Chap 4. Intellectual Property (IP): A Key Resource in Technology Entrepreneurship

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The Four Key Forms of Intellectual Property (IP)

- Patents
- Copyright
- Trademarks
- Trade Secrets

Patents

Patents are often the first thing that scientists or engineers think of when dealing with intellectual property.

- Patents
  - A patent is a grant from the federal government conferring the rights to exclude others from making, selling, or using an invention for the term of the patent as many as 20 years.
- To obtain a patent, an invention must:
  - Be **novel**
    - It must be something that is completely new. If others have done it before and disclosed that, then it cannot be patented.
  - **Not be obvious** to a person of ordinary skill in the field
    - This is often the point around which patents disputes start. If one can show that an idea would be obvious to anyone skilled in the field then it cannot be patented. Sometimes that can be in heavy dispute.
  - Be **useful**
    - You cannot patent something that does not have an obvious immediate use.

Three forms of patent protection

There are three basic forms of patent protection that are each designed to do something a bit different.

- The Utility Patent:
  - Duration is 20 years from the date of the original application.
  - It is awarded for any new or useful process, machine, manufacture, or composition of material or any new and useful improvement thereof.
- The Design Patent
  - The duration is 14 years from the date the patent is awarded.
  - It is awarded to protect the invention of a new, original, and ornamental design for manufactured products.
- The Plant Patent
  - The duration is 20 years from the date of the original application
  - It protects any new varieties of plants than can be reproduced asexually.

What Can You Patent?

You can patent any:

- Process
- Machine
- Manufacture
- Chemical formula
- Design
- Plants

The Business Method Patent –had a short lifetime

In 1998, a Federal Court ruling assigned the US Patent and Trademark Office (USPTO) with the responsibility of issuing patents for unique **automated technologies** that process data or generate revenue (i.e. business models, methods, processes—including computer software).

Suddenly, e-commerce features such as subscription-based access, targeted advertising networks, portal sites, online auctions, virtual malls, and even forums were now considered business models, methods, and processes that could be patented.

The Business Method Patent had become a very important form of patent in the eCommerce and other internet mediated business interactions. A business method patent was a patent that protects an invention that is or facilitates a method of doing business.

- This included new types of e-commerce, insurance, banking, tax compliance etc.
  - This is a relatively new type of patent and continued to be the subject of controversy and litigation until the "Alice Decision" nearly invalidated it.
- Here are a few important examples:
  - Amazon.com's one-click ordering system,
  - Priceline.com's "name-your-price" business model
  - Netflix's method for allowing customers to set up a rental list of movies to be mailed to them.

Some areas of Business Method Patents in the past

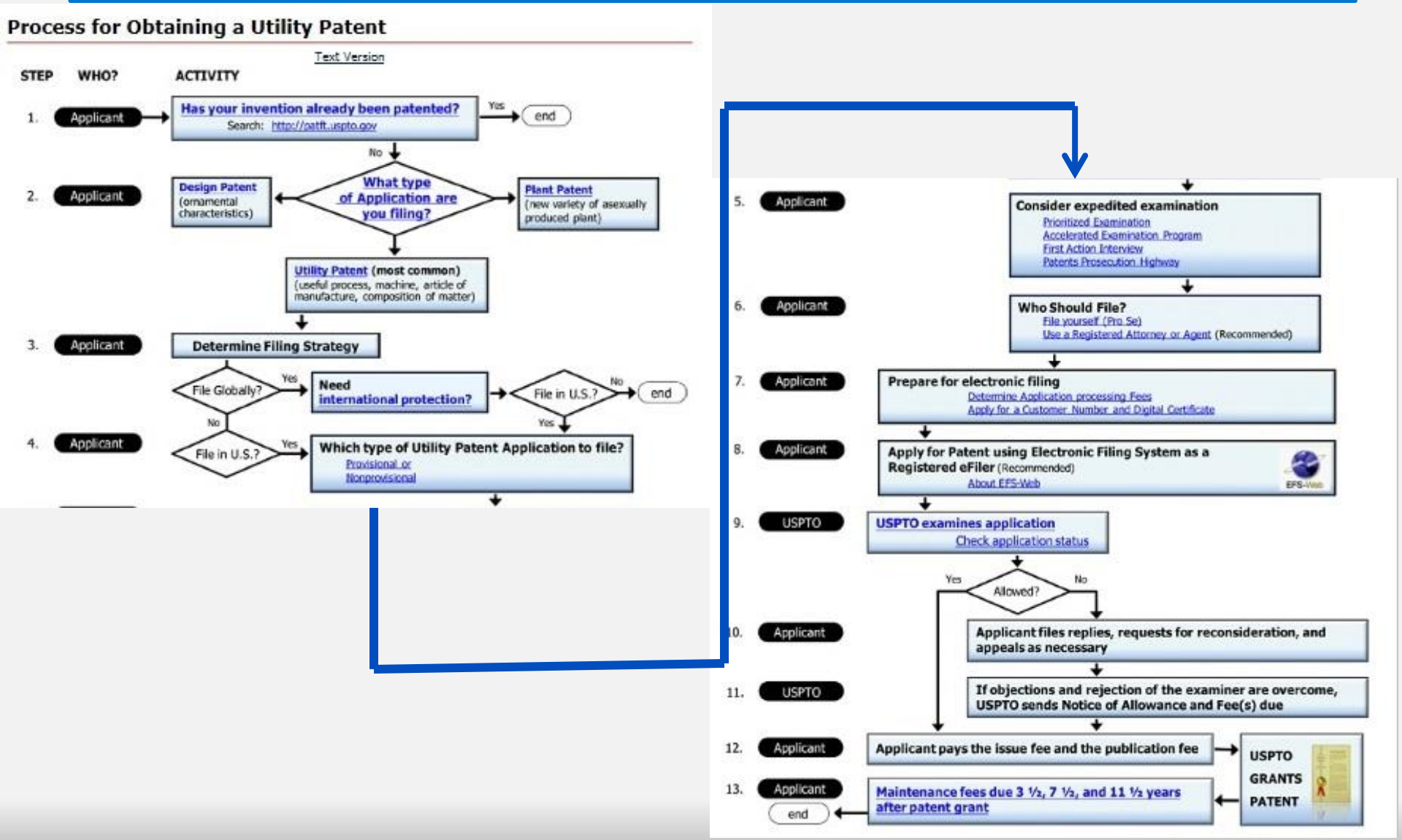
- Financial - credit and loan processing, point of sale systems, billing, funds transfer, banking clearinghouses, tax processing, and investment planning
- Financial instruments and techniques – derivatives, valuation, index-linking
- Optimization – scheduling and resource allocation
- Marketing - advertising management, catalog systems, incentive programs, and coupon redemption
- Information acquisition, human resource management, accounting, and inventory monitoring
- e-commerce tools and infrastructure – user interface arrangements, auctions, electronic shopping carts, transactions, and affiliate programs
- Voting systems, games, gambling, education and training
  - http://eml.berkeley.edu/~bhhall/papers/BHH%20on%20BMP%20May03WP.pdf

