CS207 #7, 8 Nov 2013

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

Drafts of reports received by 15Nov13 will receive feedback by 25Nov13.

Hand in make-up reports now.
All are due 25Nov13
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.
Report for class

• It’s all on the webpages, and some earlier class notes

• I care about content:
  1. problem
  2. how treated [Literature] or not, your observation
  3. critique
  4. solution
  5. Conclusion – relating to 1

• Not form- spacing, font, length
Discussion

• Ron Burbback
• CS PhD and Patent consultant
• His slides follow, and there will be some duplication
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**
   - Federal Law
   - Use only if the invention is visible in the product
   - Or use to hinder others ... “blocking patents”

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

3. **Trade Secret**
   - State law
   - 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
     - Glue, drugs,

3. Business patents
   - hard to assure that they represent new findings
     - Grand Fishery of Great Britain (1720): ocean fishing – rejected
     - 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
Patent troll instance?

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, SEP patents
  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

Differs by country, although ongoing harmonization even when laws are the same, expectations differ

Often changed, last major US changes 1978, 1990

• grants very long period: 120 years or
  70 years after the death of the author

was 28 years in the U.S. 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
    ○ Worked for IBM PC BIOS → (COMPAC, now HP)
  ▪ Difficult for large, diverse code
    ○ Fujitsu IBM case for OS370 (base OS 360 was not protected)
      » Used a clean room, but did not succeed, had take a license out.
3. 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
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 important
• 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.
    ▪ New hires should arrange a parachute (payment for not divulging secrets) at hiring
      don’t wait for the termination.
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.
Convey benefits of keeping secrets 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 in court. 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
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
    - 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 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.
Intellectual Property

Patents, copyright, trademarks, and trade secrets
Stanford University
Ron Burbach
November 2013
• Patents
  ➢ Take a detailed look at the Google (Larry Page) page rank patent to introduce the concepts of a patent
    » [on line- pointer in CS207 web page]
• Copyright – just a little
  ➢ doctrine of personal use (aka fair use doctrine)
• Trademarks – just a little
• Trade secrets – just a little
• Gaming the patent system
• Future direction and a proposed redesign
But first, an observation

• It is much harder to create than to understand.
• You can look really smart when someone else is feeding you all the correct answers.
• Brilliant ideas are simple to understand.

• Consider J.K. *Rowling's Harry Potter*
In the big picture of things

• Given an entity ...
  ➢ Patent: concept of the entity
  ➢ Copyright: the entity itself
  ➢ Trademark: the name or symbol representing the entity
  ➢ Trade secret: may take the form of all of the above
• Cover page
  ➢ Abstract
• Specification
  ➢ Drawings
  ➢ Description of the concept
• Claims
• More information
  ➢ USPTO.gov
ABSTRACT

A method assigns importance ranks to nodes in a linked database, such as any database of documents containing citations, the world wide web or any other hypermedia database. The rank assigned to a document is calculated from the ranks of documents citing it. In addition, the rank of a document is calculated from a constant representing the probability that a browser through the database will randomly jump to the document. The method is particularly useful in enhancing the performance of search engine results for hypermedia databases, such as the world wide web, whose documents have a large variation in quality.

29 Claims, 3 Drawing Sheets
• US Patent 6,285,999
  ➢ There are **no international patents**, just an **international application**. All patents are granted by governments (or groups of governments).

• The patent and application have been **published**.

• Dates are very important!
  ➢ Granted date September 4, 2001
  ➢ Application date January 9, 1998
  ➢ Claiming **priority** is with respect to dates and not work assignment

• Utility patent (must be useful at something)
  ➢ Other patent types include design and plant
Some famous patents

• Utility
  - Bell’s phone patent
  - Edison’s light bulb, phonograph, motion picture, ...
  - http://www.uspat.com/historical/

• Design
  - Apple’s “look and feel” of a computer interface – cropped windows
  - Apple’s ipod
  - Auguste Bartholdi’s “Liberty Enlightening The World” aka the Statue of Liberty

• Plant
  - Hass’s avocado
  - Burbank’s potato
• Inventor: Larry Page
• Assignee: Stanford University
  ➢ The assignee has all the rights
  ➢ The patent grants the **right to exclude others**.
• Title: Method for node ranking in a linked database
• Primary Examiner: Thomas Black
• **Abstract:** A method assigns importance ranks to nodes in a linked database, such as any
database of documents containing citations, the world wide web or any other hypermedia database.
The rank assigned to a document is calculated from the ranks of documents citing it. In addition, the
rank of a document is calculated from a constant representing the probability that a browser through
the database will randomly jump to the document. The method is particularly useful in enhancing the
performance of search engine results for hypermedia databases, such as the world wide web, whose
documents have a large variation in quality.
More cover sheet observations

• Because the work was supported in part by the NSF, the government has certain rights in the invention.

