Technology Transfer Activities from University

Example: US in 2007

- **$ 48.8 billion R&D expenditures**
- **5,109 new licenses**
- **13,600 current valid licenses from Universities to Companies**
- **686 new products introduced into the market**
- **3,622 patents from univ. issued**
- **4,350 new products in last 8 years**
- **555 new start-ups**
- **6,279 new spinouts since 1980**

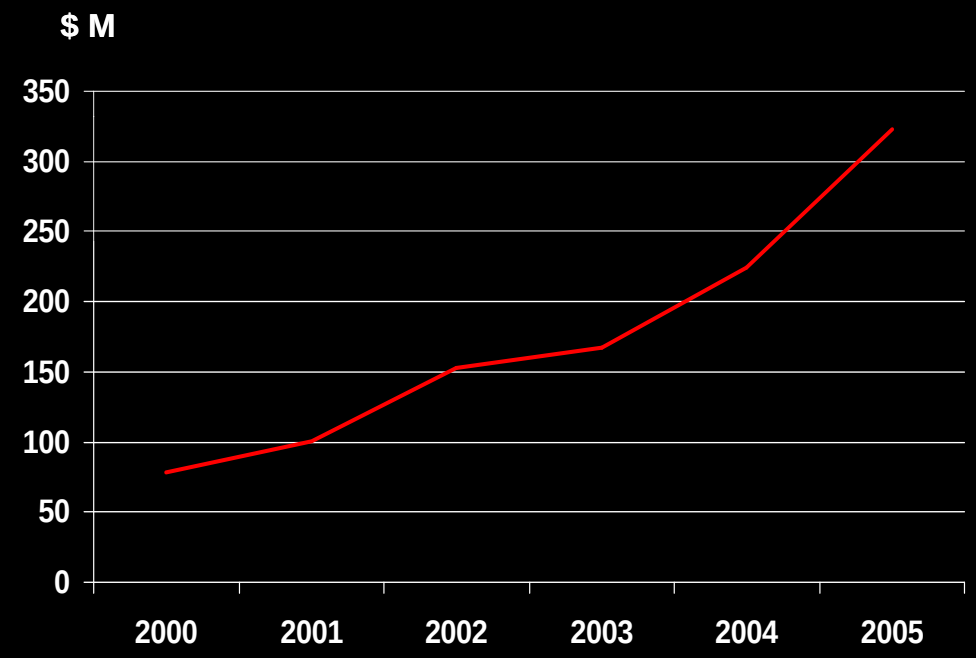
Source: AUTM

Globalization of R&D

Increased partnerships beyond national frontiers:

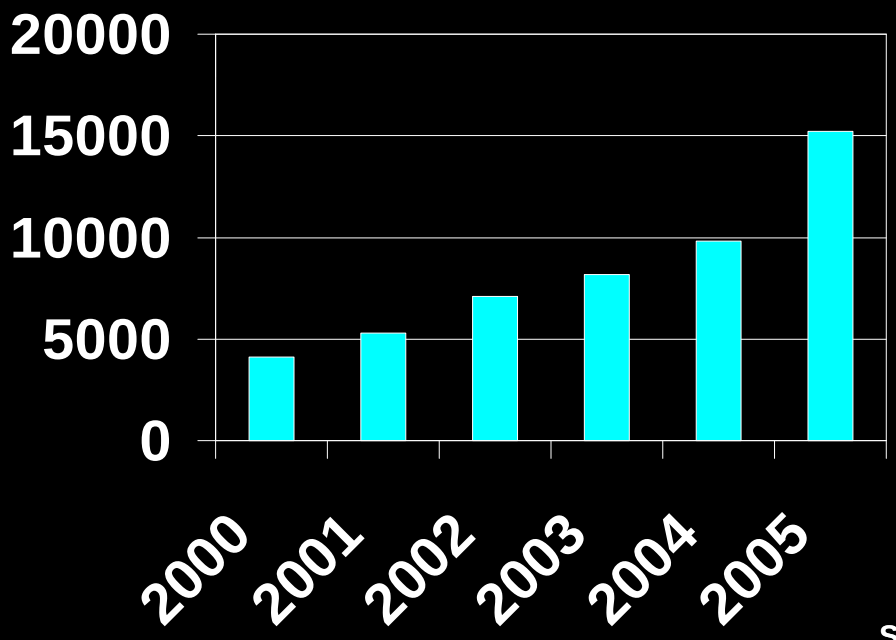
- **Nokia + University of Cambridge (Nanoelectronics)**
- **Microsoft + Inria: French computer science institution (IT)**
- **Hewlet-Parckard = IT Laboratory in San Petersburg**
- **Creation of European Institute of Technology (a research network without a localized headquarter) by the European Commission: €3.2b 2008 - 2013**

