Technology Commercialization & Intellectual Property Value Creation

By Zaid Hamzah
18 April 2012

Email: zaid.hamzah@fulbrightmail.org
www.strategiclawyering.com
www.intellectualfutures.com

Study Visit of Innovation and Technology Support Offices (ITSO) from the Philippines to the WIPO Office in Singapore (WSO) and Intellectual Property (IP)-related Institutions in Singapore

organized by
the World Intellectual Property Organization (WIPO)
Singapore, April 18 and 19, 2012
About Zaid Hamzah

• Advocate & Solicitor, Singapore
• Solicitor, England & Wales
• Author of 8 books including “Intellectual Property Law & Strategy” “Creating Value From Technology Innovation” (other 6 books on Strategic Legal Risk Management, Electronic Security Law, Information Technology Contracts, Biotechnology, Biomedical Science Law, Private Equity and Venture Capital)

Over 26 years of professional work experience including:
• Director for Intellectual Property at Microsoft, Asia Pacific,
• Chief Legal, Regulatory & Compliance Officer, Telekom Malaysia
• Founder of software company, i-Knowledge Technologies
• Principal, SLG Consultants (regional business & investment consultancy)
• Lawyer, Khattar Wong & Partners (law firm in Singapore)
• Singapore Government Service

Present Role: Advisor to governments, enterprises, research institutions on IPR, technology commercialization, IP-based financing, intellectual capital management
Entrepreneur: www.intellectualfutures.com

Desired Outcomes

At the end of this program, participants will be able to:

• Develop commercially-oriented strategies to maximize IP value creation
• Understand how technology commercialization & strategic IP management can improve the organization’s bottomline
• Understand IP-related deal structuring & deal making
• Formulate a practical roadmap for IP commercialization in the marketplace
Program Structure

* Program Overview
* Interaction: Participants highlight specific issues/cases/transactions

Part 1: Technology Commercialization, Intellectual Property and Business Issues

Part 2: IPR Value Creation & market rollout

Part 3: IP based Financing

Part 4: IP-based Deals: Structuring and the Art of Closing Deals

Overview & The Big Picture
Within the last quarter century, the market value of the S&P 500 companies has deviated greatly from their book value. This “value gap” indicates that physical and financial accountable assets reflected on a company’s balance sheet comprises less than 20% of the true value of the average firm. Research from Ocean Tomo, a leading IPR Investment Banking firm, shows that a significant portion of this intangible value is represented by patented technology.

### Strategic Setting

- As economies transition to become more knowledge-based or innovation-driven, intellectual capital will increasingly become a major economic value driver.

- Ratio of intellectual capital to market capitalization in US companies grew from 17% in 1975 to 80% in 2005.

- Data from the US, Europe & Japan indicates that the more intellectual property a company holds, the higher its valuation.

- Intellectual Property and Technology Investment banks have emerged as key financial players in this new landscape.
Economic Transformation: From “IP negative” to “IP positive”

Japan took 30 years while South Korea took 15 years.

Source: Tynax presentation slides (Jon Rortveit)

IP Ecosystem or Value Chain

1. CREATE
2. COMPETITIVE ADVANTAGE
3. PROFIT GROWTH
4. EXPLOIT
On innovation & value creation

“Innovation is the only limit to growth”
Bill Gates

“We certainly have one of the world’s highest quality patent portfolios, and now one of the largest. That is just one measure of innovation. The challenge for us now and in the future will not be whether or not we can have the ideas and get the patent, it’s whether or not we can convert that into business value in the form of a product that customers really appreciate and will pay for”

Craig Mundie
Microsoft Chief Research & Strategy Officer
Some insights from seasoned players on technology innovation

“Not all innovations make good products, and not all good products build profitable companies” Kellogg School of Management

“Usually the technology isn’t the problem but the route to market & how to scale the business…….”
Darrell Mann, leading innovation management system expert

Key Lessons from Industry on Technology Commercialization........

It is all about creating the revenue pipeline and having a clear path to profitability driven primarily by what the market needs......

But it is not that easy to execute robust marketing programs that locks in value in a sustainable manner

The big challenge – how to transform R&D outputs into economic value
Economic Model & the New Value Chain
Shift in economic value chain will affect the supply chain

**Intellectual capital**
New Value Driver

- Value creation
- Human Capital & Innovative outputs
- Intellectual assets
  - Intellectual property
- Patents
  - Copyrights
  - Design
  - Trade mark

**Desired End State**
- HIGHER-SKILLS
- HIGHER VALUE JOBS
- HIGHER SALARIES

Firm level competitiveness
Go to Market with higher value products & services

Higher Income Nation

**Commercial Strategy – Deep Vs and shallow Ts**

The commercial model should be a mix of many shallow Ts & a few deep Vs – high volume/low margins products & services complemented by a few low volume/high margins ones.

