Tech Transfer: Challenges and Issues for SMEs

Submitted by: WIPO
Tech Transfer: Challenges and Issues for SMEs

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WIPO’s Activities for SMEs

- Promote a more active and effective use of the IPR system by SMEs
- Strengthen the capacity of national governments to develop strategies, policies and programs to meet the intellectual property needs of SMEs
- Improve the capacity of relevant public, private and civil society institutions, such as business and industry associations, to provide IP-related services to SMEs
- Provide comprehensive web-based information and basic advice on IP issues to SMEs support institutions worldwide
Some Recent Studies of Interest

- Benchmarking National and Regional Support Services for SMEs on IPRs (EU27+); 2007
- Support Services in the Field of IPRs for SMEs in Switzerland; A Review; 2008
- Technology Transfer, IP and Effective University-Industry Partnerships: The Experience of China, India, Japan, Philippines, Republic of Korea, Singapore and Thailand; 2005

Dynamic Interactions between Research, Innovation & Enterprise

- R&D / IP Creation
- Innovation / Technology Commercialization
- New Venture Creation
- New Products from Existing Firms
- Technology Utilization / Diffusion
Dynamic Interactions among R, I and E

- Rapid diffusion & effective exploitation of existing S&T are important for Enterprises in early stages of industrial development, while capacity to create own IP become more critical in later stages.
- High R&D investment need not lead to high innovation (defined as commercial exploitation of the knowledge/IP created through R&D).
- Innovation pattern drives enterprise dynamism, which in turn influences the intensities and nature of future R&D and innovation pattern.
- Access to global technologies and talents can complement indigenous capability development.
- Two related perspectives on dynamic interactions:
  - National Innovation System perspective
  - Enterprise Ecosystem perspective

Need for a Holistic Approach

- Sustainable R&D funding
- Long term R&D strategies
- Professional R&D management
- Proactive communication efforts
- Technology transfer strategies
- Regional development in general
- Market development
- Tax, immigration and property rights laws
University Teaching is Key

What’s most important: Graduates are the most important output of universities and thus their most important contribution to technology transfer. Therefore, university teaching is key – also for the economic development of a country and its regions.

Best faculty: If university teaching is key – hiring the best faculty is even more important.

Entrepreneurship: Start-ups initiated by university graduates are more important for the economic tissue of a region than spin-offs of a university. Therefore, fostering entrepreneurship has to be part of standard curricula.

Including Technology Transfer in R&D

Explicit and comprehensive: Universities and research institutes should develop explicit technology transfer strategies. Moreover, technology transfer has to be part of an overall R&D management.

Basic and applied science: One of the best ways to be successful in technology transfer is to link basic and applied science.

Technology transfer is a give and take! Integrating business partners and their specific needs already in the design of research projects facilitates the transfer of innovation.
Demand Driven – Innovation Driven!

- **More than improvements**: Demand driven R&D mostly improves existing technologies or processes. Innovation driven technology transfer has to be enhanced as well in order to achieve real innovation.
- **Seed money**: Public money will be needed to support innovation driven technology transfer and proof of concept projects.
- **Matching responsibilities**: Industrial partners should contribute financially. Matching funds are the most successful way to foster innovation driven technology transfer.

Specific Challenge: Addressing SME

- **Sustainable economic development**: SME are key for a sustainable economic tissue of a region. Special attention therefore, has to be given to integrating SME in R&D networks.
- **Special care**: SME usually don’t have the resources to tackle more than their daily business. Moreover, they don’t have ties to the scientific community. Knowing their specific needs and offering concrete services therefore is decisive for successfully addressing SME.
Technology Transfer: Some Best Practices

- Regular, institutionalized contacts of universities and industrial partners can build up mutual understanding.
- Specific clubs of regional companies as “group of friends of the university” seem to be promising.
- Joint projects of research institutes and industrial partners
- Internships in the industry as part of standard university curricula
- Industrial partners lecturing at the universities
- Sabbaticals of university professors in the industry

Common situation in SMEs performance and innovation management capacity:

- Can an average entrepreneur be sure about managing the business with high efficiency, min losses? **NO!**
- Does he/she use some dedicated IT tools to measure business results and simulate major decisions? **NO!**
- Can innovation, technology transfer and globalization threats be managed effectively in such a case? **NO!**
What are New Technology Based Institutional Forms (NTIFs)?

