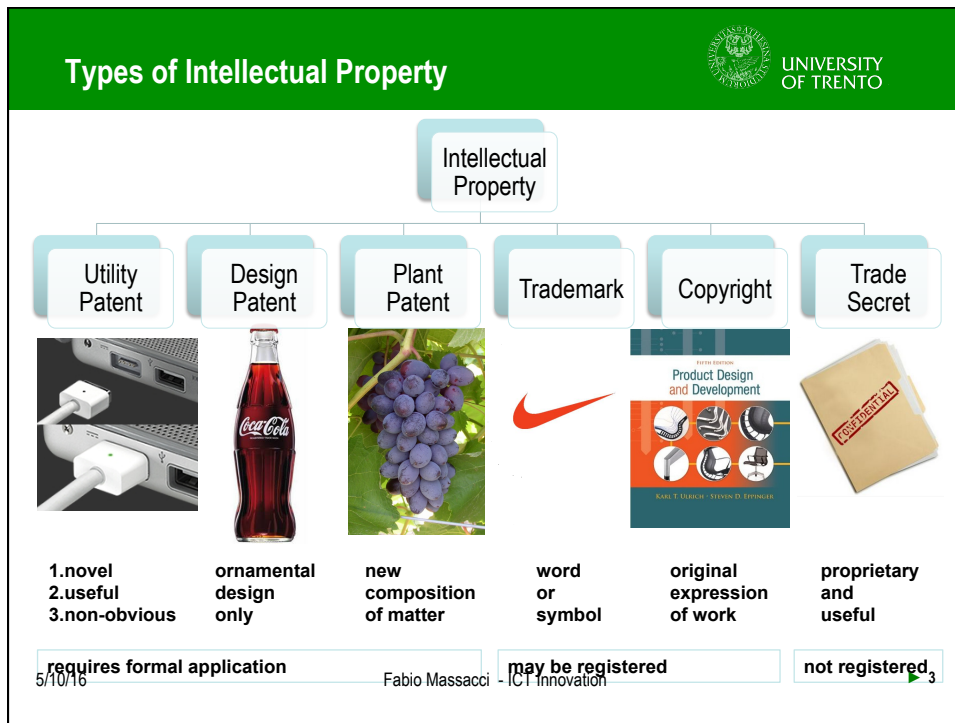


ICT Innovation – Spring 2016
MSc in Computer Science and MEng Telecom. Engineering
EIT Masters ITA, S&P,SDE

Lecture 06 – Intellectual Property Rights
Prof. Fabio Massacci

Value of Intellectual Property

- **Intellectual property (IP)**
 - intangible asset created by human intellectual or inspirational activity.
 - “Intellectual capital is recognized as the most important asset of many of the world’s largest and most powerful companies; it is the foundation for the market dominance and continuing profitability of leading corporations.”
 - K. King, World Intellectual Property Organization
- **There are many types of IP:**
 - trademarks, copyrights, designs, software, patents, trade secrets, processes, and other specialized knowledge.
- **For Fortune 500 companies, value of IP can be very large**
 - Pfizer (57B “cash”, 11B Equip., 35B IP, 42B Goodwill, over 169B)
 - Google (80B “cash”, 23B Equip.. 5B IP, 15B Goodwill over 131B)



Trade Secret

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- **Confidential information that is used for competitive advantage**
 - Prevents, but does not block, others from developing similar knowledge
 - Lasts as long as you can keep it secret
- **Protection varies by state and country**
- **Must actively work to protect trade secrets**
 - Nondisclosure agreements
 - Confidential markings
 - Employee education



Product Development Process Handbook


XYZ Inc.
Confidential




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Copyright  UNIVERSITY OF TRENTO

- **The right to make copies**
 - Arises from simply creating a work
 - Protects the expression – not the idea
 - Last 95 years!
- **Default copyright ownership**
 - Owned by author unless otherwise agreed (e.g. by employee or contractor agreement)
- **Open source**
 - For sharing and building 
- **Notice format is quite flexible**
 - Copyright © 2010, Google, Inc., All Rights Reserved
 - © 2010 Google Copyright Google

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Trademark  UNIVERSITY OF TRENTO

- **Valuable for building and protecting a brand**
- **A “mark” under which you sell goods and services**
 - House mark  
 - Product mark **ThinkPad** **iPad**
 - Rights valuable for use in commerce → ... TM
 - Federal registration in the US → ... [®]
- **Cannot protect “common names”**
 - Only the particular graphical form.
 - Generic **GIGABYTE** TM
 - Descriptive 
 - Suggestive 
- **Cannot protect “numbers” in any form**
 - “486” cannot be protected, “Pentium” can