Deep V represents the few emerging technologies that meet global ‘cutting edge’ standards.

Shallow "T"s that represent non cutting edge technologies that meet market demand & can generate sustainable value without the complexity of marketing new technology.
Parallel IP & Technology Commercialization Streams

Strategic IPR Roadmap

**Strategize**
- Define challenges, issues
- Market analysis
- Portfolio analysis
- Financial analysis
- Develop strategic plans

**Innovate**
- Product & process
- Technology Intelligence
- Map to strategic business goals
- Comply with legal requirements

**Execute**
- Develop processes
- Develop structures
- Develop metrics
- Set targets with timeline
- Review

INTEGRATED, HOLISTIC, STRUCTURED
Value Map for Higher Income Business Eco-system

- Business Model & Type of Enterprise
- Knowledge Technology
- Services
- Product
- Distributorship
- Innovation
- Ideation
- Proof of concept
- Development
- Market Test
- Clinical Trial
- Proof of value
- Go To Market
- Strategy Design
- R & D
- Financing
- Accelerate better ROIC* at firm level as national growth driver

*ROIC – returns on invested capital

PART 1

Intellectual Capital, Intellectual Property & Business Strategy
IPR is now widely regarded as the 6th asset class

Innovation, IP and Business Strategy

An industry-driven program to develop strategic skills and management capabilities
Innovation, Creativity
Know-how, methodology
Intellectual Property Rights

IPR: Patent, Copyright, Trade Secret, Trademark, Design Rights

Factors of Production – 21st Century

Intellectual Capital
Social Capital
Creative Capital
Economic Setting

Economic transformation is already taking place

- Factor-driven economy
- Efficiency-driven economy
- Innovation-driven economy

Challenge: How to accelerate the transformation, grow the economy and capture new value

Different value drivers affect different regions/countries along the development path

It is easy to move from factor-driven economy to efficiency-driven economy – but it is much more difficult to move from efficiency-driven to innovation-driven economy
Michael Porter on Global Trends & Competitiveness

Global Trends
- Globalization of Markets, Value Chains, Knowledge
- Innovation & skills - an increasing share of value add
- Services - an increasing share of value add

Competitiveness
- Competitiveness depends on productivity
- The bar for competitiveness is rising
- Competitiveness in the global economy is a positive-sum game
- A sound macroeconomic, political, legal & social context creates the potential for competitiveness, but it is not sufficient
- Only firms create wealth, not governments

The Microeconomic Foundations of Economic Development

A nation’s prosperity depends on its competitiveness, which is based on the productivity with which it produces goods and services. Sound macroeconomic policies and stable political and legal institutions are necessary but not sufficient conditions to ensure a prosperous economy.

Competitiveness is rooted in a nation’s microeconomic fundamentals—the sophistication of company operations and strategies and the quality of the microeconomic business environment in which companies compete. An understanding of the microeconomic foundations of competitiveness is fundamental to national economic policy.

Michael E. Porter
Microeconomic foundations of economic development are the operating practices and strategies of firms as well as the business inputs, infrastructure, institutions, and policies that constitute the environment in which a nation’s firms compete.

Recent research suggests that microeconomic differences account for much of the variation across countries in GDP per capita. The microeconomic foundations of economic development are embodied in the diamond: factor conditions, demand conditions, context for firm strategy and rivalry and related and supporting institutions.

Michael E. Porter

**Challenge 1: How to leapfrog into the high value/high volume quadrant**

- **Low Volume/High value**
- **High Volume/High Value**
- **Low Volume/Low Value**
- **High Volume/Low Value**

More higher value skills & jobs → higher pay → wealthier economy

**Challenge 2: How to sustain leadership position & be ahead of the curve**
RETURN ON INNOVATION INVESTMENTS (ROI 2)

It is all about better yield, better value from investment

Drivers, Enablers, Levers in the Eco-system: Managing the Supply Chain & the Calibration

Commercial Strategy
Industry economics will determine commercial outcomes – enterprises are driven ultimately by profitability goals & shareholder value creation

Only when enterprises succeed will economies thrive

Development Strategy & Model
When enterprises succeed, there will be more jobs - when enterprise move up the value chain, higher skills & higher pay will follow

Regulatory environment will impact investment

Innovation Cycle
Governments invest in R&D but returns on research investment are secured primarily through commercialization by enterprises

Maximize economic yield

Value Creation
- Exploit Competitive Advantage
- Maximize economic yields

Investment Value Chain
Both enterprises & nations invest but enterprises are more critical (as government only facilitates

Returns on research investments

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Capturing Value in the Economic Eco-system

**VALUE CHAIN DYNAMICS**
Value chain breadth & depth has to be enhanced

- **Supply**
- **Innovate Products & Services**
- **Collaborate**
- **Penetrate Marketplace**
- **Productize**

Need to determine actual value drivers, enablers and levers that will have multiplier effect on the economy in a sustainable manner.

