ITM515 STRATEGIC TECHNOLOGY MANAGEMENT

Chapter 9

Protecting Innovation

Prof. Hakyeon Lee
(hylee@seoultech.ac.kr)

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Overview

- Firms must decide *whether* and *how* to protect their technological innovations
  - Protecting innovation helps a firm retain control over it and appropriate the rents from it
  - However, sometimes *not* protecting a technology is to the firm's advantage
    - ✓ It may increase its rate of diffusion
    - ✓ It may increase its likelihood of rising to the position of dominant design

Appropriability

Concept of appropriability

- The degree to which a firm is able to capture the rents from its innovation
- Determined by how easily/quickly competitors can copy the innovation
  - ✓ The nature of the technology itself
  - ✓ The strength of the mechanisms used to protect the innovation

Sources of appropriability

- Inherently difficult to copy
  - ✓ Based on unique prior experience or talent pool
  - ✓ Tacit (cannot be readily codified into documents)
  - ✓ Socially complex (can arise through complex interactions between people)
- Legal protection for intellectual property: Patents, Trademarks, Copyrights, Trade secrets

Patents, Trademarks and Copyrights

➢ Intellectual Property Rights (IPRs)

- Patent: protects an invention
- Trademark: protects words or symbols
- Copyright: protects an original artistic or literary work

➢ Example: MacBook

- Patent: component design, embedded technologies
- Trademark: "MacBook"
- Copyright: software

Patents, Trademarks and Copyrights

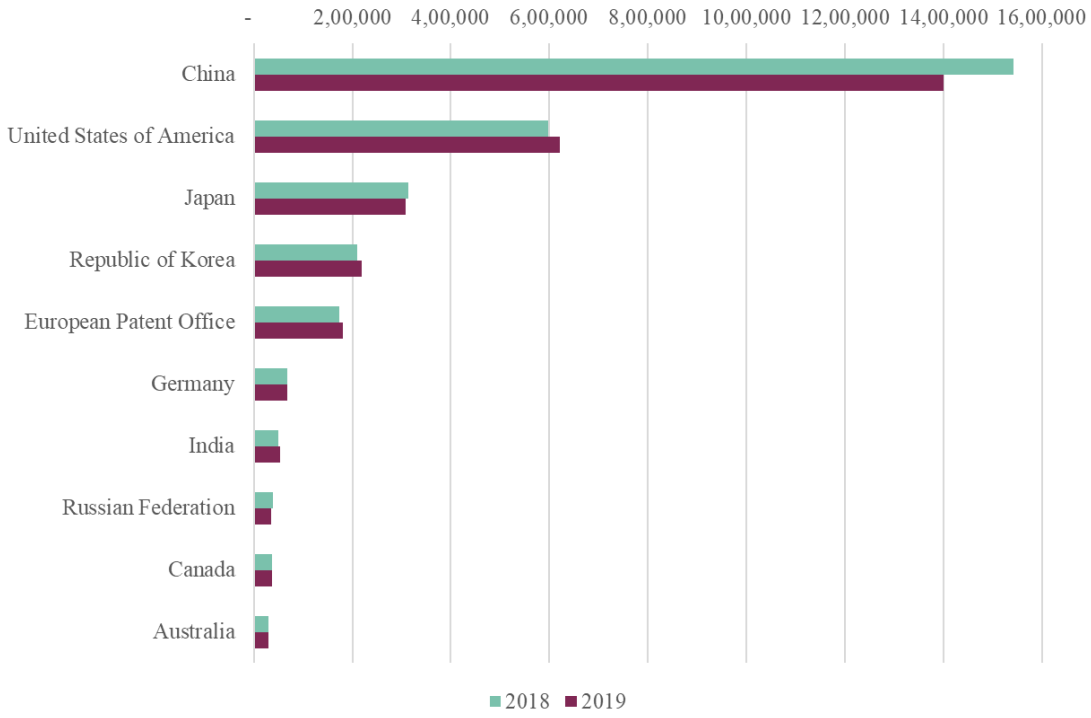
➢ Patents

- Definition: Rights granted by the government that excludes others from producing, using, or selling an invention
- Types (U.S.)
  - ✓ Utility patents: Protect new and useful processes, machines, manufactured items or combination of materials
  - ✓ Design patents: Protect original and ornamental designs for manufactured items
  - ✓ Plant patents: Protect distinct new varieties of plants
- Requirements
  - ✓ Useful: Produce a desirable result, solve a problem, improve on or propose a new use for an existing development
  - ✓ Novel: Not already be patented or described in public literature, or be in public use
  - ✓ Not be obvious: Not be expected to achieve the same invention with a normal amount of effort