Investment in University Research



Source: Nikkei

University-Industry Joint Research



Source: Nikkei

Industry Strategies

R&D Budget Increase

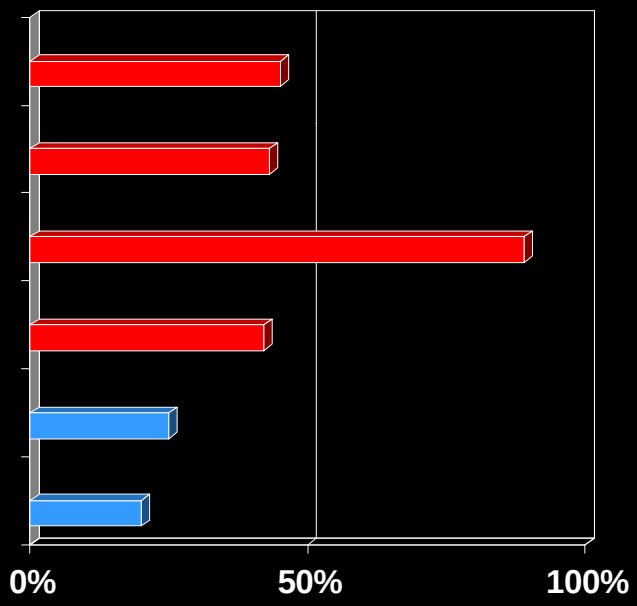
R&D Staff Increase

Joint R&D with JP Univ.

Joint R&D with Overseas Univ.

Joint Venture

Others



Source: Nikkei 2005

Change in Legal Framework

US - Bayh Dole Act (1980)

The Bayh-Dole Act allows the transfer of *exclusive* control over inventions generated from government funded researches to universities

Abolition of the Professor's privilege

Germany: 2001 Reform of Employee Law
Austria: 2002
Denmark: 2002 Act on Inventions at Public Research Institutions

University Law

Japan:
1995 Basic Law of Science and Technology
1998 Law promoting tech. transfer from universities
1999 Japanese version of Bayh Dole Act
2000 Law facilitating univ.-industry collaboration
2004 Change in legal status of public universities (semi-autonomous institutions)

New Innovation Concept: Open Innovation

This new approach is based on a different knowledge lanscape, with a different logic about the sources and uses of ideas. Open Innovation mean that valuable ideas can come from inside or outside the company and can go to market from inside or outside the company as well.

This approach places external ideas and external paths to market on the same level of importance as that reserved for internal ideas and paths to market during the Closed Innovation era. (Chesbrough, Henry, Open Innovation, 2003)

Open Innovation

Open innovation is described as:

“combining internal and external ideas as well as internal and external paths to market to advance the development of new technologies”

Source: Chesbrough, Henry, Open Innovation, 2003

Change in Merck's approach

Merck is a Company commited to significant internal scientific research, but its 2000 annual report noted that:

"Merck accounts for about 1 % of the biomedical research in the world. To tap into the remaining 99 %, we must actively reach out to universities, research institutions and companies worldwide to bring the best of technology and potential products into Merck"

(Chesbrough, Henry, Open Innovation, 2003)

Open Innovation Models:

- **Lilly**
- **DuPont**
- **Apple**
- **Novartis**
- **IBM**
- **P&G**

These companies have realized the power of admitting that not all good ideas start at home. Making network innovation work involves cultivating contacts with start-ups and academic researchers, constantly scouting for new ideas and ensuring that engineers do not fall prey to "not invented here" syndrome, which always values in-house ideas over those from outside.