Need to determine where the nation/state/region is in the value continuum.

Once strategic assessment has been made, the rest is execution to ramp up economic growth.

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Intellectual Capital is a New Major Value Driver

Intellectual Capital & other “soft” capital are the only sustainable source of competitive advantage.

**Strategic Investment in Intellectual Capital Infrastructure**

Unique selling proposition needed to demonstrate end to end value creation from ideas to marketplace (moving beyond static national boundaries).

Strategic international/regional collaborative structures driven by intellectual capital must be created and the Open Innovation Model promoted.

Foreign & domestic investment pipeline has to be tweaked, calibrated to enhance intellectual capital value capture and exploitation.
ECO-SYSTEM FOR INNOVATION & IPR

Innovation
- Research and Development
- Manufacturing
- Product Development

Technology Management

Technology

Intellectual Property Rights
- IP Strategic Counseling
- Invention & R&D legal issues
- Patents, Trademarks, Copyright, Trade Secrets
- Creation, Protection & Management of IP Portfolios
- IP due diligence

Commercialization
- Technology Transfer
- Licensing & Distribution

Commercial Transactions
- Mergers and Acquisitions
- Supply/Service Agreements
- Property Transactions
- Joint ventures and Strategic Alliances
- IPO and Business Combination
- Outsourcing
- Due diligence (technology, legal, financial, green)
- Technical Assistance and Support

Project Development & Financing
- Fund Formation
- Corporate Restructuring
- Private Placements
- Equity Investments
- Taxation & Tax Incentives

Strategy Design
The Intertwined Operating Environment

Policy Framework

Business & Financial Infrastructure

Law & Regulations

IMPACT ECONOMIC VALUE CREATION & GROWTH

Strategic Economics: Finding the points of value calibration

Value drivers, levers and enablers in the economic “food chain”

R&D

Intellectual Capital
Innovation, know-how, insight methodology, expertise,
Intellectual Property Rights

Risk Capital
VC funds, debt ventures
Technopreneurship Entrepreneurship

Firm level competitiveness
Market performance
Industry development

VALUE CAPTURE

Go to Market - Technology Commercialization & IP Licensing

VC funds, debt ventures

Higher Income
Economic Growth
Wealthier Nation

Strategic Economics: Finding the points of value calibration
COMMERCIAL VALUE CHAIN

RISK CAPITAL

IP/Tech Fund
Fund manager
IPR Bank
Tech Licensor

Technology & IP - creating Research Institutions & Enterprise

SPV: Special Purpose Vehicle
IPR: Intellectual property rights like patents, copyright

4 Key Operating Spheres

Build relationships
Develop Structured Programs
Build Coalitions & 3rd Party Advocates

Shaping Policy Environment & Regulatory Advocacy

Corporate Governance, Compliance & Ethics

Brand & Reputational Protection (“soft assets”) & Intellectual Property

Robust Business Growth

Risk Avoidance – insulate against future risks
Value Creation – prepare the ground for robust corporate growth
Broad Sequence of Activities

1. Evaluate Needs – strategic audit
2. Design Policy Risk & Value Creating Management Framework
3. Develop Programs
4. Enforce Systems and Processes
5. Assess Impact

Key Issue: What are the drivers, levers & enablers to create value & avoid risks?

Broad Approach in Strategy & Program Design

Risk Avoidance
Value-driven
Role-driven

Most commercial role ends at the bottom line........It is all about enhancing business performance & ensuring profitability
Need to understand & manage commercial dynamics

Drivers
Levers
Enablers

Performance-based outcomes

Strategic
Technical
Tactical

Need to understand & calibrate deal drivers, levers and enablers to secure desired commercial outcomes

Moving the Spheres Together

BUSINESS VALUE CREATION

Growth
Opportunities

PROBLEMS
SOLUTIONS
Transaction
The Steps & Sequencing

1. **Gap Analysis**  
   Assess needs, challenges & resource availability that would impact the growth of business

2. **Design Systems**  
   Once a comprehensive risk assessment or value creating opportunity audit has been completed, design the government affairs and regulatory risk management framework with tight control measures.

3. **Secure buy-in**  
   Stakeholders’ support must be secured

4. **Execute**  
   Assess capacity to execute meticulously - risk controls are key

Assess present needs & priorities

- **Understanding the Needs of Businesses**
- **Strategic Risk Management**
- **Growing the Business**
- **Governance & Compliance Challenges**
- **Operational bottlenecks**

It is all about creating a conductive environment to advance commercial objectives while avoiding or minimizing risks.

