

University – Industry Collaboration to Promote Technology Transfer
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Opportunities and Challenges for Open Innovation

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Outlines

- An overview of open innovation
- Opportunities for open innovation
- Intermediaries for open Innovation



Globalization

- Internet → Easy access to information
- Global market
- More competition
- Need to improve efficiency
- Need to improve quality
- Fast technology cycle
- Technology interdependency → Need to collaborate
- Intangible assets
- Knowledge based economy

Sustainable Development

- Growing human population
- Climate change
- Environment deterioration
- Polluted water, foods and other natural resources
- Perception by the general public of wide North-South disparity

What's Open Innovation (OI)



- Henry, Chesbrough, "Open Innovation", Harvard Business School Publishing, Boston MA, 2003
 - Outside - In : bringing external ideas and technologies into your company productions/services, P&G, APPLE APP STORE, GOOGLE Open source
 - Inside - out: licensing-out or public unused ideas and technologies in your own organization and turning those licenses into sources of value and revenue for you through other businesses, Microsoft, Honeywell, IBM, etc.(e.g., through licensing)

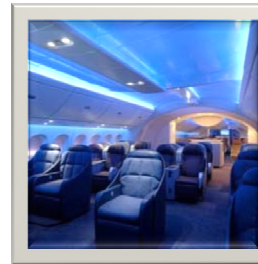
Example I: Procter & Gamble's

	2000	2008
R&D investment (% of sales)	4.8%	3.4%
The success rate of new products	15-20%	50%

- 50% of the company's products derived from external innovation
- Connect + Develop : a 2-way exchange of ideas and feedback with industry & users

Example II: Boeing 787

- Innovation Partner: Innovia Technology
www.innoviatech.com
- Mission: Build a new passenger jet with dramatically increased flight range.
- Result: Advanced LED lighting that makes the cabin seem more spacious and emotionally comforting.



CI and OI

Closed innovation	Open innovation
Examples: nuclear industry, mainframe computers	Examples : PC, movies
Mostly internal ideas	Many external ideas
Low collaborative innovation is part of OPEN INNOVATION	High collaborative innovation is part of OPEN INNOVATION
Low role of the venture capital	Active venture capital
Few new businesses, weak ones	Many new businesses
Universities are not important as the sources of ideas	Universities are important as the sources of ideas and people

University level Joint Research Centers in TH

- Tsinghua-Toyota Joint Research Center
- Tsinghua-United Technologies Corporation Research Institute for Integrated Building Energy, Safety and Control Systems
- Tsinghua-Siemens Centre of Knowledge Interchange
- Tsinghua-Veolia Advanced Environmental Technology Joint Research Center
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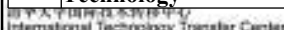
~4million US\$/ 5 years



Department Level Joint Research Centers in TH

No.	Institution Name	Cooperation
1	THU (SIST) -Nokia Joint Research Lab	Nokia, Finland
2	THU (SIST) - HP Joint Lab on Multimedia TEchnology	HP, USA
3	THU—Intel Joint Research Institute	Intel, USA
4	THU—Hitachi Joint Lab on Ubiquitous IT	Hitachi, Japan
5	THU (SIST) - NXP “Live Experience” Joint Research Center	NXP, Netherland
6	THU - Microsoft Joint Lab on Multimedia	Microsoft, USA
7	THU - IBM Joint Lab on Service Science	IBM, USA
8	THU - Renesas Joint IC Design Center	Renesas, Japan
9	THU (RIIT) - JMC u-Korea Broadband Multimedia Transmission Joint Research Center	JMC, Korea
10	THU (RIIT) - Intertrust Digital Copyright Management Joint Lab	Intertrust, USA
11	THU (RIIT) —Hongkong Applied Science and Technology Research Institute (ASTRI) Joint Lab on Digital TV Transmission Technology	ASTRI, HK China

~ 1.5 million US\$/ 3 years



ORGANIZATION

Challenges

- Open innovation hinges on a companies ability to identify, manage, and exploit a network of innovators. If they aren't knowledgeable of the intentions and process, all of the large companies' efforts are wasted.
- Large companies may make effort to foster the open communities.