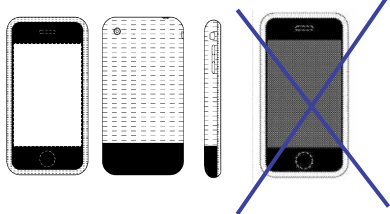
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Design Patents

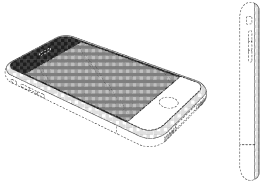
UNIVERSITY OF TRENTO

- **Only cover ornamental design**
 - Samsung vs Apple (“the” lawsuit) was a design patent one
 - IF right picture is “sufficiently described” by left crossed picture
 - THEN Samsug must give 1B to Apple
 - ELSE though luck

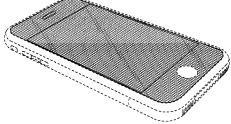
1. Apple - Filed Jan. 5 2007
(Application not accepted in full form)



2. Apple, Jul. 30 2007
(Continuation of 1)



3. Apple, Nov. 8 2008
(Continuation of 1)
Apple got 1B for violation of this one as time started on (1)



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Utility Patent

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- **Limited-time monopoly, granted by government, in exchange for teaching the public new and useful knowledge**
 - US/EU/JP/CN: 20 years from filing date
- **Key Feature**
 - Gives owner the right to exclude others from practicing the invention
 - Owner’s right to practice may be limited by others patent rights (similar or dominating inventions)
- **Real estate analogy:**
 - Right to prevent trespassers
 - Ownership ≠ right to use
 - limited by access rights, zoning, etc.
 - Claims of patent ≈ fence around property

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Requirements to Obtain a Patent




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- **Patentable subject matter**
- **Not previously sold or publicly described**
- **Novel**
 - prior art must be cited
- **Useful**
 - for some demonstrable need or value
- **Not obvious**
 - “to one of ordinary skill in the art”
 - prior art “teaches against”
 - initial commercial success may demonstrate

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What is in a Patent?



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- **Description**
 - **Field of the invention**
 - Describe the problem addressed
 - **Background of the invention**
 - Describe the “prior art”
 - List advantages over existing methods
 - **Summary of the invention**
 - **Detailed description**
 - Best mode: the best way to implement the invention
 - Examples of use and modes of implementation
- **Claims**
 - unique characteristics of the invention
 - owner can prevent others from practicing the invention only through the claims.

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Coffee cup sleeve



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- **1711 patents on beverages and containers**
 - TTL/beverage AND TTL/container
- **US Pat.# 5,205,473 in 1992**
 - By “Design by Us”



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Coffee cup Sleeve – Summary



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- **Recyclable corrugated beverage container and holder**
 - Corrugated beverage containers and holders are which employ recyclable materials, but provide fluting structures for containing insulating air.
 - These products are easy to hold and have a lesser impact on the environment than polystyrene containers.
- **Description**
 - 14 Paragraphs
 - 13 Figures
- **18 Claims**




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Coffee Cup Sleeve - Claims



- **1. A recyclable, insulating beverage container holder, comprising**
 - a corrugated tubular member comprising cellulosic material and at least a first opening therein for receiving and retaining a beverage container,
 - said corrugated tubular member comprising fluting means for containing insulating air;
 - said fluting means comprising fluting adhesively attached to a liner with a recyclable adhesive.
- **2. The holder of claim 1, wherein**
 - said tubular member comprises a corrugated tube having first and second open ends of unequal cross-sectional dimensions

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Functioning of the fluting

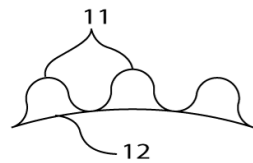


Fig. 6a

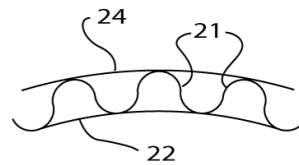


Fig. 6b

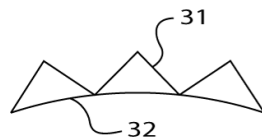


Fig. 7a

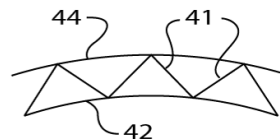


Fig. 7b

From *Product Design and Development* by Karl Ulrich and Steven Eppinger (McGraw-Hill/Irwin)