• Application: This application claims priority from U.S. provisional patent application Ser. No. 60/035,205 filed Jan. 10, 1997, which is incorporated herein by reference.

  ➢ Provisional application (no claims, no examination, defines priority date)
  ➢ Non provisional applications
  ➢ And many more kinds of applications
The specification is a detailed description of the invention. The invention need not be already built. Enough details that “one skilled in the art” can build the invention. The specification will form the foundation for the claims.
“Although the following detailed description contains many specifics for the purposes of illustration, anyone of ordinary skill in the art will appreciate that many variations and alterations to the following details are within the scope of the invention. Accordingly, the following embodiments of the invention are set forth without any loss of generality to, and without imposing limitations upon, the claimed invention. For support in reducing the present invention to practice, the inventor acknowledges Sergey Brin, Scott Hassan, Rajeev Motwani, Alan Steremberg, and Terry Winograd.”

- A **patent is granted for one invention** but the specification may describe many inventions.
- You get one shot at the specification. (no new matter)
Drawings

FIG. 3

START

SELECT AN INITIAL N-DIMENSIONAL VECTOR $p_0$

COMPUTE AN APPROXIMATION $p_n$ TO A STEADY-STATE PROBABILITY $p_\alpha$ IN ACCORDANCE WITH THE EQUATION $p_n = A^n p_0$

DETERMINE A RANK $r[k]$ FOR NODE $k$ FROM A $k^{th}$ COMPONENT OF $p_n$

DONE
Observations on Drawings

• All drawings are labeled “Fig. N” (as a template)
• Many rules (thickness of lines, size of text, font, ...) but these rules are easy to follow with modern graphic draw tools.
• All (or most) of the elements in the drawing are labeled.
• Since the drawings are part of the specification, you only get one shot at the drawings (except for rule violation edits). No new matter.
• What is claimed is:

1. A computer implemented method of scoring a plurality of linked documents, comprising: obtaining a plurality of documents, at least some of the documents being linked documents, at least some of the documents being linking documents, and at least some of the documents being both linked documents and linking documents, each of the linked documents being pointed to by a link in one or more of the linking documents; assigning a score to each of the linked documents based on scores of the one or more linking documents and processing the linked documents according to their scores.
Observations on Claims

• Claim 1 is an independent claim
• Claim 1 is called the planetary claim: the most general.
• Claims define the legal foundation of the patent’s rights
• Claims define one invention: “A computer implemented method of scoring a plurality of linked documents”. This is called the preamble. The specification may define multiple inventions but only one gets to be claimed per patent. There may be many sets of claims, defining many patents, based on the same specification.
• The concepts in the claims need to be grounded in the specification.
• Choice of transitional phrase
  ➢ Comprising – open ended
  ➢ Consisting – closed ended
Noun clauses are introduced as indefinite noun clauses and then, when used again, as definite noun clauses.

<table>
<thead>
<tr>
<th>a plurality of documents</th>
<th>the documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>at least some of the documents being linked documents</td>
<td>the linked documents</td>
</tr>
<tr>
<td>at least some of the documents being linking documents</td>
<td>the linking documents</td>
</tr>
<tr>
<td>at least some of the documents being both linked documents and linking documents</td>
<td></td>
</tr>
<tr>
<td>a link</td>
<td></td>
</tr>
<tr>
<td>a score to each of the linked documents</td>
<td>their scores</td>
</tr>
<tr>
<td>scores of the one or more linking documents</td>
<td></td>
</tr>
</tbody>
</table>
Claims Construction

• Markman hearing
• All noun clauses used in the claim must be grounded, by the specification or by knowledge held by one skilled in the art.
• What is a .... ?
  ➢ Link
  ➢ Score
  ➢ “pointed to”
  ➢ “assigning a score”
  ➢ “processing a document”
Claim 2

2. The method of claim 1, wherein the assigning includes: identifying a weighting factor for each of the linking documents, the weighting factor being dependent on the number of links to the one or more linking documents, and adjusting the score of each of the one or more linking documents based on the identified weighting factor.

- Claim 2 is a dependent claim.

- 29 claims, 4 independent claims, 4 claim clusters

- Claims 12 and after, were clearly added after application submission but before patent grant.
Patents concepts

- “first to invent” versus “first to file”
- Utility patent – 20 years
- Design patent – 14 years
- Plant patent – 20 years
- At the very least a utility patent will cost $3,790 (micro entity, less than 3 independent claims, less than 100 sheets of paper, filing, searching, examination, issue, and maintenance).
  ➢ $30,000 typical?
Patent concepts

• Infringement – commission of a prohibited act protected by a patent.

• Validity: A granted patent is assumed to be valid.
  ➢ The five primary requirements for patentability are:
    ➢ (1) patentable subject matter (process, machine, manufacture, or composition of matter); excluded (math, laws of physics, … )
    ➢ (2) utility – useful. (lack of utility: perpetual motion machine, curing cancer, … )
    ➢ (3) novelty
    ➢ (4) nonobviousness
    ➢ (5) enablement – one skilled in the art is able to make the patent as described in the specification and claims.

