Open Innovation and Open Business Models: 
A new approach to industrial innovation

Presentation to Joint OECD/
Dutch Ministry of Economic Affairs
Conference on “Globalization and Open Innovation”

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Agenda

• Open Innovation
• Open Business Models
• Implications for Managing IP
• Policy Implications
The Current Paradigm: A Closed Innovation System

Science & Technology Base

Research Investigations

Development

New Products /Services

The Market

R  D
The Open Innovation Paradigm

Internal Technology Base

External Technology Base

Licensing

Technology Spin-offs

Technology Insourcing

Other Firm’s Market

New Market

Current Market

R  D
“The creation of new businesses is a highly dynamic process, best represented as a horizontal funnel” (passed in iterative steps)

Robert Kirschbaum, DSM: Research & Technology management, July – August 2005
IBM & Open Innovation

Internal Technology Base

External Technology Base

Java, Linux

Global Svcs

Sun, and others’ eqmt

Technology Insourcing

$1.9 B licensing, OEM for semi co’s ODM for others

Other Firm’s Market

New Market

Current Market

R D
Is this just for High Tech? Procter & Gamble

Current Market

“Use it or Lose it”

Other Firm’s Market

New Market

Current Market

Internal Technology Base

External Technology Base

Technology Scouts

Venture Acquisitions “Spinbrush”

Large Acquisitions “Gillette”

R ------- D
The Logic of “Open Innovation”

• Good ideas are widely distributed today. No one has a monopoly on useful knowledge anymore.
• Innovation is now done within networks of firms, rather than within a single firm
• Not all of the smart people in the world work for us.
Agenda

• Open Innovation
✓ Open Business Models
• Implications for Managing IP
• Policy Implications
Which Would You Rather Have?

• A Better Technology

Or,

• A Better Business Model
Go with the Business Model

• Business Model > Technology
  – Ability to profit from technology
  – Ability to scale technology
  – Ability to continue innovating technology
  – Ability to acquire technology
IBM: Its Closed Value Chain

Value-Added Activities

Materials
- Chips, devices
- Operating Systems
- Computers
- Productivity SW
- Applications

Atoms

Solutions

All IBM – pre 1993

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IBM’s Open Business Model

Value-Added Activities

Atoms

IBM Chain

OEM Market

Integration

Applications

Productivity SW

Operating Systems

Computers

Chips, devices

Materials

Solutions

Other Integrators

Applications

Productivity SW

Operating Systems

Computers

Chips, devices

Materials
IBM’s Open Source Business Model

- Spends about $100M each year on Linux
  - 50% for general improvement
  - 50% for specific improvements for IBM gear
- Others spend another $800M a year
- IBM creates value through Linux
  - Also donates development tools, patents
- IBM captures value through value-added services and software “up the stack”
Agenda

• Open Innovation
• Open Business Models
✓ Implications for Managing IP
• Policy Implications
The Role of IP in the Business Model

• A business model has two functions:
  1. Value creation
  2. Value capture

• IP is critical for *value capture* in many business models

• IP can also be valuable in *creating value*
  – Setting standards
  – Intellectual commons
  – Defining the space for the innovations of others
Fig. 4.1
Evaluating Technology Alignment with Patent Coverage

Patent Coverage

Technology Coverage

Unused Protection Region

Protected Region

Unprotected Use Region

Party 1
Fig. 4.2
Complex Technology Alignment with Patent Coverage, when Two Parties Have Conflicting Claims

Party 1

Patent Coverage

Technology Coverage

Party 2

Patent Coverage

Technology Coverage

Assertion Region

Infringement Region

Impaired Region
Fig. 4.3
Complex Technology Alignment with Patent Coverage, when Second Party does not Practice Technology

<table>
<thead>
<tr>
<th>Patent Coverage</th>
<th>Technology Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Party 1</strong></td>
<td></td>
</tr>
<tr>
<td>Patent Coverage</td>
<td></td>
</tr>
<tr>
<td><strong>Party 2</strong></td>
<td>Infringement Region</td>
</tr>
<tr>
<td>New Infringement Region</td>
<td></td>
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<tr>
<td>Now Irrelevant Assertion Region</td>
<td></td>
</tr>
</tbody>
</table>
Fig. 4.5
IP Mapping Value Chain Analysis: Printers

Enabling Technology
- Controllers
- Print Heads
- Lasers
- Sensors

Equipment
- Manufacturing
- Integration
- Testing
- Connectivity

Installation
- Site Prep
- Assembly
- Testing
- Programming

Consumables
- Ink
- Paper
- Quality Control
- Scheduling

Operation
- Programming
- Monitoring
- Procedures
- Scheduling

Repair and Service
- Diagnostics
- Testing
- Procedures
- Parts

= Moderate IP risk
= Strong IP position (possible assertion opportunity)
= High IP risk
= Low IP risk
The IP Management Life Cycle