Assess → Strategize → Design Programs → Execute!
Strategic Planning Approach – Long Range Thinking

**Where we are**
- **Assessment**
  - PESTLE* Scan & Strategic Insights
  - Data collection & Analysis (evidence-based)
  - Situation Analysis
  - SWOT – Strengths, Weaknesses, Opportunities, Threats

**Where we want to be**
- Baseline
  - Mission & Vision
  - Values / Guiding Principles
  - Major Goals & Desired End State
  - Strategic Gaps
  - Constraints & Resources
  - Global Best Practices

**How we will do it**
- Goals & Objectives
  - Specific Objectives
  - Priorities
  - Strategic Choices
  - Policy Innovation
  - Global Best Practices
  - Specific outcomes expressed in measurable terms (NOT activities)
  - Planned Actions to Achieve Objectives

**How to measure performance**
- Strategies & Action Plans
  - Performance Management (incl value management)
  - Targets / Standards of Performance
  - Programs & Action Plans (including alignment)
  - Timelines
  - Budget

**Strategies & Action Plans**
- Evaluate
  - Review Progress – Balanced Scorecard
  - Take Corrective Actions
  - Feedback upstream – revise plans

*PESTLE* Scan: Political, Economic, Social, Technological, Legal & Environmental (Global, Regional & Local Trends & Developments)
Policy design elements to be reviewed & aligned

STRATEGY

VALUES & GOALS

EXTERNAL DIMENSIONS (INTERNATIONAL)

OUTCOMES & IMPACT

ORGANIZATIONAL CAPABILITIES

STRUCTURES & SYSTEMS

PROCESSES & PROCEDURES

Gap Analysis

Baseline / Org Profile

Challenges / SWOT

Gap = Basis for Long-Term Strategic Plan
PART 2
IPR Commercialization
IPR Activity Mapping

<table>
<thead>
<tr>
<th>CREATE</th>
<th>PROTECT</th>
<th>MANAGE</th>
<th>FINANCE</th>
<th>EXPLOIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D</td>
<td>Audit</td>
<td>Integrate Corporate Strategy</td>
<td>Valuation of IPR</td>
<td>Licensing</td>
</tr>
<tr>
<td>IPR Development</td>
<td>Registration (national &amp; international)</td>
<td>IPR Portfolio analysis</td>
<td>Collateralize</td>
<td>Assignment</td>
</tr>
<tr>
<td>IPR Acquisition</td>
<td>Risk Management System</td>
<td>Competitive Technology Intelligence</td>
<td>Securitize</td>
<td>Divestment</td>
</tr>
<tr>
<td>Build new IP capability</td>
<td>IPR Litigation</td>
<td>Develop Strategic Plans</td>
<td>Capitalize (paid up capital)</td>
<td>Replicate/ Manufacture</td>
</tr>
<tr>
<td>Productize/Test-bedding</td>
<td>IPR Dispute Management</td>
<td>Develop risk management framework</td>
<td>Raise funds (debt/equity)</td>
<td>Alliances</td>
</tr>
</tbody>
</table>

Execution Mode & Tools

<table>
<thead>
<tr>
<th>DEFENSIVE</th>
<th>OFFENSIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Protect your market</td>
<td>• Develop strategic walls (eg patent wall or thicket)</td>
</tr>
<tr>
<td>• Sue others</td>
<td>• Create new markets through patent filing</td>
</tr>
<tr>
<td>• Develop blocking measures</td>
<td>• Form alliances (patent pool)</td>
</tr>
<tr>
<td></td>
<td>• Develop “standards”</td>
</tr>
<tr>
<td></td>
<td>• Trade, exchange</td>
</tr>
</tbody>
</table>

Measurements and Metrics
Parallel IP & Technology Commercialization Streams

Value Map for Higher Income Business Eco-system

*ROIC – returns on invested capital
Commercialization Principles

- Strategy Design: Doing the Right Projects
- Project Execution: Doing those Projects well
- Learning: Do it even better next time

Design right strategy
Do the right projects
Make the right investment

Ensure resources available
Execute meticulously
Monitor performance

Commercialization Strategy

Strategize ➔ Innovate ➔ Protect IPR ➔ Commercialize

Define Strategic Arena ➔ Define Strategic Goal ➔ Define Strategic Gaps ➔ Define Programs to Achieve Goals

Continue to Assess Environment
Assess internal & external factors

Commercialization of IPR and technology are separate but are tightly inter-
Elements of the Intellectual Capital Eco-system (at the enterprise level)

- Business strategy
- R&D strategy
- Competitive Technology Intelligence (round 1)
- Competitive Technology Intelligence (round 2)
- Strategic IP Commercialization Program
- Manage strategically
- Commercialize IP
- Go to market program (pre & post sales)
- Licensing Sale of product & services
- Returns on Invested Capital