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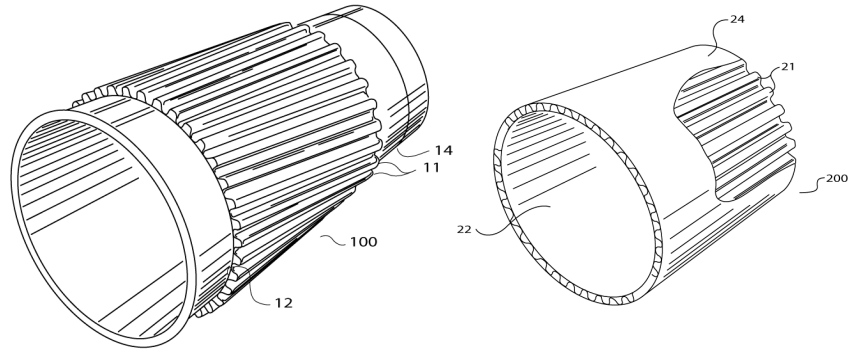
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Functioning of the holder



- Open ends of unequal dimensions

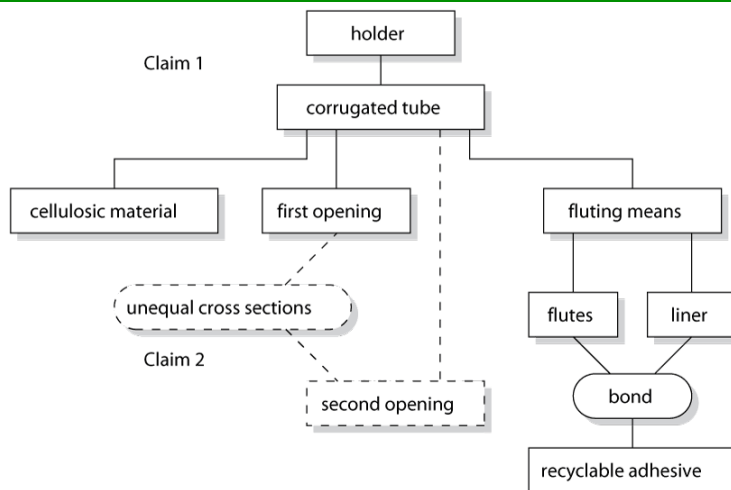


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Coffee cup sleeve - Claims 1 and 2 - cont



From *Product Design and Development* by Karl Ulrich and Steven Eppinger (McGraw-Hill/Irwin)

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Patents and Business Plans  UNIVERSITY OF TRENTO


- **Freedom to Make, License and Sell your Product**
- **Does Your Company Own the Technology?**
 - Assigned by Inventor to Company?
 - Licensed from University?
 - Did it go into the Public Domain?
 - Public Disclosure/On Sale Bars
- **What is your Strategy?**
 - Patenting vs Disclosing to Prevent Others from Patenting
 - Patenting to force others to license your products
 - Patenting to force others to buy your company
 - Software patents...

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Obtaining a Patent  UNIVERSITY OF TRENTO


- **The Application Process breaks down into four main projects**
 - Determining What to Patent
 - Determining When to File
 - Preparing one or more Patent Applications
 - Prosecuting the Applications

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What to Patent  UNIVERSITY OF TRENTO


- **Determining What to Patent**
 - **Probably the most important step**
 - Do NOT ask “What can I get a patent on?”
 - Ask instead “What do I want a patent on?”
 - What is of commercial value to my company?
 - How would my competitors use my technology?
 - **Patent owner can prevent others from “making, using, selling, or importing”**
- **Show stoppers**
 - **Compare against the prior art**
 - **No dominating patents**
 - Another patent dominates yours if you practice at least one claim of theirs. (Handle on Coffee Cup)
 - It is OK if you have permission to infringe from the owner of the dominating patent, i.e., a license

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When to File  UNIVERSITY OF TRENTO


- **Determining When to File**
 - **Before you lose rights**
 - Before a public disclosure
 - Before an “on sale” bar
 - **In time to have a patent to protect your products**
- **Provisional Patent Applications (in the US)**
 - **Requires a meaningful description of the invention**
 - **Protects invention for one year (See how market goes)**
 - **Fast and Cheap but nothing happens at the USPTO**
 - **What you fail to disclose may not be protected**