(The Economist, Lessons from Apple. 09/06/2007)

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Implications of New Innovation Trends

Universities and research organizations

- **Increased opportunities to participate in business as providers of new technologies**
- **Need to develop skills to protect and commercialize their IP assets with close collaboration with private sectors**
- **Need to have IP Policy and guidelines to effectively manage IP/technology and collaborate with private sectors**

Government

- **Create legal framework/ infrastructure and provide funds that facilitate PPP**

SMEs

- **Need to increase their IP portifolio in order to compete**
- **Need to collabrate with other enterprises**

Multinationals

- **Increasingly consider business models which include the development of knowledge outside their headquarters**
- **Obtaining ideas and technologies outside organization**
- **Develop and integrate local capabilities.**

University Roles

In the past….

- Education
- Generate new knowledge through research
- Transfer the knowledge generated to the public for the benefit of society

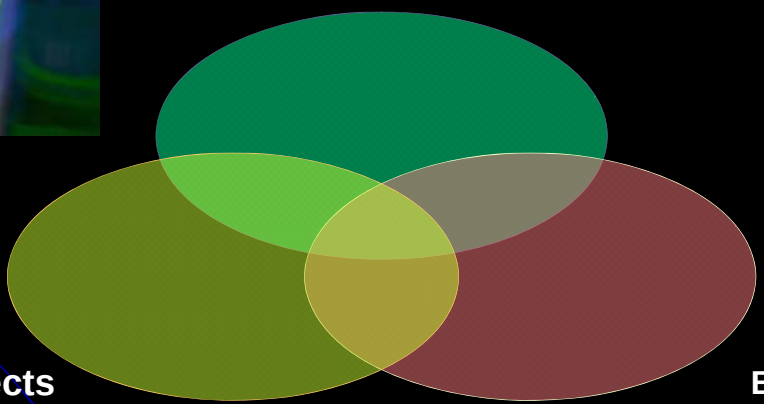
Today, additional roles of universities

- Financial support for research
- Protection of research results
- Commercialization of research results
- Increased collaboration with industry
- Entrepreneurship development
- Incubation of Spin-off/ Start-up
- Monitoring the processes (Patent, Licensing, TT)

IP &Tech. Mgt.

IP and Technology Management

Technology Management



Legal aspects

Business

University and IP rights

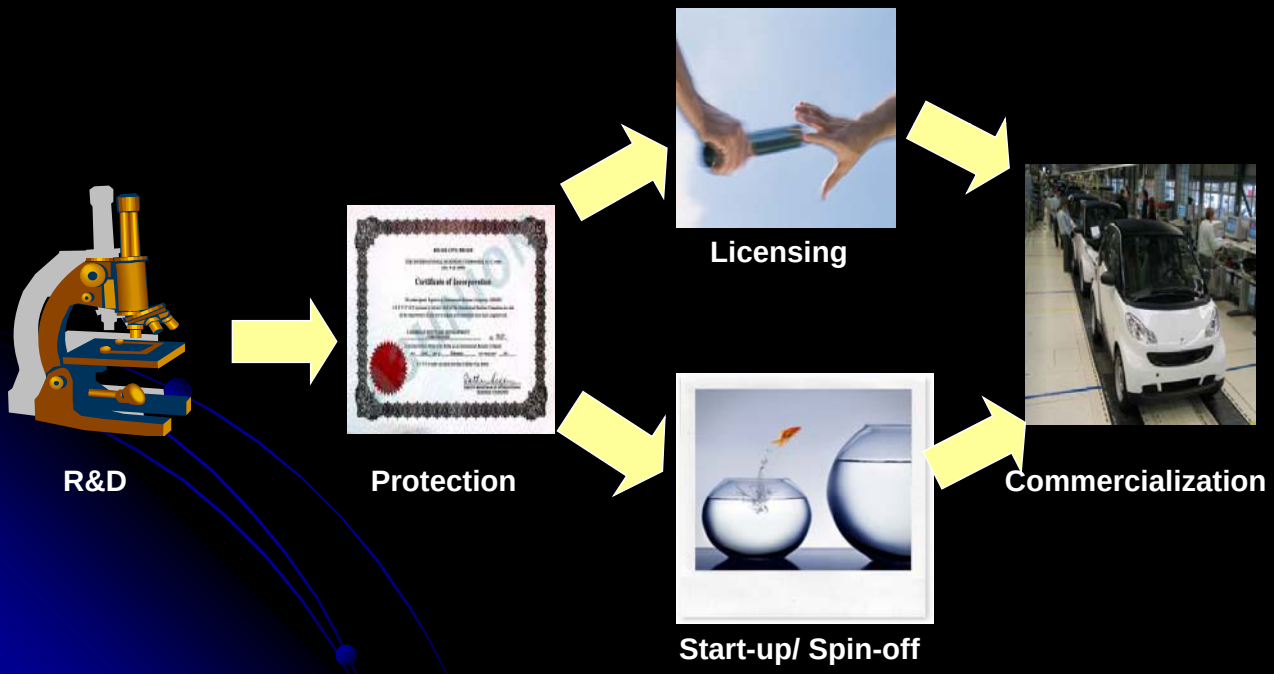
Universities should identify, protect, manage, utilize and profit from IP rights in the fields of :

