CS207 #7, 9 Nov 2012

Gio Wiederhold
Hewlett 103
Homepage at
https://cs.stanford.edu/wiki/cs207/Main/HomePage
Syllabus:

1. Why should software be valued?
3. Open source software. Scope. Theory and reality
4. Market value of software companies.
5. Intellectual capital and property (IP).
6. Life and lag of software innovation.
7. Sales expectations and discounting.
8. Alternate business models.
10. Patents, copyrights, and trade secrets. Licensing
11. Separation of use rights from the property itself. Taxhavens
12. Risks when outsourcing and offshoring development.
13. Effects of using taxhavens to house IP.
Lag conclusion (snake in the grass)

Lag is the effective development period

Has a large effect on early valuations

1. No income during that time

2. A chance for others to overtake you

*We assumed a lag of 2 years in the examples.*

Depends on product development strategy

\[
\text{Effective lag} = \text{Development period} \times \text{Centroid fraction}
\]
IP Protection

• Intellectual Capital
  all intangibles that contribute to non-routine returns
  ➢ People: “Operational capital” hard to protect
  ➢ Intellectual Property
    ▪ Should be protected against misappropriation
      a) Patents
      b) Copyright
      c) Trade Secret
    ▪ All can be
      o Sold gone to someone else
        • if you cannot use them profitably
      o Licensed specified rights to the IP box are rented
        • Sales of a product in Europe, Japan
Overview IP protection

1. Patents
   - Use only if the invention is visible in the product
   - Or use to hinder others .... “blocking patents”

2. Copyright
   - Protects source code and chip masks
   - Not the underlying ideas

3. Trade Secret
   - If it can be kept secret, best choice
   - Must be defended: NDAs, action when violated
1. Patents

1. Device patents
   • Good for visible ideas
   • Headlights built into fender (Pierce Arrow ~1918)

2. Materials patents
   ▪ Analyzable stuff
     o Glue, drugs,

3. Business patents
   ▪ hard to assure that they represent new findings
     o Grand Fishery of Great Britain (1720): ocean fishing – rejected
     o Wireless Electronic Mail (NTP versus RIM [Blackberry], Nokia, suing Palm)


Limits to patents

• Genes
  ▪ Recent ruling overturns patentability

• Stemcell: EU Court of Justice, said the use of human embryos ‘for therapeutic or diagnostic purposes which are applied to the human embryo and are useful to it is patentable. But their use for purposes of scientific research is not patentable.’

case was Re: Greenpeace versus Oliver Brüstle, Director of the Institute of Reconstructive Neurobiology at Bonn University, whose research in turning embryonic stem cells into neural cells for treating Parkinson’s disease.

• Business Methods
Sharing Sound, which holds an actual, government-approved patent. Improbably issued in 2001, Sharing Sound’s absurdly broad patent covers “distribution of musical products by a web site vendor over the internet.”

Actually: specifically includes the generation of a user-specific key that is inserted into the music file at the time of purchase and used in conjunction with keys on the user’s computer to verify authorization. The inventor was Bernhard Fritsch, whose short-lived MCY.com music service launched in early 1999 does appear to have been the first to employ this type of system. Sold the patent to Sharing Sound, instead of creating a product or service with the patent, Sharing Sound lied in wait and finally in May 2010 filed patent infringement lawsuits in the U.S. District Court for the Eastern District of Texas against Apple, Sony, Microsoft, Rhapsody, Brilliant Digital Entertainment (BDE) and Napster, and separately also sued Amazon, Netflix, Barnes and Noble, Wal-Mart, and GameStop. The patent (here is a good summary of it) essentially describes how these companies sell music online. Other than BDE, all of the companies have reportedly settled, the latest being Apple and Rhapsody. But online selling of digital goods was well underway before the Patent Office issued the Sharing Sound patent.

The terms of the settlements remain private, Sharing Sound no doubt kept its monetary demand below the defendants’ anticipated cost of litigation.