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Costs  UNIVERSITY OF TRENTO


- **Patent Applications**
 - 5-15K\$ for preparing the application
- **Patent Filing Costs**
 - EU Filing fee → 6-8K\$
 - US Filing fee → 400-800\$ + Prosecution 5-15K\$
 - Internation PCT demand 1-2.5K\$ + filing fee 2.5-4K\$
 - Japanese Filing/Trans. fee is about 7-10K\$
- **Worldwide Costs (Gov. Accounting Office study):**
 - 300-500K\$ in 10 countries over the life of the patent

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Software Patents  UNIVERSITY OF TRENTO


- **With chemicals, plants or physical inventions you create “something”**
 - Common use → manufacture and sell invention or license it to people who sell it
 - Natural interpretation of invention
- **Many Software patents protect features that are hardly inventions (from any reasonable perspective)**
 - Used to create “legal arsenal” to force competitors to negotiate on services and use of software
 - Software “royalties” are close to not existing
 - MP3 Licenses to Fraunhofer being the mostly known exception
 - Occasionally you hear top brass of Google, Facebook, Microsoft, etc. moaning about “Patent Trolls” (i.e. people who try to rightly extract royalties from patents) → let’s see who’s right

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Patents on search interfaces  UNIVERSITY OF TRENTO

- **Search Interfaces: 158 Patents**
 - TTL/Search AND TTL/Interface
- **Search Interfaces for the Web/Internet: 19 Patents**
 - ... AND (ABST/Internet OR ABST/Web)
- **Earliest Patent 5,982,370 Filed 1997 by IBM**
 - Highlighting tool for **search** specification in a user **interface** of a computer system
- **Google Patents: 4 (earliest filed in 2003)**
 - **Interface** for a universal **search** engine
 - ... AND AN/Google

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US Patent #5,982,370 – filed 1997 (IBM)  UNIVERSITY OF TRENTO

- **Highlighting tool for search specification in a user interface of a computer system**
 - A search interface is provided that is easy to use and understand.
 - A unique visual metaphor in the form of a "highlight" tool is used for this purpose.
 - The highlighting tool is used to identify search terms. In one embodiment, a user uses the tool to mark text on a document, such as an HTML document displayed in a *Web* browser.
 - Upon selection of this text, and preferably following a time delay, a pop-up menu appears that offers the user the option of searching for this text.
 - After searching and receiving the results, the user can again use the highlighting tool to mark one or more words/terms (or other information, such as a URL) within the results listed.

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US Patent 7,447,678 – filed 2003 (Google)



- **Interface for a universal search engine**
 - A search engine may perform a search for a user search query over a number of possible search categories.
 - For example, the search query may be performed for general *web* documents, images, and news documents.
 - The search engine ranks categories based on the search query and/or the documents returned for each category and presents the search results to the user by category.
 - Higher ranking categories may be presented more prominently than lower ranking categories.

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Universal search engine - Claims



- **1. A method comprising:**
 - receiving a search query;
 - performing a search, in response to the search query, on a database including a plurality of document categories to obtain a list of search results corresponding to each of the document categories;
 - ranking the document categories relative to one another based on a content of documents in each of the lists of search results;
 - and generating a document in which the list of search results corresponding to each of at least two of the document categories are presented in sections by category based on the ranking of the at least of the document categories, where...
- **Which ones would you held as “Novel AND Non Obvious”?**

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Universal search engine - Claims



- **A method comprising:**
 - receiving a search query;
 - performing a search, in response to the search query, on a database including a plurality of document categories to obtain a list of search results corresponding to each of the document categories;
 - ranking the document categories relative to one another based on a content of documents in each of the lists of search results;
 - and generating a document in which the list of search results corresponding to each of at least two of the document categories are presented in sections by category based on the ranking of the at least of the document categories,
 - where a first section of the generated document corresponding to a higher ranking one of the at least two of the document categories is more prominently presented within the generated document than a second section of the generated document corresponding to a lower ranking one of the at least two of the document categories,
 - and the first section presents a textual snippet associated with respective ones of the listed search results corresponding to the higher ranking document category
 - and the second section does not present a textual snippet associated with each of the listed search results corresponding to the lower ranking document category.