And then “Alice” Happened

- *“Ever since the U.S. Supreme Court’s 2014 Alice decision, the U.S. courts and the U.S. Patent and Trademark Office (USPTO) have consistently held that you can’t patent a business method by itself. The Alice decision overturned several related business method patents as being nothing more than an attempt to patent a fundamental economic process. Lower court decisions have since affirmed that “no matter how groundbreaking, innovative or even brilliant” a business method might be, you still can’t patent it. The only way to use patents, therefore, to protect business method inventions, is to patent the technological inventions required to make the business methods work.”*
  https://www.ipwatchdog.com/2019/09/03/want-protect-business-method-reframe-technical-invention/id=112875/

- Alice Decision: “*Applying this two-part test, the Alice decision held that known ideas are abstract, and reciting the use of a conventional computer in the claims to implement the known idea does not make the claim patentable subject matter. Alice has greatly impacted the litigation of software patents. Alice also gave defendants a new and highly successful defense that could be asserted early in litigation. In turn, patentees have had to take this new defense into account in their litigation strategy, and companies have questioned the value of software patents.*”
  In the courts: five years after Alice - five lessons learned from the treatment of software patents in litigation (wipo.int)

USPTO Patent Process- http://www.uspto.gov/patents/process/



Advantages to patents

There are some definite advantages to having a patent

- Provides a monopoly right for the life of the patent
- Raises the cost of imitation
- Helps to raise capital by demonstrating competitive advantage
  - Investors like to see that the intellectual property behind a new venture is protected so that someone else cannot come along and easily enter the same market.
- Prevents a second party from using the invention as a trade secret
- Cross-licensing (with potential royalties or joint profits)

Disadvantages of patents

- Requires disclosure of the invention
  - This means that others can see how you did it.
- Provides only 14-20 year monopoly
  - When a drug goes off patent, then the generic imitations quickly eliminate the original market.
- Can be circumvented
  - By looking at your disclosure, a competitor might find a way to invent around your patent.
- Difficult and costly to defend
- Less effective for most types of technology
  - Can be irrelevant if technology is fast moving
- Requires world-wide patent application
  - And the rules are different, and the process is costly, but failure to do so means that you may lose the market in that country.

Remember that it is more costly to defend and enforce a patent than it is to obtain a patent.

Apple Design Patents

- Jan. 5, 2007: Apple files for 4 design patents covering the basic shape of the iPhone a mere four days later, Apple releases the IPhone to the public.
- June 2007: Apple files color design patents covering 193 screen shots of graphical user interfaces for the iPhone.
- April 15, 2011: Apple sues Samsung for infringement based upon these patents, some utility patents, registered trademarks and trade dress rights.
- Samsung counter sued in both Korean and Japanese courts
- Apple sued in German (EU), Dutch, and Australian courts.
- Samsung sued in Italian, British, and French courts.
- There were then quite a few conflicting decisions that barred sales of Apple in some jurisdictions and Samsung in others.

- August 24, 2012: A U.S. Court the jury returned a verdict largely favorable to Apple.
  - It found that Samsung had willfully infringed on Apple's design and utility patents and had also diluted Apple's trade dresses related to the iPhone.
    - It had infringed: home button, rounded corners, tapered edges, bounce-back effect, tap to zoom, and on screen navigation.
  - The jury awarded Apple $1.049 billion in damages and Samsung zero damages in its counter suit
- October 23, 2012, U.S. Patent and Trademark Office invalidated Apple's bounce back patent
- For those interested in the detailed history please see the Wikipedia entry at: https://en.wikipedia.org/wiki/Apple_Inc._v._Samsung_Electronics
- To make a long story short, the two companies continued to spar and try to ban one another's product –with some partial successes over the next three years.

Dénouement

- Reuters: Andrew Chung; NY; Dec 4, 2015 12:00pm EST
- **Samsung to finally pay Apple $548 million in patent dispute**
  - http://www.reuters.com/article/us-apple-samsung-payment-idUSKBN0TN20R20151204

"The payment comes after a U.S. appeals court last May reduced a $930 million judgment against Samsung by $382 million, stemming from a 2012 verdict for infringing Apple patents and copying the look of the iPhone.

Another trial over remaining damages relating to some of Samsung's infringing products in the case is set to go ahead next spring.

Even though the U.S. Court of Appeals for the Federal Circuit in Washington, D.C. had authorized damages to Apple in May, Samsung again appealed the final figure to the same court, and was rebuffed twice more.

Now agreeing to pay, Samsung told the San Jose court that it expects to be reimbursed if it eventually succeeds in a forthcoming appeal to the U.S. Supreme Court over its liability for copying the patented designs of the surface, bezel and user interface of the iPhone, which accounted for $399 million of the total award.

South Korea-based Samsung also said it reserved the right to be reimbursed in the future if a decision by the U.S. Patent and Trademark Office invalidating one of the Apple patents in the case, related to touchscreen gestures, is upheld.