[Glenn Lammi: The Legal Pulse; Washington Legal Foundation, 2010 & comments]
Patent bundles

• Many – 100’s – patents are needed for many modern products.
• Negotiating with all the patent owners is much work and leads to costly total royalties ► 20% of cost of GSM phone
• Alternative – standard-specific patent organization ► UMTS for 3G
  1. Bundles all patents needed for a standard,
  2. Collects a global royalty from all manufacturers
  3. Reimburses all patent owners – keeps say 6%

  Historical model: U.S. aircraft industry at the start of WW II
  without a patent pool no manufacturer could build good planes
• Bundles also used to negotiate among companies
• Still threatened by patent trolls
  ► Costs for a legal defense are huge, often companies just give up
    o Pay-up for a license.
    o Devise a work-around

East Texas district court
2. Copyright

Often changed, last major changes 1978, 1990

• grants very long period: 120 years or

  70 years after the death of the author

was 28 years but renewable another 67 years
Copyright

• To defend your work you must show the violation
  ➢ Substantial code must match precisely
  ➢ Automatically derived code is protected as well
    ▪ Binary versions are protected, even if they differ
    ▪ Changes of variable names don’t invalidate copyright
    ▪ Damage awards depend on loss sustained

• Recoding the embodied concepts is not protected
  ▪ Feasible for well defined tasks
  ▪ Difficult for large, diverse code
    ○ Fujitsu IBM case
Trade secret

• Origin in Roman law: *Actio servi corrupti*
  ▪ Bribery, kidnap of servants/slaves to divulge secrets
  ▪ Guilds in the middle ages protected their secrets
    » watchmaking, black-cloth dying,

• Also applies to marketing schemes

• Supported by Agreements +for company / +for employee?
  ▪ Non-disclosure agreements
    o Employees, Consultants, Contractors, Customers, Tax officials
  ▪ Invention assignment agreements to cover
    o Invent for hire, invent using resources, invent independently
  ▪ No-compete agreements (limits differ by state: CA↓ MA↑)
    o Even covering one’s own inventions, but not routine knowledge
    o Are limited in time (3 months to 3 years), but deceit is a violation

• Must be defended when a violation is known
There is at least one type of trade secret that is recognized by federal law:

• Exclusive access for 4 or 12 years to
  • Small molecules • biological material

the `sponsor’ of IP material collected for

➢ Clinical trial data
➢ Software to design drugs
➢ Drug-making processes
➢ Software to control drug-making processes

Even though the information must be made available to the FDA for drug approval.
Trade secret and SW

• Reverse engineering of public SW is legitimate!
  ▪ Unless copyright is violated – masks, code
  ▪ Threats in the fine print that is ignored by most

• Getting a patent invalidates the trade secret
  ▪ Patents invite trolls

• Determining loss of trade secret is hard
  ➢ Code and Documents in hand of thief
    ▪ Often voluminous
    ▪ Having labeled documentation helps greatly
      o ‘company confidential’
      o Tracking of documents and document copying
      o Meetings in room without personal, but corporate recording

• Prosecution is hard
Employee motivation

Convey benefits to your staff and contractors

Contracts should not infringe employee mobility / betterment

- Doctrine of `inevitable disclosure’ even without a non-compete contract
- State laws differ: California supports mobility, leakage; Midwest less so
  - Dishonesty or aggressiveness on either side makes a difference. Use facts.

- Legalistic NDA forms make enforcement awkward
- Brief summary and discussion with signer should be routine
- Exceptions should be possible: student intern vis-à-vis professor
- Do not hire employees based on loyalty vs. smarts
  - Pay for loyalty commitments as well as for smarts
    - Employee should receive a comparable benefit for signing a restrictive covenant, arrange such a parachute at hiring, don’t wait for the termination.
Protecting trade secrets

Covers majority of IP value in modern companies

• Period of usefulness is limited in practice
  ➢ . . . but adequate given its simplicity versus patent, copyright

• Reasonable practice is hard to convey
  ➢ Contracts should not infringe employee mobility / betterment
    o Doctrine of `inevitable disclosure` even without a non-compete contract
    o State laws differ: California supports mobility, leakage; Midwest less so
      » Dishonesty or aggressiveness on either side can make the difference. Use facts.
  ➢ Legalistic NDA forms make enforcement awkward
  ➢ Brief summary and discussion with signer should be routine
  ➢ Exceptions should be possible: student intern vis-à-vis professor

• Do not hire employees based on loyalty vs. smarts
  ➢ Pay for loyalty commitments as well as for smarts
    ▪ Employee should receive a comparable benefit for signing a restrictive covenant,
      arrange such a parachute at hiring, don’t wait for the termination.
Selling IP +

Bundling & valuing the box

1. Piece by piece or
2. Tranche of the company – say, all sales in Europe
3. Can include available knowhow (+) for maintenance

1. Package the box
   ➢ Create a subcorporation to hold the rights to the IP+

2. Sell the subcorporation to European sales co.: SE
   1. Receive a single payment matching the value
      ▪ Requires a well-off buyer
   2. Receive payments over time of equivalent NPV
   3. Make a royalty (fraction of SE’s sales) arrangement
      1. A fraction of sales at SE commensurate with the amount of IP
      2. A period that is sufficiently long to recover the IPs NPvalue
      3. A premium to compensate the seller for the risk of SE defaulting
Say you want to delegate sales in Europe to some company EUsales that can do it easier over there

• How do you set the fees or royalties?
  