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Search Interface patent – Claims discussion




- **The method of claim 1, where**
 - 2.... the generated document includes the search results as hyper-text transfer protocol (HTTP) links.
 - 3 the first section includes more of the search results than are included in the second section.
 - 4 at least one of the sections includes a title describing the category corresponding to the at least one section.
 - 5. ... at least one of the sections includes a link to additional search results for the category corresponding to the at least one section.
 - 6 the generated document is a web page.
 - 7. ... ranking the document categories is further based on the search query.
 - 8. ... the first section is presented on a left hand side of the generated document.
 - 9. ... the document categories include at least one of a news category, an image category, or a product category.
 - 10. ... the document categories include a general web page category.
- **Which ones would you held as “Novel AND Non Obvious”?**

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Bookmark's Patent




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- **US Patent Office**
 - CCL/715/207 (**Hyperlink display attribute**) → 442 Patents
 - CCL/715/207 AND ABST/Bookmark → 5 Patents
 - 1 Google (2007), 2 IBM, 1 NEC, 1 some Mr. Burke (2000)
- **Patent 8,433,995 by Google, filed in 2007**
 - Methods and apparatus, including computer program products, implementing and using techniques for managing bookmarks associated with web pages.
 - A button is displayed on a graphical user interface associated with a browser displaying a web page on the computer display.
 - A user input selecting the button is received.
 - Each time the button is selected, an editing window is displayed, which includes several *bookmark* editing operations for the displayed web page.
 - The *bookmark* editing operations can be completed by a user in the editing window.
- **Detailed Description**
 - 18 Paragraphs, 7 Figures
- **33 Claims**

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Bookmarks' patent - Claim 1




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1. **A computer-implemented method for managing bookmarks associated with web pages, comprising:**
 - providing an interface element on a graphical user interface associated with a browser currently displaying a web page on a computer display,
 - the interface element being operable to be displayed in three different states, wherein each state indicates a bookmarking status of the currently displayed web page;
 - displaying the interface element in a non-bookmarked state if the currently displayed web page has not been bookmarked;
 - displaying the interface element in a bookmarked state if the currently displayed web page has been bookmarked;
 - receiving a user input selecting the interface element;

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Bookmark Patent – Workflow of Claim 1