Sequencing......need to take an integrated approach

How IPRs are monetized – IPR value chain

<table>
<thead>
<tr>
<th>Methods to Generate Revenue</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 License IPR to others</td>
<td>When you buy a software from say Microsoft, you have the right to use the software in the form of a license. The underlying source codes are the copyright owned by Microsoft Inc.</td>
</tr>
<tr>
<td>2 Royalty-based revenue</td>
<td>A biotech patent can be used in commercial transaction where the patent owner negotiate its expected returns based on a certain percentage of revenue, say 1-3 per cent</td>
</tr>
<tr>
<td>3 Inject IPR as capital in a venture</td>
<td>IPR can be capitalized in a company as payment in kind and value is generated from the profits of the venture</td>
</tr>
<tr>
<td>4 Sale of IPR</td>
<td>Like tangible assets, IPR can be sold or assigned. Once sold, the seller of the IPR no longer has any legal rights over the sold IPR</td>
</tr>
</tbody>
</table>
Focus must be on intellectual capital value extraction leveraging on licensing as the primary model.

**Commercialization Flow**

1. **Generate IPR**
2. **Protect IPR**
3. **Commercialize IPR & Know-How**

**External Funding**

**Internal Funding**

**Know-How Methodology Process**

**Process for extracting value from IPR**

**Business role for IPR**

**Initial evaluation opportunity to commercialize or not**

**Patenting evaluation**

**Business strategy and tactics**

**Product market matrix**

**Round 2 of competitive assessment**

**Commercialization decision process (final)**

**Commercialization $**

**R&D & other internal technology creation**

**Integrated innovation management**

**Intellectual assets portfolios**

* COMPETITIVE TECHNOLOGY INTELLIGENCE
INNOVATE – PROTECT - COMMERCIALIZE

**Intellectual capital**

- Value creation
  - Human Capital & Innovative outputs

- Value extraction
  - Intellectual assets
    - Intellectual property

**Complementary business assets**

- Alliances & Partners
- Distribution Channels
- Licensing Program

INNOVATE – PROTECT - COMMERCIALIZE

Technology Commercialization Challenges
Technology Commercialization Decision-making Flow Chart

R&D

Go / No go commercialization review

Commercialize through licensing

Revenue generation

The implementation route

The strategic planning route

CTI*

Idea

Guiding Principles for Technology Commercialization

- Licensing of know-how, software programs (copyright) or patented technology is usually the most viable option.

- Always take a market-driven approach to R&D. Innovative products don’t mean that it will make money—unless the market demands it & is prepared to pay for it.

- For universities & R&D organizations, the most viable business model is to focus on being a knowledge company that sells products/services based on intellectual capital.

- Don’t rely on more manpower to scale the business—to grow the business, commoditize the product/service.

* Competitive technology intelligence
The Starting Point

- Is the technology required by the marketplace?
- Does the technology meet the standards required in the industry?
- If your customer buys the product/services, what is the return on investment?

Business & Resources

- What is the business model?
- What are the revenue models?
- What is the path to profitability?
- What is the revenue pipeline?
- Do you have the resources to secure the commercial autonomy?

The Intellectual Capital Asset Structure

Asset Class

- Intellectual capital
- Relationship capital
- Brand capital

Innovation Capital (human capital)

Technology commercialization strategy to be driven more by IA licensing instead of being driven by patent.

Intellectual Asset (IA)

Business process, methodologies, know-how, experience, models, procedures

Intellectual property

Patent
Trade secret
Copyright
Trademark
The Challenges

• How to monetize intellectual capital?
• What is the optimal strategy?
Pathway to boost market performance

To scale the business, there is a need to transform the revenue driver from being people-dependent (say fees from training courses or development charges for software development) to licensing of technologies, know-how including methodologies and processes.

Strategic Gaps Identified

Competitive Technology Intelligence
2. Strategic Intellectual capital mgmt prog
3. Go to market Strategy Execution
4. Strategic Licensing Program

Need to develop a national program on CTI & strategic licensing

Evidence-based study needs to be carried to boost performance
Competitive Technology Intelligence

- Technical data, technology intelligence
- Business data, market intelligence

Organize, analyze, apply......

Broad strategic environmental scan

Long range

Short range
Technology Adoption Life Cycle:
Challenges in marketing new technologies

Governing Model
Technology Adoption Life Cycle

- **Pragmatists**: Stick with the herd!
- **Conservatives**: Hold on!
- **Visionaries**: Get ahead of the herd!
- **Skeptics**: No way!
- **Techies**: Try it!
- **Innovators**
- **Early Adopters**
- **Early Majority**
- **Late Majority**
- **Laggards**

Pragmatists create the dynamics of high-tech market development
This initiative will focus on this phase to minimize the commercial risks in the underlying activity.