Patents, Trademarks and Copyrights

➢ Patents

- Patenting
  - ✓ The patent process can take 2-5 years
  - ✓ A number of costs are involved in filing and maintaining a patent
  - ✓ Almost every country assigns a protection term of 20 years to utility patents



Patents, Trademarks and Copyrights

- Major international patent treaties
  - Territoriality of patent protection
    - ✓ A patent granted in one country does not provide protection in other countries
    - ✓ Countries have their own laws regarding patent protection
  - Paris Convention for the Protection of Industrial Property
    - ✓ An international treaty adhered to by 177 countries
    - ✓ Foreign nationals can apply for the same patent rights in each member country as that country's own citizens
    - ✓ Provides right of "priority" – once inventor has applied for protection in one member country, they can (within certain time period) apply for protection in others and be treated as if they had applied on same date as first application
  - Patent Cooperation Treaty (PCT)
    - ✓ An inventor can apply for patent in a single PCT receiving office and reserve right to apply in more than 150 countries for up to 2 ½ years
    - ✓ Provides the inventor with the option to apply for multiple nations later without committing the inventor to the expense of those multiple applications
    - ✓ Makes results of patent process more uniform

Patents, Trademarks and Copyrights

➢ Trademarks and Service Marks

- Definition
  - ✓ Trademark: A word, phrase, symbol, design, or other indicator that is used to distinguish the source of goods form one party from goods of another
  - ✓ Service mark: A trademark for a service product
- Features
  - ✓ Can be embodied in any indicator for the five senses other than visuals
    - – Visual (words, pictures, slogans, etc.)
    - – Sound (e.g. tones that are associated with a particular company or brand)
    - – Smells (as in fragrance)
  - ✓ Rights are established in legitimate use of mark; do not require registration
- Advantages of registration
  - ✓ Providing public notice of the registrant's claim of ownership over the mark
  - ✓ Must be registered before suit can be brought against an infringement
  - ✓ Can be used to establish international rights over trademark

Patents, Trademarks and Copyrights

➢ Trademarks and Service Marks

- Major international trademark treaties
  - ✓ Nearly all countries offer some form of trademark registration and protection
  - ✓ Two treaties simplify registration of trademarks in multiple countries
    - The Madrid Agreement Concerning the International Registration of Marks
    - The Madrid Protocol
  - ✓ Countries that adhere to either (or both) are part of the Madrid Union (104 members)
  - ✓ Any citizen in a Madrid Union country can register with the trademark office of that country and obtain an international registration in other Union countries

Patents, Trademarks and Copyrights

➢ Copyright

- Definition
  - ✓ A form of protection granted to works of authorship of original literacy, dramatic, musical, artistic, and certain other intellectual works
  - ✓ Prevents others from producing or distributing the work
- Features
  - ✓ Copyright is established in first legitimate use
  - ✓ Work that is not fixed in a tangible form of expression is not eligible
  - ✓ "Doctrine of fair use" stipulates that others can typically use copyrighted material for purposes such as criticism, new reporting, teaching, research, etc.
  - ✓ Registration is required for earning royalty or before an infringement suit
  - ✓ Copyright lasts for the author's life plus 70 years
- Copyright Protection around the World
  - ✓ Most countries offer copyright protection to both domestic and foreign works
  - ✓ Berne Union for the Protection of Literary and Artistic Property

Trade Secrets

- Definition
  - Information that belongs to a business that is generally unknown to others
- Features
  - Protects proprietary product or process without disclosing detailed information
  - Enables broad class of assets and activities to be protectable
    - ✓ e.g. recipes, product designs, marketing strategies, manufacturing process, customer list, etc.
  - Can be protected permanently as long as it is not disclosed
  - Cannot be protected anymore if another firm achieve success in developing the same technology as the trade secret in a right way
- Requirements
  - It must not be generally known or readily ascertainable through legitimate means
  - It must offer economic advantage to the firm that is contingent upon secrecy
  - Trade secret holder must exercise reasonable measures to protect its secrecy