Apple intends to appeal that ruling and said in court documents it "disputes Samsung's asserted rights to reimbursement."

Patents are useful, but they require vigorous defense

- The moral of the story: Patents are not that hard to obtain, but they are very difficult to defend.
- It often costs far more to defend a patent than to obtain a patent.
- In this case it was two large companies with very deep pockets doing the fighting
- If you are a small company fighting back against a big company, it is usually difficult to do.
- Large companies sometimes infringe a patent, knowingly or not, and then rely on their extensive legal teams and deep pockets to keep doing what they are doing as the case works its way through court or the smaller company settles to minimize their expenses.

Other examples of patent fighting

- Apple sued Microsoft for copying its graphical user interface (GUI). Outraged, Xerox sued Apple of copying the GUI from them. Apple lost the case and Xerox would have won but waited too long to sue!
  - https://en.wikipedia.org/wiki/Apple_Computer,_Inc._v._Microsoft_Corp.
- Nokia won patent dispute regarding touch-screen technology with Apple in 2011. It got an undisclosed one time payment and now receives 2% iPhone revenues. These are estimated to exceed $30 billion annually.
  - http://www.bloomberg.com/news/articles/2011-06-14/nokia-apple-payments-to-nokia-settle-all-litigation
- Oracle launched a case against Google, alleging Android infringes Java patents, claiming $6.1 billion in damages. On May 26, 2016, the jury found in favor of Google, calling the use of the Java API to be "Fair Use." Oracle plans to appeal.
  - https://en.wikipedia.org/wiki/Oracle_America,_Inc._v._Google,_Inc.
- Apple, Microsoft, Sony, Ericsson & RIM (BlackBerry) bought Nortel's entire patent portfolio in 2011 for $4.5 billion.
  - http://www.wsj.com/articles/SB10001424052702303812104576440161959082234
- Google acquired Motorola and all of it's mobile telephony patents in 2011 for $12.5 billion. In 2014, it sold Motorola to Lenovo, but kept the patents and the cash! This was done to protect Android from Samsung and others.
  - http://www.forbes.com/sites/gordonkelly/2014/02/10/how-google-used-motorola-to-smack-down-samsung-twice/#140eaf4653ab

How patents became the rocket fuel of technological entrepreneurship

- Bayh-Dole Act -1980 (named for Senators Birch Bayh (D) and Robert Dole (R))
  - Gave the patent rights for intellectual property created in university research funded by the federal government to Universities.
  - Prior to Bayh-Dole, the rights went to the Federal Government.
- In order for a patent to be valuable enough to cause an organization to invest the money to commercialize it, that industry needs to be assured that they have rights to use the IP and that others cannot easily imitate their work.
- Prior to Bayh-Dole, an enterprise could not be assured that they had protected rights to intellectual property.
  - Prior to the enactment of Bayh-Dole, the U.S. government had accumulated 28,000 patents, but fewer than 5% of those patents were commercially licensed.
- After Bayh-Dole, Universities got very good at licensing IP to industries. This gave the industries the protected rights that they needed and it also created a significant revenue stream for Universities and Government labs.

Bayh-Dole results

- As the Economist Noted ("Innovation's Golden Goose." The Economist, December 12, 2002.):

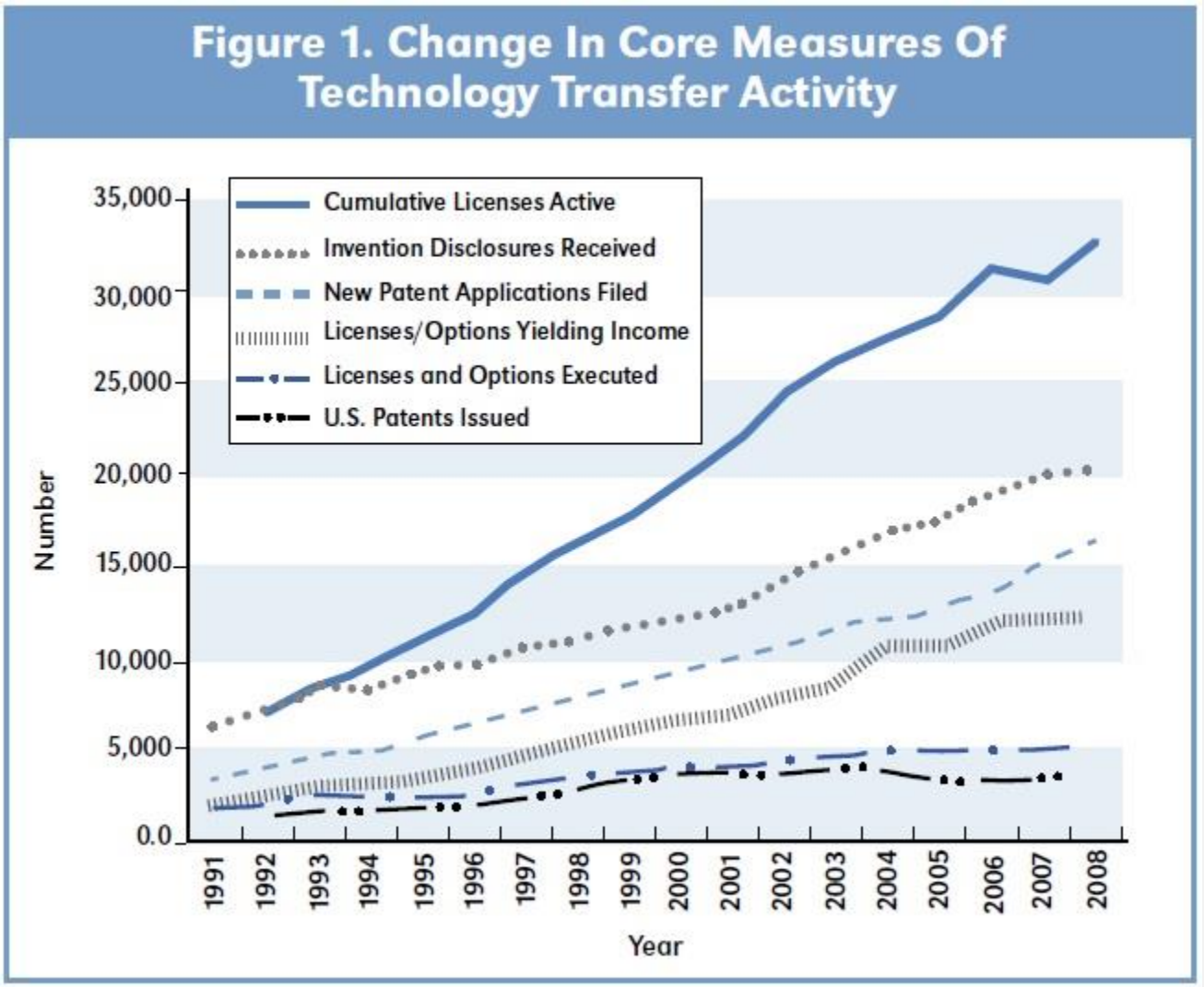
"*Possibly the most inspired piece of legislation to be enacted in America over the past half-century was the Bayh-Dole act of 1980. Together with amendments in 1984 and augmentation in 1986, this unlocked all the inventions and discoveries that had been made in laboratories throughout the United States with the help of taxpayers' money. More than anything, this single policy measure helped to reverse America's precipitous slide into industrial irrelevance*."