  1. You have computed a value of your SW of $1M
     ▪ But without discounting, it is actually $1.6M = Σ(due old, slide 5)
     ▪ You will also maintain the SW 1.36M = Σ(maintenance cost, slide 12)

   The total due is $3M

  2. You expect the European sales will be 40% of total, 20 000
     ▪ The reason for not discounting is that funds arrive at the same times.

• To earn the same you should charge \( \frac{1}{2} \cdot \frac{1}{2} = \$150 \)/unit
  ▪ It does not matter how EUsales sells it and what it charges
  ▪ Complexities are required language, interface improvements
Rights are flexible

These rights can then be moved off-shore. Income from these rights can avoid taxes. Even easier to do with intellectual property. And invisible – not on corporate books.
1. A US company, $USco$ needs cash. It owns a splendid HQ building

2. $USco$ may sell its HQ building to a real-estate enterprise $REco$ with a provision that the $REco$ will lease the building back to $USco$.

3. If $USco$ has received a fair value for the building, $USco$'s total tangibles remain unchanged until it spends the money it received.
   - $REco$ may offer an attractive lease because of tax advantages.

4. Actually, $REco$ can be set up by $USco$ and controlled by $USco$, which also remains its only tenant.

5. Nobody moves and few employees will notice a change.
   - There is a new brass plaque on the building
   - A sign `$REco$' on the door to the rooms housing the people who maintain the HQ.
   - The public consolidated annual report of $USco$ only lists the name and location of the controlled subcorporation $REco$; the assets of both are combined.

6. Since the lease receipts at $REco$ and payments by $USco$ are similar, the more complex financial flow is invisible.
Internal sale for intangibles

Procedure functionally identical to tangible example, but

• Even less visible
  ▪ IP transactions are harder to value than buildings

• IP is a much larger fraction of corporate value than HQ

• The consumers of the IP are the sales organizations
  ▪ Not the tenants

• Typically involves three or more entities
  1. Parent company, creator, or sponsor
    ▪ Creates and maintains the IP
  2. IP holding company, often in a tax haven
    ▪ Buys IP initially and pays for its maintenance. Licenses its use.
  3. IP consumer: selling company
    ▪ Buys license to use the IP in products it sells, pays royalty to IP holder
  4. Off shore IP generators \[\Rightarrow\] more to come
Offshoring

Task transfer to Enterprises in Foreign countries

Two aspects:

1. Work migration: jobs are moved to lower-cost countries

2. Support software etc. is moved to enable similar productivity in those countries

Income is generated by people and (intellectual) capital
Hypothesis

• Offshoring of jobs is effective because of concurrent Intellectual Property (IP) transfer
• Much of that IP is corporate property
• Transfer of corporate IP is poorly understood
  ➢ IP as property is not well defined, hard to measure
  ➢ There are many components to IP, coming from
    ▪ open source, R&D, marketing, reputation as
    ▪ Patents, copyright, trade secret (covered by NDAs)
• Still, IP transfer is a valuable, significant export
Types of Foreign Entities

• **Independent Foreign Contractors**
  - IFC may serve multiple customers
    - Share trade secrets with competitors
  - Owners need contracts to protect the IP
    - Hard to monitor and enforce

• **Owned, Controlled Foreign Corporations**
  - CFC provides much more control over IP
  - Ownership often in third-party countries
    - Avoids **taxation** of sales to other countries
Knowledge is the Link

To be effective a **worker** has to know what has to be done

- That knowledge consists of
  - **The technology**
    - Documentation, prior versions, quality control
  - **The business methods**
    - How technology in the product is marketed
    - The flow from buyers to improved products and methods

- Companies distinguish themselves by proprietary IP
  1. Patents, sometimes Copyrights
  2. Confidential Documents
  3. Knowledge within its people - protected by NDAs

- call center employees • technicians
  • engineers • managers