- Patents
- Copyrights
- Computer programs
- New biological materials
- Trade secrets
- Designs
- Trademarks

Stakeholders

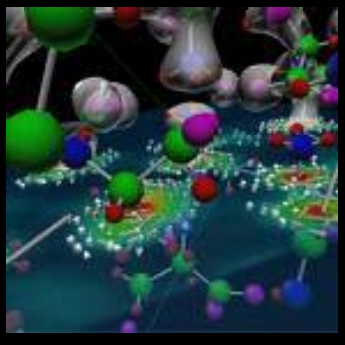
- **All university/ RI staff**
  - **University and RI**
  - **The managers of University and RI**
  - **Professors and researchers**
  - **Research assistants, post graduate students and visiting researchers**
- **Research collaborators and private sponsors**
- **Partner universities**
- **TTO and IP management unit within the university**
- **Commercialization partners - Industry**
- **The national and local Governments**
- **The public**

From Research to Commercialization



IP Management in Universities

1. **Infrastructure**
   - Establishment of a TTO
   - Development and administration of IP Policy
2. **Research**
   - R&D planning/strategy
   - Research funding management
   - Research collaborations
3. **Protection of IPR**
   - Identification of IP
   - Invention disclosure
   - Evaluation of IP
   - Patent application procedures
   - Patent Information (Prior art) search
   - Legal matters
   - Administration of legal issues
4. **Exploitation of IPR**
   - Marketing of new technology
   - Marketing potential licensees
   - Licensing negotiation and monitoring deals
   - Technology valuation
   - Commercialization
   - Incubation
5. **Capacity Building**
   - IP training