…….

Remember the technological malaise that befell America in the late 1970s? Japan was busy snuffing out Pittsburgh's steel mills, driving Detroit off the road, and beginning its assault on Silicon Valley. Only a decade later, things were very different. Japanese industry was in retreat. An exhausted Soviet empire threw in the towel. Europe sat up and started investing heavily in America. Why the sudden reversal of fortunes? Across America, there had been a flowering of innovation unlike anything seen before.

http://www.bu.edu/otd/files/2011/02/The_Bayh-Dole_Act_Turns_30.pdf

Bayh-Dole



http://www.bu.edu/otd/files/2011/02/The_Bayh-Dole_Act_Turns_30.pdf

- As early as 1992, stories started to appear in the business press talking about how regions anchored by research universities were becoming centers of high tech job growth.12
- •154 FDA approved drugs have been brought to market since 1980 which were discovered in whole or in part at U.S. public sector research institutions.13
  - o From 1990—2008, 9 percent of all drugs approved by the FDA, and 21 percent of the most innovative drugs approved by the FDA, were based on discoveries at public sector research institutions.
  - o As shown on the previous page, the rate at which public sector researchers started discovering these drugs stepped up significantly in 1980,14 the year Bayh-Dole was passed.
  - o In 2008, worldwide sales of these drugs was estimated to be $103 billion.
- • Well known products such as the Web browser, email programs that can attach documents, the Vchip, hollow optical fibers, the nicotine patch, the PSA test, Google, the Honeycrisp apple, cochlear implants, lightning detection technology, the Hib vaccine, improved guardrail systems and cell phone technologies all have their roots in university research. 15

http://www.bayhdole.com/files/2011/02/The_Bayh-Dole_Act_Turns_30.pdf

- •From 1980-2008, 6,652 start-up companies were formed and 3,381 of these companies were still operating at the end of 2008.16
  - **o** 72 percent of these companies had their primary place of business in the institution's home state.
  - **o** Every state, except Alaska, has had at least one start-up company formed as a result of licensing technology from university research.
  - **o** In 2008 alone, 595 new start-up companies were formed—11 every week.
  - **o** In a study of just 100 university spin-outs, total employment at 81 of the companies was 167,000, and total revenues at just 31 of these companies were $95 billion in 2008.
- Another study found that from 1996 to 2007 university licensed products created over 279,000 jobs17 and that academic technology transfer contributed as much as $187 billion to U.S. GDP between 1996 and 2007.18

http://www.bu.edu/otd/files/2011/02/The_Bayh-Dole_Act_Turns_30.pdf

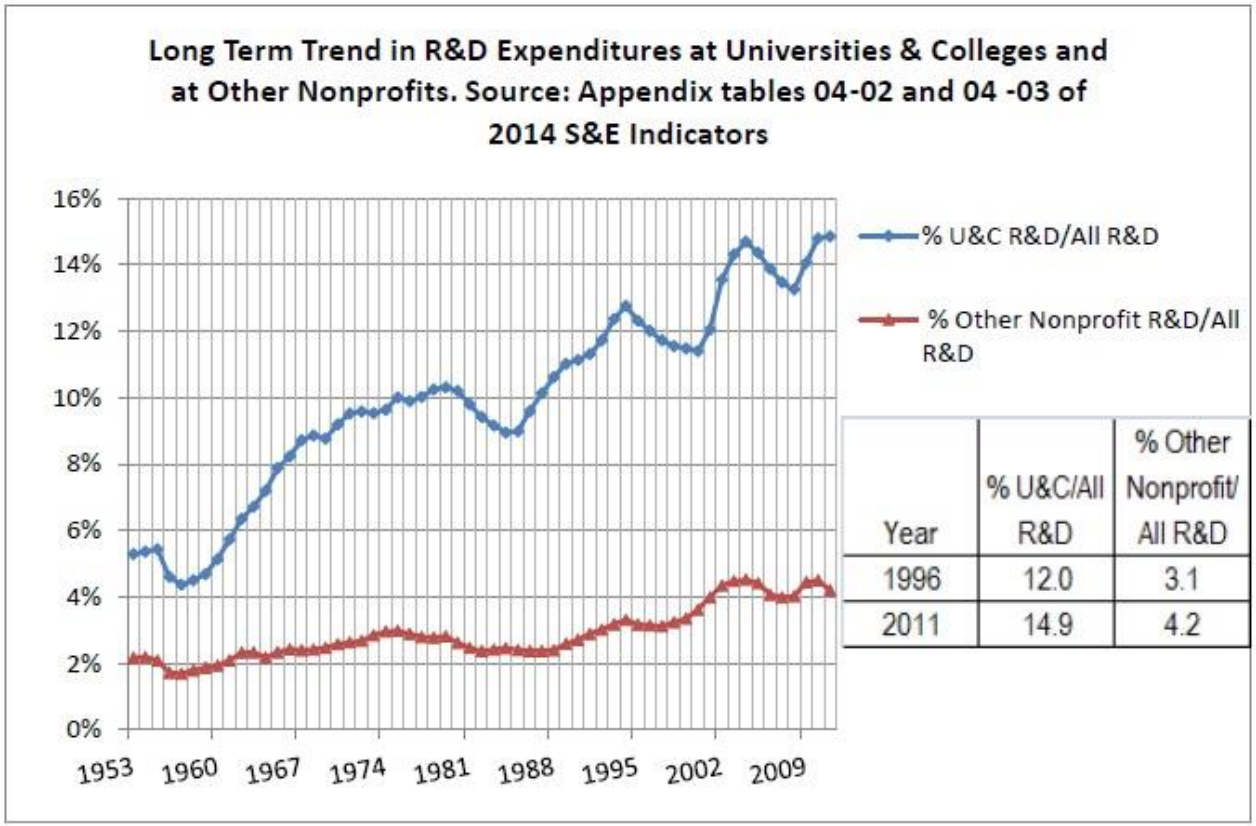
An entire industry, biotechnology, was created from university start-up companies.