Biotechnology Commercialization Case Studies
Designing *Intellectual Property-driven* Strategies & Tactics to Boost Market Performance
Definition of biotechnology (www.oecd.org)

The application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services.

Indicative List (not exhaustive)


Proteins and other molecules: Sequencing/synthesis/engineering of proteins and peptides (including large molecule hormones); improved delivery methods for large molecule drugs; proteomics, protein isolation and purification, signaling, identification of cell receptors.

Cell and tissue culture and engineering: Cell/tissue culture, tissue engineering (including tissue scaffolds and biomedical engineering), cellular fusion, vaccine/immune stimulants, embryo manipulation.

Scope of biotechnology (OECD)

Indicative List (not exhaustive) - continued

Process biotechnology techniques: Fermentation using bioreactors, bioprocessing, bioleaching, biopulping, biobleaching, biodesulphurisation, bioremediation, biofiltration and phytoremediation.

Gene and RNA vectors: Gene therapy, viral vectors.

Bioinformatics: Construction of databases on genomes, protein sequences; modelling complex biological processes, including systems biology.

Nanobiotechnology: Applies the tools and processes of nano/microfabrication to build devices for studying biosystems and applications in drug delivery, diagnostics etc.
### Specific Issues in Biotechnology Commercialization

**Biotechnology Commercialization Issues**

- Primary way of commercializing biotechnology inventions, products, processes or services is through licensing.

- To structure biotechnology licenses, it is important to understand both the technology and the proprietary protection issues.

  -- Much of the technology emerging from biotechnology industry relates to the methods of designing or identifying useful compositions, rather than to the novel compositions themselves

- Strategies to license early stage inventions differs from later stage inventions

<table>
<thead>
<tr>
<th>Intellectual Property Protection</th>
<th>Licensing</th>
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<tbody>
<tr>
<td>1 Patents</td>
<td>1. Out-licensing</td>
</tr>
<tr>
<td>2 Copyright</td>
<td>2. In-licensing</td>
</tr>
<tr>
<td>3 Trade Secrets/Know-How</td>
<td>3. Reach through licensing</td>
</tr>
<tr>
<td></td>
<td>4. Early versus late stage licensing</td>
</tr>
</tbody>
</table>
Case Study: Cohen-Boyer Recombinant DNA Technology

Much of biotechnology relates to methods of designing or identifying useful compositions instead of the novel compositions themselves.

- In Exhibit 9.1, the goal was to efficiently produce large amount of protein.

- A single gene is inserted in a host cell (usually a bacterium) to create a transfected cell.

- The transfected bacterial cells can then be grown in quantity and manipulated so as to produce protein encoded by the introduced gene.

Case Study: Cohen-Boyer Recombinant DNA Technology

What was patented (the “claims”)

Circle 1: Method of inserting a particular gene into a host cell

Circle 2: Transfected cells containing the inserted gene

Circle 3: Method of culturing the transfected cells to produce the desired protein

What was not claimed (& cannot be claimed) was the final product, the expressed protein produced by the practicing the invention.

Recombinantly produced proteins are generally not novel over the same proteins purified from nature – therefore unpatentable

The licensing terms

The first license’s terms were a US$10,000 up-front fee with a minimum annual advance (MAA) of US$10,000. Earned royalty rates on products were provided on a graduated basis for bulk products, end product sales, and process improvements on existing products based on production cost savings. Under the licensing agreements, Stanford received unprecedented royalties on downstream drug sales in a stipulation known as reach-through licensing; Stanford received end-product royalties based on a percentage of final product sales. The Cohen-Boyer IP rights extended to all products developed using the technology. If companies did not sign a license agreement, any end products they developed that used rDNA could potentially be contested.

"Although the final product – the recombinant produced by the bacterial factories – was not itself covered by the patent, the patented methods and transfected cells were, by definition, repeatedly used in the production of recombinant protein. Sale of the non patented final product served as the royalty base to compensate the patent holders for the repeated use of the patented methods and materials necessary to generate the non-patented product. Royalties based on non-patented product are described as reach through or flow through royalties."

Dr Cathryn Campbell

Distinction

-Critical difference between the Cohen-Boyer technology and the phage-display technology: While the claimed methods and compositions are repeatedly used to manufacture the final products in the Cohen-Boyer methodology, with phage-display, the claimed methods and compositions are used only to identify but not to manufacture the final product.

-Rights owner (Dyax Corporation) offered non-exclusive licenses that carried signing fees, maintenance fees and earned royalties.

-Milestone payments were due to the licensor as products proceeded towards FDA approval.

-The licenses provided the option of choosing relatively higher licensing fees and lower earned royalties or lower licensing fees and higher earned royalties.