Necessary Ingredients

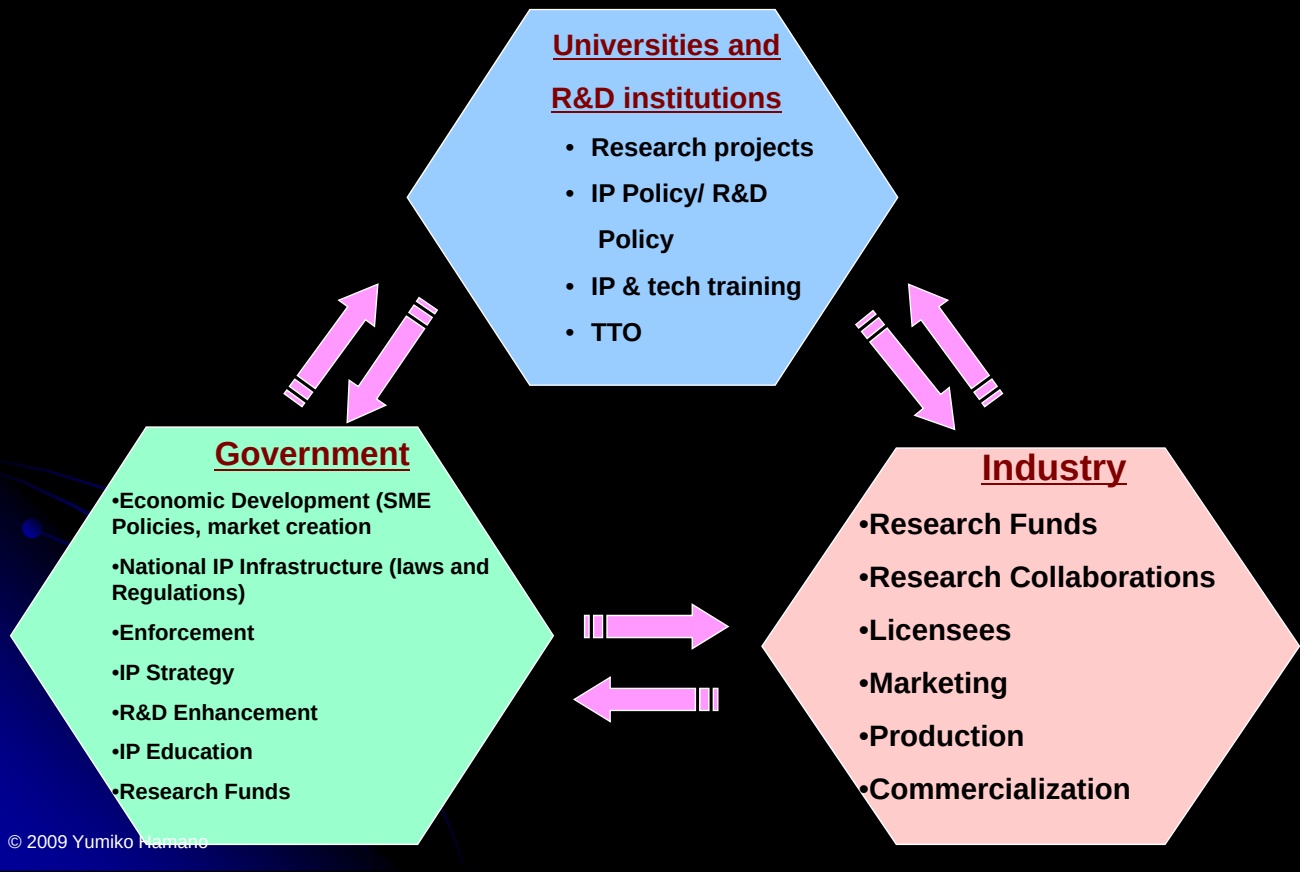
Marketable Technologies

Funds

Infrastructure

HR with right skills

Public-Private-Partnership (PPP)



Institutional IP Policy

IP Policy:

Principles of actions adopted by an organization or an individual – often legal implication

Importance of IP Policy

IP Policy provides:

- Clear rules and guidelines for research operations
- The legal framework for commercialization
- Guidance for IP and technology management procedures
- Clear policy on ownership criteria and benefit sharing
- Consistency of approach (in a systematic manner)
- Transparency in decision making process
- Objectivity in measurement

and fosters:

- Transfer of technology generated in the university
- Innovation and creativity in the university
- (Local) economic growth