- 76 percent of biotechnology companies have a license from a university.
- At least 50 percent of current biotech companies got their start as a result of a university license.20
- These biotech companies represented over 1.42 million jobs in 2008.21
- The bioscience sector represents an employment impact of 8 million jobs, with 5.8 jobs created for every new bioscience job.22

http://www.bu.edu/otd/files/2011/02/The_Bayh-Dole_Act_Turns_30.pdf

University Research Growth

- AUTM- Association of University Technology Managers



Year	% U&C/All R&D	% Other Nonprofit/ All R&D
1996	12.0	3.1
2011	14.9	4.2

https://www.bio.org/sites/default/files/BIO_2015_Update_of_I-O_Eco_Imp.pdf

Top 20 Universities in Commercialization (2010)

- Here are the top 20 technology transfer programs among universities included in the AUTM survey, ranked by 2010 licensing income:
- 1. Northwestern University, $180 million
  2. New York University, $178 million
  3. Columbia University, $147 million
  4. University of California System, $104 million
  5. Wake Forest University, $86 million
  6. University of Minnesota, $84 million
  7. Massachusetts Institute of Technology, $69 million
  8. University of Washington/Washington Research Foundation, $69 million
  9. Stanford University, $65 million
  10. University of Wisconsin-Madison/Wisconsin Alumni Research Foundation, $54 million
  11. California Institute Of Technology, $52 million
  12. University of Rochester, $42 million
  13. University of Massachusetts, $40 million
  14. University of Michigan, $40 million
  15. University of Texas System, $38 million
  16. University of Utah, $38 million
  17. University of Florida, $29 million
  18. University of Iowa Research Foundation, $27 million
  19. Duke University, $26 million
  20. University of South Florida, $17 million

- Federally-funded inventions commercialized under Bayh-Dole contributed $1.18 trillion to our economy while supporting nearly 4 million good jobs, and create more than two new products and companies every day of the year.
- "The report, entitled, *"The Economic Contribution of University/Nonprofit Inventions in the United States: 1996- 2013,"* estimates that during this 18-year time period academic-industry patent licensing bolstered U.S. gross industry output by up to $1.18 trillion, U.S gross domestic product (GDP) by up to $518 billion, and supported up to 3,824,000 U.S. jobs."
  - https://www.bio.org/articles/Value-of-Academic-Industry-Patents
  - https://www.bio.org/sites/default/files/BIO_2015_Update_of_I-O_Eco_Imp.pdf

Attacks on Bayh-Dole

- Not everyone likes Bayh-Dole
- An alliance of some professors and many industries are lobbying to turn the patent rights over to the Professors instead of too the University.
- Under current law the Professors generally split about 35% of patent proceeds.
  - Many feel that they should get 100%
- One might ask why industry is in this fight?
- University Technology transfer offices are very tough and professional negotiators.
- Industry feels that it would be easier and less expensive to negotiate with professors.
  - Their public argument is that this would lead to more rapid commercialization of new research.
- Another contingent of professors feels that all of this corporate commercialization is corrupting the university.
  - However, many current professors feel they benefit from the relationship with industry both financially and in access to data and projects for their research.
- All of these issues remain in active contention.

References for Bayh-Dole contention

- "Bayh-Dole: Don't Turn Back The Clock;" Sen. Birch Bayh; *Licensing Executives Society 2006 Annual Meeting, New York, NY, Sept. 12, 2006.*
  - Senator Birch Bayh - Don't Turn Back the Clock - Joseph ...
- "Eternal Vigilance is the Price of Bayh-Dole;" Joseph Allen; IP Watchdog; Sept. 28, 2014.
  - http://www.ipwatchdog.com/2014/09/28/eternal-vigilance-is-the-price-of-bayh-dole/id=51417/
- "The Bayh-Dole Act Turns 30;" Vicki Loise, CAE, and Ashley J. Stevens, CLP; *les Nouvelles;* Dec. 2010.
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  - http://www.pnas.org/content/111/18/6542.full
- "Is University Research Missing What Matters Most?" Paul Basken; *Chronicle of Higher E*d.; Jan 24, 2016
  - http://chronicle.com/article/Is-University-Research-Missing/235028?cid=at&utm_source=at&utm_medium=en&elq=4d776f7427024c66afec24192718e158&elqCampaignId=2284&elqaid=7617&elqat=1&elqTrackId=231134409f74456ba09dbef63be5aa29
- "Changing the academic culture: Valuing patents and commercialization toward tenure and career advancement;" Paul R. Sanberga, et.al.; *Proc. Nat. Acad. of Sciences of the U.S.*; Vol. 11 No. 18; 2014.