Challenges

- Operational & Organisational issues
- Business Model
 - How to get profit from OI activities
- Loss of control
 - What external information to bring inside
 - What internal information to take outside
- IPR & Legal

Opportunities for Open Innovation

Achievements

- OI is really becoming part of industry practice in CPGs industry, such as P&G, Kraft, Clorox, Colgate Palm, SC Johnson, etc.
- OI happens in the Electronics and information technology and pharmaceuticals as well.
- In Auto industry, Ford has partnership with Microsoft and Volkswagen allow customers to complete their automobile (SMART)

OI in Service Businesses

- What we know about OI always comes from developing new products and new technology, while in the US and other OECD countries, 60% -80% of the economic activity is coming from service businesses.
- OI applies in service businesses can also harness the benefits of being open, collaborating, exchanging, licensing in and out, developing new business models.

OI in Environmentally Sound Technologies (ESTs)

- ESTs encompass technologies that have the potential for significantly improved environmental performance relative to other technologies. Broadly speaking, these technologies
 - protect the environment
 - use resources in a sustainable manner
 - recycle more of their wastes and products
 - handle all residual wastes in a more environmentally acceptable way than the technologies for which they are substitutes

Tsinghua Low Carbon Energy Research

- Studies on Energy Strategy & Low Carbon Economy
- Low Carbon Energy Technologies Research
- TMC Union (Tsinghua -- MIT -- Cambridge)



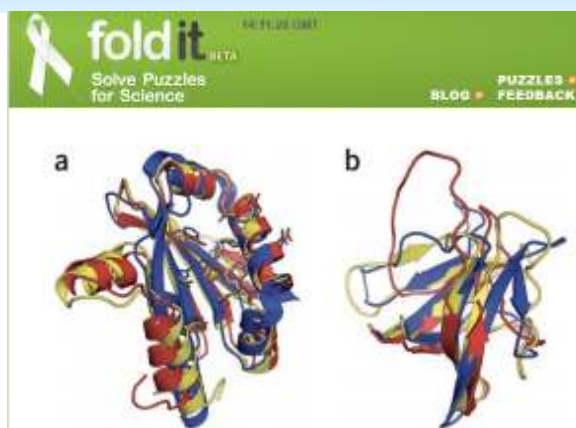
International Collaboration

- China-US Research Center for Energy & Environment Technologies
- Tsinghua-BP Research Center for Clean Energy
- China-Japan 3E (Energy, Environment and Economy) Institute
- Tsinghua-MHI R&D Center
- Tsinghua-IHI Research Center
- Tsinghua-Toshiba R&D Center

Intermediaries for Open Innovation

Foldit Gamers Solve AIDS Puzzle That Baffled Scientists for a Decade

- Crystal structure of a monomeric retroviral protease solved by protein folding game players in just three weeks.
- This is the second Nature paper we published with Foldit discoveries.



Nature structural & molecular biology

Some intermediaries

- Intermediaries help to accelerate the Cross Border Collaboration between University, Public Institution and Industry
 - OTL, Shanghai Institutes for Biological Sciences
- There have some intermediaries promoting open innovation, such as
 - NineSigma <http://www.ninesigma.com/>
 - Yet2.com <http://www.yet2.com/>
 - Innovia Technology <http://www.innoviatech.com/>
 - Innovation Exchange <http://www.innovationexchange.com/>
 - InnoCentive <http://www.innocentive.com/>

NineSigma -- Services

- NineSigma gives Solution Providers the opportunity to partner with our Global 1000 clients to help them further enhance their innovation capacity.



NineSigma's Network

- They have access to solution providers in more than 135 countries who represent diverse science and technology areas including: biotechnology/biomedical, chemical, electrical/engineering, food technology, green technology, materials, mechanical and industrial engineering and more.

NineSigma's Network

- The solution providers includes innovators working across all enterprise types including
 - Large companies
 - Small/medium-sized enterprises (SMEs)
 - Universities
 - Government labs
 - Trade organizations
 - Research institutes
 - Individual innovators

A OI Case from NineSigma: Alternative Energy Solutions

- Client: Schlumberger Limited
- The company wanted to develop geothermal energy solutions and had previously conducted research on geothermal opportunities.

A OI Case from NineSigma: Alternative Energy Solutions

- Phase 1
 - The NineSigma Intelligence Team began by interviewing key people and conducting extensive research on the topic.
 - One critical part of the process was NineSigma's coordination of cross-company meetings that brought together people who each had a stake in the innovation project.

A OI Case from NineSigma: Alternative Energy Solutions

- Phase 2
 - the evaluation of external technologies to align with the company's internal capabilities

Thank You!

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