Source: Dr Cathryn Campbell The LESI Guide to Licensing Best Practices, John Wiley & Sons Inc 2002

Case Study 2

The Jackson Laboratory

In this section:
- Find & order JAX® Mice
- JAX® Mice Database
- Most popular JAX® Mouse strains
- New JAX® Mouse strains
- Pre-conditioned JAX® Mice
- Breeding & maintenance services
- Categorization & recovery services
- Facility testing & pathology
- Genome science services
- Cells, tissues & products
- News & events
- Customer service & support
- Animal health & genetic quality

License for strains designated as "OncoMouse™"

Use of these strains must be subject to US patent 5,205,863. "Playing with cancer: mice expressing an oncogene" (1992), and Canadian Patent 212,042 (both by Walter U. Scherer) and licensed to J.J. DuPont de Nemours and Company (Canada). Mice identified as "OncoMouse™" are the JAX® Mice Line 27, catalog, and web pages provided by Jax. For further conditions of use required by Jax:

Conditions of use:
The animal(s) contained within this shipment are produced and distributed under patent rights licensed from DuPont. The recipient of the animal(s) is NOT authorized to (i) grow, increase, propagate, transfer possession of, or otherwise make use of, the animal(s) or biological material derived therefrom, without written permission from Jax. Any selling, leasing, offering for sale, or sending of the animal(s) or any biological material derived therefrom without an appropriate license will be considered an infringement of the patent rights by DuPont.

For licensing inquiries, please contact:

J.J. DuPont de Nemours & Company
Experimental Station 200
Al, 141 and Harry Clay
United States Patent
Leder et al.

[54] TESTING METHOD USING TRANSGENIC MICE EXPRESSING AN ONCOGENE

[57] Invenrors: Philip Leder, Chaohui He, Mow.; Timothy A. Stewart, San Francisco, Calif.


[21] Appl No: 07/750,018


[50] Related U.S. Application Data

[60] Continued from application No. 07/173,006, filed Mar. 22, 1990, Pat. No. 4,975,971, which is a division of application No. 465,297, filed Jan. 22, 1984, Pat. No. 4,776,080.

[51] Int. Cl: C 12N 3,000; A 01K 67/00; A 01K 69/00; A 01K 67/027

[52] U.S. Cl: 208/1, 800/10, 800/18, 428/32

[58] Field of Search: 800/1, 800/2, 208/1, 428/2, 9, 52, 425/172, 240/2, 517, 935/32, 70

[56] References Cited

U.S. PATENT DOCUMENTS


McKee et al., Expression of the Chicken Transferrin Gene in Transgenic Mice, Cell 34:335-341, 1983.


Case Study 3
Microsoft licenses out its software (copyright and patents) to end users as a key commercialization strategy of its R&D in bioinformatics and life science solutions.
Roche Diagnostics

Biotech Firm Implements Efficient IT Document Management System to Meet Compliance Needs

A leader in in-vitro diagnostics, Roche Diagnostics manages a vast and expanding volume of molecular insights and translates it into products with high medical value for physicians and patients. Because of the complex and detailed nature of this work, Roche Diagnostics has stringent requirements for document management and storage. The company wanted to replace its existing document management system for 12 projects with a new solution offering a more robust feature set. With help from Microsoft®-certified Partner Atego International, Roche Diagnostics built a solution based on Microsoft Office SharePoint Server 2007, providing comprehensive security features, workflow support for the entire document life cycle, and automated Portable Document Format (PDF) rendering and publishing. The solution is designed to comply with strict U.S. Food and Drug Administration regulations.

Situation

Roche Diagnostics and its innovative diagnostic tools and systems play a pivotal role in integrated healthcare solutions, covering the early detection, targeted screening, evaluation, and monitoring of disease. With more than 11,000 employees worldwide, Roche Diagnostics is active in all market segments, from scientific research and clinical laboratory systems to patient self-monitoring.

Roche Diagnostics decided it was time to replace its aging BMC Document-based software for managing and storing electronic IT documents. The goal was to take advantage of the possibilities offered by a new cutting-edge document management system.
Part 3
IP FINANCING

What are the shift in value chain elements?
Where is the value flow (end to end)?
What is the value capture strategy?
Identify value drivers, enablers & levers

Strategically manage the investment value chain

Recognize that investment really has no “end destination” in a globalized value chain

Constantly and dynamically move along the value chain to capture new sustainable value

Seek intellectual capital investment that yield maximum economic impact (KBE angle)

Have deeper understanding of industry & business economics

Investment Value

IP Finance

1. IP as source of revenue – licensing, sale
2. IP as asset to back lending/investment
   1. IP collateralization
   2. IP Securitization
3. IP as an asset to be capitalized (part of paid up capital – IP as equity
IP-Based Investment