Patent Trolls

- As the number of patents, many for doubtful products and business methods, proliferated over the last few decades, another form of patent abuse began to arise.
- Companies with no other mission would simply buy up collections of existing patents and then find companies that they could sue while claiming the company was infringing their patents.
- Larger companies would often make the business decision that it would be cheaper to pay them off than it would be to fight them in court.
- These people are often known as “Patent Trolls” and one can debate whether that is fair or not.
  - http://en.wikipedia.org/wiki/Patent_troll
  - https://www.eff.org/issues/resources-patent-troll-victims
- Recent Supreme Court Decisions appear to be reducing the number of cases being filed.
  - http://www.motherjones.com/kevin-drum/2014/10/after-supreme-court-decision-patent-trolls-getting-cold-feet

Key patent issues

- In 2013 the US patent law was changed dramatically
- US converted from “First to Invent” to “First to file” in 2013.
  - For this reason you should be careful not to follow materials written under the old law, since that could invalidate your patent opportunities.
  - Before 2013, there was a lot of work being done to establish who first invented any particular patent. That was why documentation was so important.
  - Now this is no longer relevant. If you invent something and keep it secret and someone else finds out about it and files the patent, you will find it difficult to stop them.
  - The patent priority will go to the first to file.

- US recognizes any filing in any WTO country as establishing the same priority as if it was filed in the US.

  - Title 35 USC Section 119 (a) An application for patent for an invention filed in this country by any person who has, or whose legal representatives or assigns have, previously regularly filed an application for a patent for the same invention in a foreign country which affords similar privileges in the case of applications filed in the United States or to citizens of the United States, or in a WTO member country, shall have the same effect as the same application would have if filed in this country on the date on which the application for patent for the same invention was first filed in such foreign country, if the application in this country is filed within twelve months from the earliest date on which such foreign application was filed.

Patent Considerations

Prior to 2013 there was a lot of uncertainty in patent protection for natural products

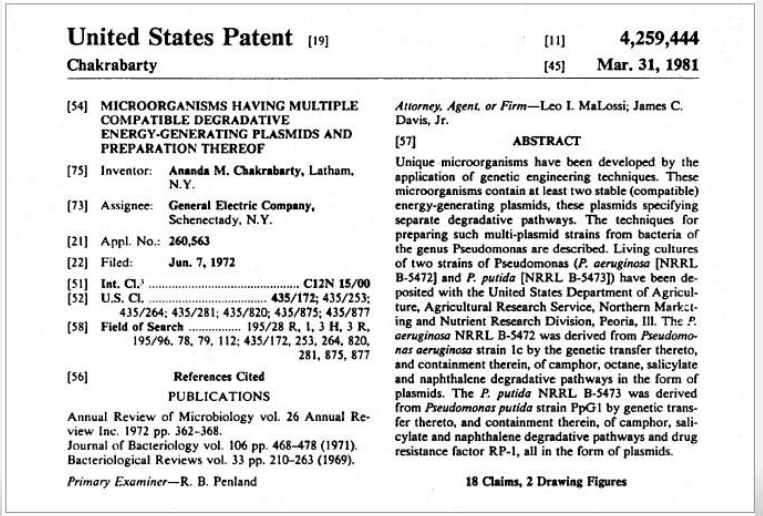
- Could naturally occurring genetic sequences be patented?
- Could a company patent its DNA amplification technique (scientific process)?
- Could the sequence of events constituting the test be patented?

The year 2013 was a big change in patenting law:

- Before 2013 genes could and were patented in the US
- After 2013 naturally occurring DNA could NOT be patented.
  - Synthetic "complementary DNA (cDNA)" however could be
    - cDNA does not occur in nature

Patenting Natural Products – 1980 Beginning

- "A live, human-made microorganism is patentable."
  - That declaration, made by Supreme Court Chief Justice Warren Burger on June 16, 1980, in the majority opinion in the case of Diamond v. Chakrabarty, upended a legal doctrine that had stood for nearly a century. The ruling was enormously important for the emerging biotechnology industry.
  - "It was, Burger wrote, both a manufacture, "a useful article produced from raw or prepared materials by giving to these materials new forms, qualities, properties or combinations," and a composition of matter, "a combination of two or more substances."
    - "Mr. Pseudomonas;" LSF Magazine; Fall 2015; p 40
      - http://biotechhistory.org/lsf-magazine/



United States Patent [19]
Chakrabarty

[11] **4,259,444**
[45] **Mar. 31, 1981**

[54] **MICROORGANISMS HAVING MULTIPLE COMPATIBLE DEGRADATIVE ENERGY-GENERATING PLASMIDS AND PREPARATION THEREOF**

[75] Inventor: **Ananda M. Chakrabarty**, Latham, N.Y.

[73] Assignee: **General Electric Company**, Schenectady, N.Y.

[21] Appl. No.: **260,563**

[22] Filed: **Jun. 7, 1972**

[51] **Int. Cl.**³ **C12N 15/00**

[52] **U.S. Cl.** **435/172**; 435/253; 435/264; 435/281; 435/820; 435/875; 435/877

[58] **Field of Search** ..... 195/28 R, 1, 3 H, 3 R, 195/96, 78, 79, 112; 435/172, 253, 264, 820, 281, 875, 877

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Journal of Bacteriology vol. 106 pp. 468–478 (1971).
Bacteriological Reviews vol. 33 pp. 210–263 (1969).

Primary Examiner—R. B. Penland

Attorney, Agent, or Firm—Leo I. MaLossi; James C. Davis, Jr.