The Effectiveness and Use of Protection Mechanism

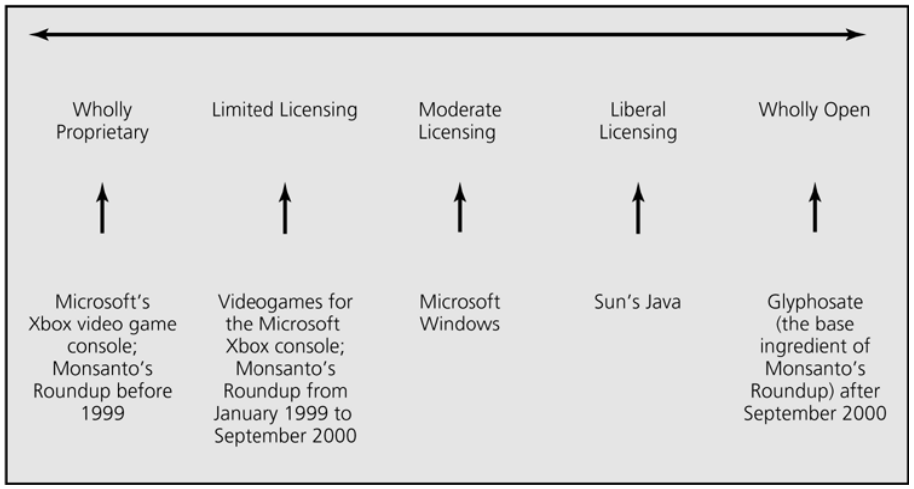
➢ Protection or Diffusion

- Protection mechanisms and their effectiveness are industry specific
  - ✓ In pharmaceuticals, patents are powerful
  - ✓ In electronics, they might be easily invented around without infringement
- If patents provide little protection, the firm may rely on trade secrets
  - ✓ The effectiveness of trade secrets also varies with the type of technology and the industry context
  - ✓ A firm must be able to expose its product without revealing the underlying technology
- In some situations, diffusing a technology may be more valuable than protecting it
  - ✓ Firms may liberally diffuse technologies through open source software or liberal licensing arrangements to establish their technology as the dominant design
  - ✓ Firms may lose the opportunity to capture monopoly rents and may not be able to regain control of the technology in the future

The Effectiveness and Use of Protection Mechanism

➢ Wholly Proprietary Systems vs. Wholly Open Systems

- Wholly proprietary systems
  - ✓ Based on company-owned technology protected by patents or some other means
  - ✓ Legally produced or augmented only by their developers; thus, generally not compatible with other manufacturers' products
- Wholly open systems
  - ✓ Based on available standards or freely distributed technology
  - ✓ Freely accessed, augmented and distributed by anyone; thus, quickly commoditized and offer little opportunity to appropriate rents



Advantages of Protection and Diffusion

➢ Advantages of protection

- Offering greater rent appropriability, and giving developers greater incentives to invest in technological development, promotion and distribution
  - ✓ A firm may adopt a penetration pricing strategy, advertise aggressively or subsidize the production of complements to rapidly build its installed base
- Enabling the firm to retain architectural control over the evolution of the technology and complements
  - ✓ Architectural control: the ability of a firm to determine the structure, operation, compatibility, and development of a technology
  - ✓ Architectural control is very valuable when compatibility is important.
    - The firm can ensure that technology is compatible with its own complements
    - The firm can restrict its compatibility with the complements produced by others

Advantages of Protection and Diffusion

- Advantages of diffusion
  - Accruing more rapid adoptions
    - ✓ If multiple firms are supporting a technology, the technology's installed base may accumulate much more rapidly
    - ✓ Competition among producers may drive the price down
    - ✓ Customers and complementary goods perceive the technology as better
    - ✓ e.g. Google's Android
  - Benefiting from the additional development efforts of other parties without additional cost to the original developer
    - ✓ Making the source code freely available leads the technology to reap the advantages of having larger pool of talent and resources
    - ✓ e.g. UNIX, Linux, R

Advantages of Protection and Diffusion

- Factors in deciding whether and to what degree the firm should protect its innovation
  - Production capabilities, marketing capabilities, and capital
    - ✓ Can firm produce the technology at sufficient volume or quality levels?
    - ✓ Are complements important? Are they available in sufficient range and quality? Can the firm afford to develop and produce them itself?
  - Resources for internal development
    - ✓ Can the firm improve the technology well enough and fast enough to compete with others?
  - Control over fragmentation
    - ✓ How important is it to prevent the technology from being altered in ways that fragment it as a standard?
  - Incentives for architectural control
    - ✓ How valuable is architectural control to the firm? Does it have a major stake in complements for the technology?