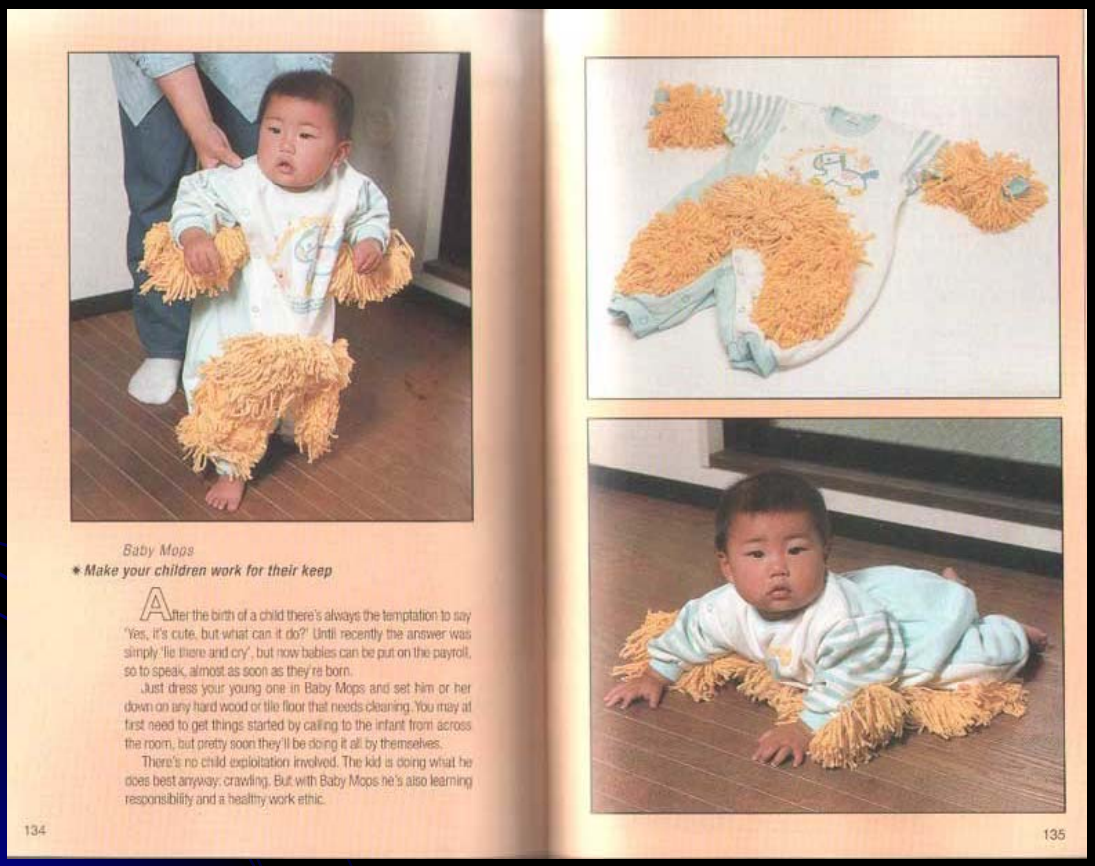
Privately Funded Research

To encourage privately funded research, the institutional IP policy should provide clear provisions on:

- **Approval procedures for privately sponsored research proposals**
- **Ownership of IP generated from privately sponsored projects**
- **Licensing of IP generated from privately sponsored projects**
- **Confidentiality issues of privately sponsored projects**

Major Challenges to commercialize R&D results

- **Lack of IP management infrastructure**
- **Lack of strategic research planning**
- **Gap between basic research and market needs**
- **Lack of funds for IP protection**
- **Lack of IP knowledge**
- **Lack of expertise to manage TT and commercialization process**
- **Lack of entrepreneurial skills**
- **Lack of support (Government, University senior managers) and incentive**
- **Conflict of interest (University vs. Industry)**



Baby Mops

Make your children work for their keep

After the birth of a child there's always the temptation to say 'Yes, it's cute, but what can it do?' Until recently the answer was simply 'lie there and cry', but now babies can be put on the payroll, so to speak, almost as soon as they're born.

Just dress your young one in Baby Mops and set him or her down on any hard wood or tile floor that needs cleaning. You may at first need to get things started by calling to the infant from across the room, but pretty soon they'll be doing it all by themselves.

There's no child exploitation involved. The kid is doing what he does best anyway: crawling. But with Baby Mops he's also learning responsibility and a healthy work ethic.

134

135

Thank you for your attention.

Image source: Google

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www.wipo.int

WIPO University Initiative web site:

www.wipo.int/uipc/en

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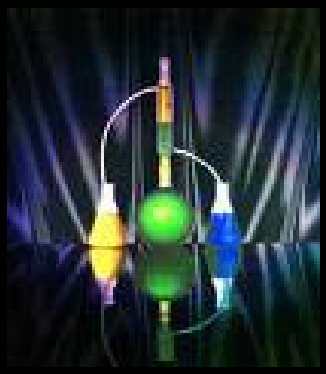

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