[57] **ABSTRACT**

Unique microorganisms have been developed by the application of genetic engineering techniques. These microorganisms contain at least two stable (compatible) energy-generating plasmids, these plasmids specifying separate degradative pathways. The techniques for preparing such multi-plasmid strains from bacteria of the genus Pseudomonas are described. Living cultures of two strains of Pseudomonas (*P. aeruginosa* [NRRL B-5472] and *P. putida* [NRRL B-5473]) have been deposited with the United States Department of Agriculture, Agricultural Research Service, Northern Marketing and Nutrient Research Division, Peoria, Ill. The *P. aeruginosa* NRRL B-5472 was derived from *Pseudomonas aeruginosa* strain 1c by the genetic transfer thereto, and containment therein, of camphor, octane, salicylate and naphthalene degradative pathways in the form of plasmids. The *P. putida* NRRL B-5473 was derived from *Pseudomonas putida* strain PpG1 by genetic transfer thereto, and containment therein, of camphor, salicylate and naphthalene degradative pathways and drug resistance factor RP-1, all in the form of plasmids.

18 Claims, 2 Drawing Figures

Cover page of patent #4,259,444 issued to Chakrabarty and General Electric in 1981

Limiting Patents of Human Products

- In 2013, Myriad Genetics tried to patent two genes: BRCA1 and BRCA2.
  - Mutations in either led to a great increase in the risk of breast cancer.
  - They also filed a patent for a test for the genes.
- The US Supreme court ruled unanimously that the genes were NOT patentable, but that the test was patentable. June 13, 2013
  - In some ways it was a return to the standards originating in 1889 in which natural products were deemed a product of nature that could not be patented.
  - "The Court struck down patent claims on genomic DNA that has been **merely "isolated**" from the body, where "isolated" means, well, "isolated"—removed and separated from its natural environment in the cell. More specifically, the Court held that genomic DNA does not meet the threshold test of patentable subject matter under section 101. It **upheld the subject matter status of cDNA**, which it defined as "synthetically created DNA . . . which contains the same protein-coding information found in a segment of natural DNA but omits portions within the DNA segment that do not code for proteins [introns]." Every patent drafted like Myriad's first and broadest claim—"an isolated DNA coding for [a specified protein]"—is now invalid. Conversely, claims limited to cDNA versions of genes continue to pass the threshold test, though they are still subject to scrutiny under all the other patentability requirements."
  - http://www.genomicslawreport.com/index.php/2013/06/18/myriad-finally-supreme-court-surprises-by-not-surprising/

CRISPR –Bayh-Dole-First to Invent or File?

- In 2016 to the present, we were seeing one of the titanic fights over intellectual property. The potential monetary implications were huge!
  - http://www.statnews.com/2016/03/08/crispr-patent-fight/
- Who invented CRISPR?
  - Feng Zhang of MIT's Broad Institute? He presently received the patent.
  - Jennifer Doudna of the University of California Berkeley? She was the first to file –but she did it on March 15, 2013 based upon a paper form 2009.
  - Remember that the law changed from first to invent to first to file on March 16!!!!!
  - Zhang did not file until October of that same year! He claimed that he was the first to invent the use of CRISPR to edit the genes of living creatures. The patent office agreed.
    - The Doudna paper in January of 2009 showed how to edit genes in a test tube.
    - Zhang did the same for living creatures.
    - The UC Berkeley law suit claims that his extension to living creatures was "OBVIOUS." MIT disagrees.
- And now the dispute is in the courts. Who will win?
  - http://www.statnews.com/2016/03/18/crispr-patent-dispute/
  - http://www.sciencemag.org/news/2016/12/crispr-patent-hearing-produces-no-clear-winner-only-soft-signals
- CRISPR Case Study by Jack M. Wilson
  - http://www.jackmwilson.net/Entrepreneurship/Cases/Case-CRISPR-MITvsUC-IP.pdf

Easy to obtain, expensive to defend?

- Patents are fairly easy to obtain, but can be very expensive to defend.

CRISPR patent fight: The legal bills are soaring

Stat; August 12, 2016. (https://www.statnews.com/2016/08/12/crispr-patent-fight-legal-bills-soaring/)

- *"The meter is running like mad on the dispute over key patents on CRISPR genome editing. In its latest 10-Q filing with the Securities and Exchange Commission, Editas Medicine — which has licensed one of the patents in question — disclosed that it has spent $10.9 million so far this year on legal fees incurred by the Broad Institute and Harvard, mostly to defend patents awarded for CRISPR inventions by the Broad's Feng Zhang."*
  "That cost is on top of $4.7 million spent in 2015. And the dispute has, in all likelihood, years to run."
- *"'The thing about patent litigation is, no matter who wins, the lawyers always win,' said Sherkow. 'That's not because the attorneys are doing anything improper, but because both sides are paying their attorneys to fight vigorously. Like any war of mercenaries, their employers can call off the fight if they wish. But when both sides are invested in victory, being a soldier of fortune is lucrative.' And when someone else is footing the bill, there is little financial incentive to call off the war."*
- Legal resolution is expected in 2017
  - unless a settlement is reached between MIT and Berkeley.
- Read the complete CRISPER Case here:
  - http://www.jackmwilson.net/Entrepreneurship/Cases/Case-CRISPR-MITvsUC-IP.pdf

EU (European Union) Gene Patent Issues

As an example of the difference between European and US patenting approaches:

- Simple discovery of an element of the human body is not patentable
- However, such sequences might be patentable if they were isolated from the human body and an industrial application disclosed.
- Before 2013 they were quite different, but after 2013 the differences were much less.

Process Patent Issues (Biotech)

- US: New and useful process can be patented
  - Method of making
  - Method of using
  - Any law of nature, natural law, or abstract idea is excluded

- EU: useful, novel, & involved an inventive step(non-obvious)
  - Excludes: contrary to public order or morality
    - Cloning, human stem cells, human genetic modification, industrial use of embryos

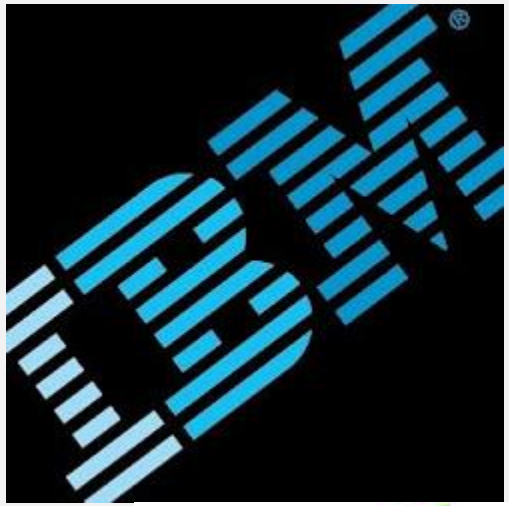
Trademarks

- A trademark is any word, name, symbol, or device used to identify the source or origin of products or services and to distinguish those products or services from others.