• To show invalidity need to find prior art to the patent.
  ➢ A **patent teaches art** and if the claims and their **construction read on prior art**, then the patent in invalid. Need prior art at least 1 year before application filing date. Can get an earlier date by “Swearing Back a Reference”.

Copyright

- Copyright is self declared
- The library of congress will provide a vault and a time stamp for copyrighted material.
- Poor man’s copyright protection (place copyrighted material in a sealed envelope and mail the envelope to yourself)
  - same by email?
- The doctrine of personal use (aka fair use doctrine)
  - Very generous
- Term: life of the author plus an additional 70 years
- Example of copyright in computer science
  - IBM BIOS vs Phoenix BIOS (lead to the PC market place)
  - Clean room design
  - Source code escrow
- Jaron Lanier “Who owns the future” The copyright free internet experiment of the past two decades has failed to support the creators of information.
How does a radio pay royalties on music?

- Artist registers the song with a royalty agency (ASCAP, BMI, SESAC, and SoundExchange).
- A radio keeps a play list of songs.
- Based on licensing fees one bulk payment is made to the royalty agency.
- The royalty agency then divides the money among the artist based on a weight calculation including many factors and issues a quarterly check.
Trademarks

• Managed by the USPTO
• Last as long as you renew the trademark
• Some examples
  ➢ Punch cards vs. Hollerith cards
  ➢ Xerox vs. copy
  ➢ iPhone vs. smart phone
  ➢ Google vs. search
• can also be an image or pattern
  ➢ important for customer recall
Trade Secrets

• Contract between entities such as employees and a business. NDA.
• Not disclosed to the public.
• Examples
  ➢ Google’s “real” search engine
  ➢ Coca-Cola’s recipe
  ➢ KFC’s fried chicken recipe
  ➢ WD40
  ➢ Auto tune
• Dave Cutler (from Digital) wrote the operating system for Microsoft. Based on Prism (Digital trade secret). Microsoft pays 100’s of millions.
Confusion in the patent system

• Bell and Watson vs. Gray and Edison on telephone patent 1870
  ➢ First to file, first to invent, adding new material in specification and then adding a new claim, bribes, alcoholic examiner releasing unpublished application information, after several years of interference the patent was granted to Bell because Bell produced a working prototype.

• Howe & Singer sewing machine controversy 1855
  ➢ “the sewing machine manufacturers got busily down to the job of suing each other out of existence”
Problems with the patent system

- Specification is mostly completed by the inventor. The claims are written by the patent team.
- The patent once granted is assumed valid.
- The grant of the patent is absolute (only one patent).
- Technology is moving faster and faster every day.
- About 576,000 patent applications per year. About 276,000 granted patents. About 6,242 patent examiners. About 2.5 days per application (from USPTO web site). Nearly an impossible task.
- Patent examiners knowledge is not absolute.
How to game a patent

• Keep the application open for a long time, wait and see what happens in technology, and then cut the claims and issue the patent

• Write a specification that is confusing, all encompassing, full of misconceptions, and then use that specification for support in the claims

• Issue multiple patents all with different claims

• Add new material in the abstract

• Broaden the preamble of a claim

• Broaden the claims construction

• Boxing a claim (positive vs negative links)
Patent trolls (aka gnats)

- Obtain a patent and sue for infringement on a large collection of companies (or their customers).
- Prosecute while cost of infringement defense is less than the cost of settlement, then finally settle out of court.
  - start with suing the smallest and the most vulnerable businesses for modest, affordable license fees
  - gain credibility for the patent
  - move on to larger businesses that are now willing to pay more
- The information of each case is then sealed by its settlement agreement.
Pressures on the patent office

• Technology is moving faster and faster
• Impossible to have absolute knowledge
• International patents (who grants patents in a space colony? Oceans?)
• As work loads increase, quality decreases or time delays occur
• Patents on animal life forms (complex life forms). Artificial intelligence?
• The cure (or treatment) of cancer may happen in our life times. DNA based medicine.
• Human Genes (human DNA). What about non-encoding DNA? RNA? The DNA of the mitochondria?
Some suggested changes

• Patents, Copyright, and Trade Marks should be self declared. Get the patent office out of the business of granting validity.

• The patent office becomes a provenience holding site; allowing for publication and time stamps; define spheres of information influence and importance.

• A special court is defined to handle intellectual property issues. Court information is made public.

• A royalty payment system some what like radio royalty system is put in place.

• International

• Generous doctrine of personal use for all three.

• Consistent terms (lifetimes)
Thank you

- Recall: It is much harder to create then to understand.
- We need a system in place to fund and support creation of new concepts while at the same time allowing for generous public use.

- Questions?