- Technopoles
- Technology parks
- Science/research parks
- Science cities
- Centers of excellence
- Technology incubators
- Innovation centers
- …

Technology Parks

Roles

- Technological support to SMEs
- Business linkages
- Counseling services (financial, administrative, technical, legal, …)
- Technology transfer
- Local development: catalyst for enterprises
Technology incubators

Roles

- Overall economic development
- Development of entrepreneurial culture
- Promotion of SME productivity and competitiveness
- Transforming research results to products and services
- Dissemination of technical skills
- Strengthening public-private cooperation and effective utilization of capital

Paisley Innovation & Knowledge Transfer (PIKT)

A Scottish Executive SEEKIT Project

- **Objective**
  - Use the University knowledge and skill base to help SMEs overcome technical & change management challenges.

- **PIKT provides 3 key components of business support.**
  - **Awareness**
    - Seminars, workshops, visits, advice.
  - **Assessment**
    - On-site experts to help define your key technology challenges and how to tackle them.
  - **Access**
    - University experts & funding to meet you business objectives.
PIKT Project
-Benefits

To the SME
- Gain new technical knowledge.
- Get help with development of new products.
- Access high-tech equipment.
- Access joint funds.

To the University
- Generate and improve links between the University of Paisley and local SMEs.
- Improve commercial awareness of University staff.
- Develop future collaboration routes.

Promotion of Technology Transfer and Patent Licensing - for SMEs -

NCIPI: National Center for Industrial Property Information and Training
**What is NCIPI?**

- NCIPI is an independent national administrative agency (Government agency).
- Established in April 2001 (Separated from the Japan Patent Office)
- Extended operations in October 2004
- 79 staff members

**Mission of NCIPI**

- Industrial Property Gazettes Library
- Consultation on industrial property system
- Training both for JPO staff and general public
- Dissemination of patent information (IPDL, etc.)
- Promotion of technology transfer and patent licensing
Background of NCIPI Measures for Promoting Technology-Transfer & Patent Licensing

**Need for Tech-Transfer**

<table>
<thead>
<tr>
<th>Large-scale Enterprises</th>
<th>SMEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES (90.5%)</td>
<td>YES (80.0%)</td>
</tr>
</tbody>
</table>

**Tech-Transfer Experience**

<table>
<thead>
<tr>
<th>Large-scale Enterprises</th>
<th>SMEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES (88.7%)</td>
<td>YES (27.5%)</td>
</tr>
</tbody>
</table>

**Obstacles to Technology Transfer**

<table>
<thead>
<tr>
<th>Obstacle</th>
<th>Large-scale Enterprises</th>
<th>SMEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Difficulty</td>
<td>16.7%</td>
<td>43.0%</td>
</tr>
<tr>
<td>Lack of Knowledge to Conduct Tech-Transfer</td>
<td>11.3%</td>
<td>41.3%</td>
</tr>
<tr>
<td>Lack of Information on Tech-Transfer</td>
<td>11.3%</td>
<td>31.8%</td>
</tr>
<tr>
<td>Lack of Experts in Patent Licensing</td>
<td>27.4%</td>
<td>46.4%</td>
</tr>
</tbody>
</table>

(Source: NCIPI Questionnaire Survey in 2000)
**Promotion of Tech-Transfer (1)**

--- Patent Licensing Advisor ---

- Official specialists in technology transfer
- Dispatched 110 advisors to prefectural governments and TLOs (October 2004)
- Nationwide network of advisors
- Visit companies, universities and research institutes
- Collect technological needs and licensable technological seeds
- Make a match of them

**Promotion of Tech-Transfer (2)**

-- Construction of Patent Licensing Database --

- Retrieve licensable patents of companies, universities and research institutes on the Internet.
- About 55,000 licensable patents (At the end of October, 2004)
- Free-of-charge

Patent Licensing Database

Registering licensable patent information into the Database and Offering it on the Internet

**Parties who want to disclose licensable patents**
Companies, universities and research institutes that want to license patented technologies

**Patent Licensing DB**
- patent licensing information
- information on demands for technologies

**Parties seeking licensable patents**
Companies which want to use licensable patents

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Patent Licensing DB’s Search Screen

New functions added to the Patent Licensing DB

- Introducing your licensable patent on your Website (Virtual DB function)
- Developing own Patent Licensing DB not necessary (Your website directly connected to the Patent Licensing DB)
- NCIPRI invites applications to register and place licensable patents on the DB
Promotion of Tech-Transfer (3)
-- Charts for Supporting Patent Licensing --
(Patent Maps)

• Numerous technical themes available for small and medium-sized enterprises.
• Analyze patent information and identify trends.
• Introduce company patent information.
• Based on 2000-3000 patents applied for in the past 10 years.
• Analyzed by experts on each technical theme.
• High quality
  <Only Japanese patents are available due to budget constraints.>