CISCO SYSTEMS

EMPOWERING THE INTERNET GENERATION℠

ApplePay
iPad
iPod
iPhone
But not iWatch!



Microsoft Windows

What can be trademarked?

Name is trademarked

Symbol is trademarked
(and is a graphic representation of the Golden Gate Bridge as seen below)

Slogan is trademarked

What can be Trademarked?

Yang

Starbox is too close to Starbucks! But the other designs can all be trademarked.

The Trademark Law Protects:

- Words
  - Excluding:
    - Pure description of a product/service
    - Deceptive marks
    - A mark consisting primarily of a surname
- Numbers and letters
- Designs or logos
  - Must be distinctive rather than generic
- Sounds – Distinctive
- Fragrances – Cannot enhance the use of the product
- Shapes – No impact on the product's function
- Colors – not functional
- Trade dress
  - The manner in which a product or a business is "dressed up" to appeal to customers is protectable.

The Process of Obtaining a Trademark

- Select an appropriate mark, words, design, logo, sound, shape or other legal trademark
- Search the Trademark Office files to see if it is already in use.
- Register the trademark

- You can claim a trademark even if you do not register it, but the protection may not be as complete.

Why Register a Trademark?

- Technically, a trademark does not need to be registered to receive protection and to prevent other companies from using a confusingly similar marks.
- So why to register a trademark with the USPTO?
  - To get a National priority
  - To use of registration mark ®
  - To Block import of infringing products
  - Improve prospects in legal action for damages

Copyrights

- Copyrights
  - A copyright is a form of intellectual property protection that grants to the owner of a work of authorship the legal right to determine how the work is used and to obtain economic benefits from the work.

- What is Protected by a Copyright?
  - Literary works
  - Musical compositions (and derivative works)
  - Dramatic works
  - Pantomimes and choreographic works
  - Pictorial, graphic, and sculptural works

How to Obtain a Copyright

- Copyright law protects any work of authorship the moment it assumes a tangible form. Technically, it is not necessary to provide a copyright notice or register work with the U.S. Copyright Office.
- The following steps can be taken, however, to enhance copyright protection.
  - Copyright protection can be enhanced by attaching the copyright notice, or "copyright bug"  to something.
  - Further protection can be obtained by registering the work with the U.S. Copyright Office.

Characteristics of Patents, Trademarks, and Copyrights

Let's compare the various ways that you might try to protect your intellectual property:

IP Type	What It Covers	Time Required	Cost
Copyright	Works of original authorship	About 2 weeks	About $35-65
Trademark	Logos, names, etc.	6 months to 1 year	$900-1500
Design patent	The look of an original product	Up to 2 years	$5000-20000
Utility patent	How an original product works	2-5 years	$5000-20000
Business method patent	A business process or procedure	2-5 years	$5000-20000

Homer Simpsons Favorite Drink is “Flaming Moe”

- Some things are best protected by being a “trade secret.”

- Flaming Moe Secret Recipe
  - 1 oz. Brandy
  - 1/2 oz. Blackberry Liqueur
  - 1 oz. Creme de Menthe
  - 1 oz. Pineapple Juice
  - 1 oz. Sloe Gin
  - 2 tbsp. Grape Cough Syrup

Trade Secrets

- A piece of knowledge that confers an advantage on a firm and is protected by non-disclosure
- Protect a competitive advantage without disclosing how an underlying technology works
- There are some disadvantages
  - **Must** be kept hidden to remain valuable
  - Doesn't provide a monopoly right
  - To enforce and claim damages in court, must show a loss of competitive advantage
- What qualifies for trade secret protection
  - Is not known outside the company
  - Is known only inside the company on a "need to know" basis
  - Is safeguarded by stringent efforts to keep the information confidential
  - Is valuable and provides the company a compelling competitive advantage
  - Was developed at great cost, time, and effort
  - Cannot be easily duplicated, reverse engineered, or discovered.
- If you don't take active steps to protect it, then you lose it.

Coca Cola keeps its formula in a vault

- Companies need to take strong action to protect their Trade Secrets or they could lose them.

What Qualifies for Trade Secret Protection?

- Jack Young is the CEO of a small graphic design company in Orlando, Florida. Several months ago, he spent an entire day searching the Web site of Dolphin Graphics, a larger graphics design firm in Miami. From its Web site, Jack was able to put together a list of Dolphin's major customers and is using the list to prospect new customers for his firm. After discovering what Jack is doing, Dolphin has threatened to sue Jack if he doesn't stop using its customer list, which it claims is a trade secret. Is Jack infringing on Dolphin's trade secrets?

How to Protect Trade Secrets

Here are some of the actions that you should take to maintain a trade secret:

- Restricting access
- Labeling documents as secret and confidential
- Password protecting confidential computer files
- Maintaining logbooks for visitors
- Maintain logbooks for access to sensitive material
- Maintaining adequate overall security measures
- Asking the employees to sign nondisclosure and non-compete agreements.

Intellectual Property Audit

- An intellectual property audit is conducted to determine the intellectual property a firm owns.
    - whether its intellectual property is being properly protected.
    - remain prepared to justify its valuation in the event of a merger or acquisition.
- The Process
    - The first step is to develop an inventory of a firm's existing intellectual property, and how to protect them.
    - The second step is to identify works in progress to ensure that they are being documented and protected in a systematic, orderly manner.