Figure 4.6

Stages in the Technology Life Cycle

- Become the standard
- Grow the standard
- Compete within the standard
- Harvest the standard

Emerging  Growth  Maturity  Decline
Managing IP for MS Windows

Mature market in US
- Windows has won the war to be the standard
- So strongly enforce copyright to prevent piracy
- Every illegal copy of Windows is money lost

Growing market in China
- Windows and Linux still battling
- So do NOT enforce copyright (not yet)
- Every illegal copy of Windows is one less for Linux

- IP Management Must be Driven by the Business Model
The IP Management Life Cycle

Figure 4.6
Stages in the Technology Life Cycle

- **Emerging**
- **Growth**
- **Maturity**
- **Decline**

- **Time**

- **US**

- **China**

- **Become the standard**
- **Grow the standard**
- **Compete within the standard**
- **Harvest the standard**
Example of recorded reassignment:

“Intellectual Ventures LLC, a technology development and licensing start-up formed by Microsoft veterans Nathan Myhrvold and Edward Jung, has won the bidding for General Magic Inc's portfolio of patents and other intellectual property, paying $300,000.”
USPTO Patent Reassignment Data

- Rising faster than base of patents itself, from 0.1% to 4.0%
Main Reassignment Kinds

- Assignment (of assignors interest)
- Security agreement/termination
- Government interest assignment
- Executive order 9424, confirmatory license
- Merger
- Change of Name
- “Other”

From the examination of semiconductor class:
- Change of Address
- License
- Confirmatory license
- Conveyance of patent & trademarks
- Correction to an error in the patent number
- Release by secured party
- Release of security interest in patents and trademarks
- Release of security interests
- Security interest
- Termination and release of assignment of security
- Transfer by operation of law
- Amended and restated patent and security agreement and mortgage

Offered as an option in the PTO 1595 form
Reassignments in Semiconductors (H01L): 2003

- Affiliated Co: 61%
- Securitization: 23%
- Pure & Autonomous: 3%
- Impure & Autonomous: 3%
- Ind. Inventors: 1%
- Merging: 2%
- License: 1%
- Other: 6%
- Pure & Autonomous: 3%
Security: US 5149397

- Two reassignments for this patent:

<table>
<thead>
<tr>
<th>Date</th>
<th>Assignor</th>
<th>Assignee</th>
<th>Reassignment Kind</th>
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<tbody>
<tr>
<td>06/21/2002</td>
<td>Xerox</td>
<td>Bank One</td>
<td>Security Interest</td>
</tr>
<tr>
<td>06/25/2003</td>
<td>Xerox</td>
<td>JPMorgan Chase Bank</td>
<td>Security Interest</td>
</tr>
</tbody>
</table>

What’s Going On?

• “Your findings are consistent with what I have seen. That is, I have seen more security interests being taken in a company's patent rights (typically to collateralize debt).”

• The beginnings of a secondary market for IP.
IP Secondary Markets in the Future

- Orphan recovery programs
- Failed Startup IP auctions
- “Use It or Lose It” corporate policies
- Bounties and Finders’ Fees
- Sale-Leaseback programs
- Patent roll-up strategies
- Patent commons areas
Agenda

- Open Innovation
- Open Business Models
- Implications for Managing IP

✓ Policy Implications
Policy Implications

• Case Study: US economic malaise in the 1980s
  – Auto’s
  – Steel
  – Consumer electronics
  – Shipbuilding
  – semiconductors
US Resurgence in the 1990s

• New companies, new industries
  – PCs, networking, software
  – Internet
  – Biotechnology
  – New kinds of semiconductors

• Note that the troubled firms in the troubled industries did not improve much
Closed v. Open Policies

- Focus on expanding domestic market
- Protect local champions from foreign competition
- Subsidize largest domestic firms
- Limit foreign students and foreign direct investment
- Focus on SMEs
- Focus on universities
- Focus on IP policies
- Stimulate greater competition among largest firms
- Stimulate greater information exchange and coordination
Getting the Institutions Right

• Public research funding
  – The foundation of the innovation system
  – Focus on excellence, meritocratic award criteria

• IP
  – Clear, effective, but limited protection

• Universities
  – Meritocracy in research funding
  – Allow professors to engage with industry
  – Compete for “best and brightest” students
  – Enable research to move into industry
The Challenge of Indirect Policies

• No clear constituency
• Time delay from policy change to results
• Interaction among institutional factors, not a single factor solution
• We underestimated strength of US innovation system in 1980s
  – We may be underestimating its weaknesses today
• Note that Japan has regained ground, with a very different institutional structure than US
• Note that OECD estimates China’s R&D > Japan