Technical Themes in 2003

<table>
<thead>
<tr>
<th>Electricity</th>
<th>Technical Theme</th>
<th>Chemistry</th>
<th>Technical Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Networked Electrical Appliances</td>
<td>14</td>
<td>Light Metal Complex Material</td>
</tr>
<tr>
<td>18</td>
<td>Recognition of 3D Objects</td>
<td>15</td>
<td>Machines Using Ferments</td>
</tr>
<tr>
<td>19</td>
<td>LED for Lighting Facilities</td>
<td>16</td>
<td>Biomass Energy</td>
</tr>
<tr>
<td>20</td>
<td>Remote Medical &amp; Nursing System</td>
<td>17</td>
<td>Treatment and Use of Garbage</td>
</tr>
<tr>
<td>21</td>
<td>Sound Compression Technique</td>
<td>18</td>
<td>Syntheses of Solid Membrane on Metal Surface</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Machinery</th>
<th>Technical Theme</th>
<th>Chemistry</th>
<th>Technical Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Networked Industrial System</td>
<td>20</td>
<td>Magnesium Alloy</td>
</tr>
<tr>
<td>10</td>
<td>Cogeneration System</td>
<td>21</td>
<td>Improvement of Soil</td>
</tr>
<tr>
<td>11</td>
<td>Nursing Bath Machine</td>
<td>19</td>
<td>Use of Kichin &amp; Kitosan</td>
</tr>
</tbody>
</table>

| 12 | Easily-Removable Fixation System | 10 | Barrier-free Houses |
|    |                                  | 11 | Minus Ions Producers |
|    |                                  | 12 | Mass Analyses       |
|    |                                  | 13 | Snow Melting Technique |

We have managed 67 themes since 2001!!
Example of Matrix Analysis in the Charts  
(Ex. Technique of the Treatment of Water Using Adsorption)

We show the number of applications in a figure with bubbles.

Promotion of Tech-Transfer (4)

---- Patent Information Advisor ----

• Advises and gives lectures on searching and utilizing patent information

• Answers any questions concerning how to use the Industrial Property Digital Library (IPDL) and other patent information services
  (IPDL: http://www.ipdl.ncipi.go.jp/homepg_e.ipdl)

• Conducting search demonstrations
### Patent Information Advisor Dispatch Service

#### What is a Patent Information Advisor?
- 46 Advisors are now dispatched to prefectural governments throughout Japan.
- Search advising services are provided as a part of prefectural programs.
- Advice provided on how to use the IPDL and other patent information services and on how to utilize patent information.
- Instruction geared for each level, from basic to high level.

#### Tasks of a Patent Information Advisor
- Providing consultation services as resident advisors at the office
- Providing consultation services via the IPDL’s private lines
- Providing on-site consultation and advice
- Providing in-house training services to companies
- Providing lectures at seminars of prefectural governments
- Periodical instruction

### Promotion of Tech-Transfer (5)

---Patent Licensing Business Information---

#### Service on Patent Licensing Agents (Patent Licensing Agents Database)
- Gathers information submitted by agents who carry out patent licensing business.
- Information about licensing agent operations provided.
- Available via the Internet for anyone to access.
Number of Patent Licensing Agents Registered in NCIPI Website

Promotion of Tech-Transfer
--- Other Services ---

1) Providing examples of licensable patent utilization on NCIPI website
2) Seminars for encouraging patent licensing (international and domestic)
3) Training programs for fostering patent licensing agents
Results of Patent Licensing Advisor’s Activities

Graph showing the number of contracts per fiscal year from 1997 to 2003.

Graph showing the total economic impact and employment created from 1997 to 2003.
Example A
--From Large Company to Distant SME--

1) President of small press making company happens to find some hints in drawings from his customer.

2) The key technology was patented to a major automobile company in Hiroshima prefecture.

Example A
--From Large Company to Distant SME--

3) The president consults a patent licensing advisor in Chiba prefecture.

4) The advisor soon makes contact with another advisor who works where the automobile company is located.
Example A
--From Large Company to Distant SME--

5) Two advisors join together to license the patent from the automobile company to the small press company. → Finally, the patent is successfully licensed.

NOTE:
Patent Licensing Advisors
- Nationwide network
- Trusted by both large and small companies

Example B
--From University to SME--

1) A small company comes to know of new microscopic technology at a university in Kyoto and contacts the TLO of the university.

2) The patent licensing advisor of the TLO gives detailed information to the company and coordinates discussion between the inventor and the company.
Example B
--From University to SME--

3) Then the patent licensing advisor arranges the evaluation of a trial piece.

4) Finally, the company decides to license the technology after the evaluation.

NOTE:
Patent Licensing Advisors
- Dispatched to many university TLOs
- Coordinate various matters for technology transfer

NCIPI
URL: http://www.ncipi.go.jp/english

Thank you for your attention!