1. Direct investment into company
2. Fund (eg Private Equity/Venture Capital)
3. Funds of Fund
What an IP investment bank does

**IP Investment Bank**

**Transactions**
- IP-collateralized Debt
- IP Securitization
- Sale & License Back
- Structured Products

**Advisory**
- Strategic IP Analytics
- IP VC & PE Funds
- M&A, Restructuring
- Divestment/Liquidation

**Services**
- Valuation
- License Compliance
- IP Portfolio Optimization
- Asset Management

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**IP Portfolio Management**

- **IP Portfolio Review & Categorization**
- **Portfolio Development**
- **Identification, Assessment & Acquisition of Target IP Portfolios**
- **IP Transaction Due Diligence**
- **Monetization & Commercialization Strategies**
Examples of an IP Investment Banking Player

Inflexion Point is an Intellectual Property Investment Bank

We represent technology companies and institutional investors in the acquisition and sale of patent portfolios having strategic value and in the sourcing and execution of IP-intensive M&A transactions.

From our offices in Silicon Valley, our clients worldwide rely upon us to facilitate transactions that:

- Enhance the strength of their patent portfolio as a defensive shield against litigation
- Establish freedom to operate in new technology markets
- Monetize their patents through a managed multi-stage private auction process
- Leverage the strength of their IP position in corporate M&A transactions
Examples of specifics

• Improve matching of revenues and costs through recognition of potential liabilities
• Enhance profitability forecasts that decrease potential variances between actual and expected performance
• Improve processes and control elements through a standard risk management program
• Tight documentation during the underwriting process, reducing the likelihood of an excessive patent infringement damages award
• Manage risk transfer of excessive liabilities related to patent infringement assertions
• Deter “patent trolls” considering litigation

IP investment banking services can help improve the enterprise’s profitability, market value & returns on capital
IP Portfolio Management

- **IP Portfolio Review & Categorization**
- **Portfolio Development**
- **Identification, Assessment & Acquisition of Target IP Portfolios**
- **IP Transaction Due Diligence**
- **Monetization & Commercialization Strategies**

Managing the Commercial Risks

- Seed Funding
- **Commercialization Funding**
- Working Capital
- PHASE 2A Early Commercialization
- PHASE 2B Growth Phase Expansion
- PHASE I Start-up phase R&D

- This initiative will focus only on this phase 2A/B to minimize the commercial risks faced by investors in the “go to market” phase of the R&D life cycle.
- Technology screening for the purpose of pooling together of the underlying asset class & robust commercialization will be critical.
Key Issue: What are the determinants of strategic performance?

Going to market more efficiently, faster leading to higher licensing revenue & sales

Securing Returns on Invested Capital (ROIC)

Increase investor confidence increased funding

Economic and Intellectual Capital Drivers

• Research innovation must be market driven
• Technology push (instead of market pull) could also work – but it all depends on the GTM (“go to market” strategy execution
• Intellectual capital investment must be optimized – all about yield
• Strategic IPR management is a key lever

Business and Legal Levers and Enablers

• Legal and regulatory structure will impact market
• Value creating opportunities is a function of industry economics and market readiness & opportunities
• Business scalability must be ensured

Understand drivers, levers and enablers in the value chain

Part 4
Legal Issues
Strategic Licensing Approach – **Structuring**

- **Licensor**
- **Licensees**
- **Structure**
- **Draft Agreements**
- **Negotiate**
- **Execute**

**To optimize royalties & fees, consider:**
- Downstream use of technology and IPR
- Integrate FTO & CTI (e.g., competitor patent portfolio)

**Licensing**
- Sale of product & services

**Monitor Compliance of Licensing terms**

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Strategic Licensing Approach – **Draft Agreements**

- **Licensor**
- **Partners**
- **Licensees**
- **Structure**
- **Draft Agreements**
- **Negotiate**
- **Execute**

**Types of Agreement**
- Joint Commercialization Agreement
- Strategic Alliance Agreement
- Supply Agreement
- Distribution Agreement
- Material Transfer Agreement

**Licensing**
- Sale of product & services

**Monitor Compliance of Licensing terms**
Key Licensing Agreement Terms

1 Scope of Agreement
   1.1 Subject
   1.2 Field of Use
   1.3 Territory

2 Intellectual Property Matters
   2.1 Exclusivity
   2.2 Special Provisions for Collaboration Agreements
   2.3 Maintenance and Enforcement of Patents
   2.4 Special Provisions for Agreements With IT Providers

3 Authorized Users of Licensed Rights

4 Payment Arrangements
   4.1 Upfront Payment
   4.2 Milestone Payments
   4.3 Equity Investment
   4.4 Royalties

5 Warranties, Indemnities, Limitation of Liability

6 Enforceability

7 Term and Termination Provisions
   7.1 Rights on Termination
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