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```
graph TD; S1[STATE 1: Page Not Bookmarked 200] <--> S2[STATE 2: Editing Window Mode 202]; S2 <--> S3[STATE 3: Page Bookmarked 204]; S3 <--> S2; S2 <--> S1;
```

FIG. 3

FIG. 2

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Bookmarks' patent – Claims discussion

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- **The method of claim 1,**
 - 2 ... comprising:
 - receiving user input performing one or more bookmark editing operations in the editing window;
 - and updating a bookmark record for the user at a remote server in response to the received user input.
 - 3 ... the graphical user interface is a toolbar in a browser.
 - 4 ... displaying a semi-transparent editing window overlaying the currently displayed web page.
 - 5. ... displaying an editing window with a text box in which a user can enter a custom name for the currently displayed web page.
 - 6. ... displaying an editing window with one or more categories with which the currently displayed webpage can be associated.
 - 7. ... displaying a checkbox adjacent to each category in the editing window, the checkboxes being operable to be checked by a user to indicate an association between the currently displayed web page and the category adjacent to the checked checkbox.
- **Which ones will you held “Novel AND Non Obvious”?**

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A More Interesting Claim


FIG. 5

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A bit of history

- **Marc Andreessen – Post on Comp.Infosystem Feb/1993**
 - NCSA is developing a new X/Motif-based networked information systems browser called X Mosaic.
 - History list per window (both 'where you've been' and 'where you can go').
 - Global history with previously visited locations visually distinct; global history is persistent across sessions.
 - Hotlist/bookmark capability -- keep list of interesting documents, add/remove items, list is persistent across sessions
 - Personal annotations with GUI annotation entry dialog; annotations can later be edited or deleted, and hyperlinks to existing annotations are inlined into subsequent accesses of an annotated document.
- **Mentioned by Tim Berners Lee – May 1993 WWW Newsletter**


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SEC Filing Form 10-K, Year 2014

| | |
|---|---|
| <ul style="list-style-type: none">• Google<ul style="list-style-type: none">- world leader in Search/Ads• #Times “royalt” appears 7<ul style="list-style-type: none">- NEVER in earnings, only in the litigations• Financial Data<ul style="list-style-type: none">- Total Revenues: 29 B- Sales of advertising: 89%<ul style="list-style-type: none">• Rest is sales in Market Place- Royalties: not even mentioned- Patents in Assets: 4B• US Patents: 6.688<ul style="list-style-type: none">• AN/Google AND ISD/\$/1994->\$/2014 | <ul style="list-style-type: none">• Pfizer<ul style="list-style-type: none">- world leader in Pharma• #Times “royalt” appears 28<ul style="list-style-type: none">- Several times in the financial explanation• Financial Data<ul style="list-style-type: none">- Total Revenues: 49 B- Sales of products: 92%<ul style="list-style-type: none">• Plus licensing agreement- Explicity royalties: 1B- Patents in Assets: 26.6B• US Patents: 2.460<ul style="list-style-type: none">• AN/Pfizer AND ISD/\$/1994->\$/2014 |
|---|---|


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SEC Filing Form 10-K, Year 2014 - cont

| | |
|---|---|
| <ul style="list-style-type: none">• Google<ul style="list-style-type: none">- We generate revenues primarily by delivering online advertising that consumers find relevant and that advertisers find cost-effective• IP Mentioned 32 times<ul style="list-style-type: none">- Mostly related to risk of litigation• Intellectual Property<ul style="list-style-type: none">- We have also filed patent applications in the US and foreign countries covering certain of our technology, and acquired patent assets to supplement our portfolio.• NO “significant” patents → because most software patents are not truly inventions, let alone “significant” inventions | <ul style="list-style-type: none">• Pfizer<ul style="list-style-type: none">- The majority of our revenues come from the manufacture and sale of biopharmaceutical products.• IP Mentioned 61 times<ul style="list-style-type: none">- Mostly related to protection• Intellectual Property<ul style="list-style-type: none">- Based on current product sales, and considering the vigorous competition with products sold by our competitors, the patent rights we consider most significant in relation to our business as a whole, ... are those for the medicines set forth in the table below.• 14 “significant” patents |
|---|---|


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Do numbers add up?

- **Google**
 - Patents in Assets: 4B
 - US Patents: 6.688
- **Is patenting worth?**
 - Average Value = 0.6M
 - Average Patenting Cost = 0.5M
 - Using Costs of World Patents
- **Why patenting so much rubbish?**
 - **Oct/2013**, Rockstar [Apple, Microsoft, BlackBerry, Sony, and Ericsson] sued Google, Samsung, LG, and HTC for infringement on ex-Nortel patents,
 - **Dec/2013** Google countersued...
 - **May/2014** End patent fights
 - No-one admitted infringing


- **Pfizer**
 - Patents in Assets: 26.6B
 - US Patents: 2.460
- **Is patenting worth?**
 - Average Value = 10.8M
 - Average Patenting Cost = 0.5M
 - Using Costs of World Patents
- **Definitely worth protecting!**
 - **2004** Wyeth sued Teva Pharma (IL) and Sun Pharma (IN) for selling generic copies of Protonix (a gastro protector)
 - **2013** Pfizer (acquirer of Wyeth in 2009) won 2.1B\$ settlement against Teva and Sun.
 - Both Teva and Sun admitted infringements.




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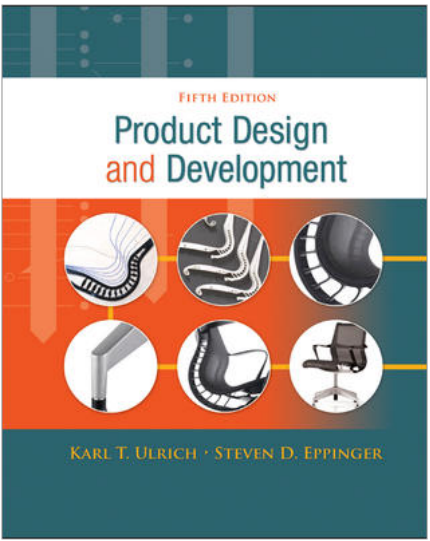
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Textbook

Product Design and Development
 Karl T. Ulrich and Steven D. Eppinger
 5th edition, Irwin McGraw-Hill, 2012

1. Introduction
2. Development Processes and Organizations
3. Opportunity Identification
4. Product Planning
5. Identifying Customer Needs
6. Product Specifications
7. Concept Generation
8. Concept Selection
9. Concept Testing
10. Product Architecture
11. Industrial Design
12. Design for Environment
13. Design for Manufacturing
14. Prototyping
15. Robust Design
- 16. Patents and Intellectual Property**
17. Product Development Economics
18. Managing Projects



KARL T. ULRICH · STEVEN D. EPPINGER

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Additional Reading



- <http://www.theverge.com/2014/6/19/5824144/supreme-court-rules-software-patents-that-cover-abstract-ideas-are>
- See material on web page of course