

Intellectual Property in the Digital Economy

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Copy protection (Decherney, 2012): Chains



Copy protection (Decherney, 2012): Sprocket holes



Copy protection: Serious Sam



- *Serious Sam 3* shooter game
- If pirated, in level 1 super fast, bulletproof scorpion-man-monster appears
- No way to proceed in the game...

Copy protection: Lenslok



- The Digital Economy?
- Digital technologies:
 - Information and communication technology (audiovisual, telecom, digital communication/data transmission, basic communication, computer technology, IT methods, semi-conductors)
 - Digital technology most important and transformative technology of past decades

- Impact of digital technologies:
 - Reduce cost of copying, storage, distribution of all forms of data (words, music, images etc.)
 - Transaction costs created by IP rights become relatively more important
 - Transformed the role of relevant IP
- Digital technologies bring IP into the day-to-day life of everyone!
- SME relevant — individual producers of creative work, programmers, small service providers, smartphone apps producers, technology start-ups etc.
- Business opportunities large for small firms — but complexity and increased transaction costs weigh most heavily on small firms
- But often enforcement of IP rights in digital markets difficult

- The Digital Economy?
- Digital technologies:
 - Challenge innovation models
 - Transforms IP rights
- Impact of digital technologies:
 - **Copyright**
 - **Patents** (software, business methods)
 - **Domain names**
 - Trademarks
 - Trade secrets (e.g. source code)
 - Designs
- Digital technologies challenge conventional wisdom on IP

- Digital technologies:
 - Create, transform, copy data
 - Digital technologies: transmission, display and analysis of data through **copying**
 - Create databases – possibility to store data
 - Variable costs of creating and disseminating copies close to zero
- Impact of digital technologies:
 - Instantaneous access to huge amounts of data
 - Routine copying of text, images and data

- New business models
 - Telecommunication operators no longer offer infrastructure, but also supply digital content
 - Smartphone apps market thriving market, populated by large number of small designers/companies
 - Video on demand market, availability on TV sets
 - Newspapers combine physical and online business models
 - ebooks are overtaking paperback books
 - Online aggregators (Google News, Everyblock)
- Technological change constantly creates new business models
- What happens to online publishing now that everyone has a tablet?
- What happens now that smartphones get faster and better at displaying data?

- Opportunities:
 - Internet based business
 - International markets accessible
- More opportunities:
 - Huge amount of information/data out there on customers, products, producers etc!
 - Text and data mining, search engine indexing, format shifting etc...
 - Important: these activities do **not** compete with the exploitation of the original work itself
 - Enormous amount of valuable business intelligence
 - Enormous business opportunity!
- Do IP rights help tap these opportunities?

- Copyright endows creators with temporary exclusive rights to their original creations
- Copyright is a trade-off between positive effects on incentives to creators and commercialization of content
- In practice, intermediaries dominate market: rights bought and commercialized by intermediaries, such as publishers
- Copyright is the right to own and use data
- Copyright has received important role in regulating digital technologies
- In digital economy: we are all daily copyright creators
- In digital economy: we are all pirates! Daily breach of copyright (e.g. shift piece of music from one device to another)

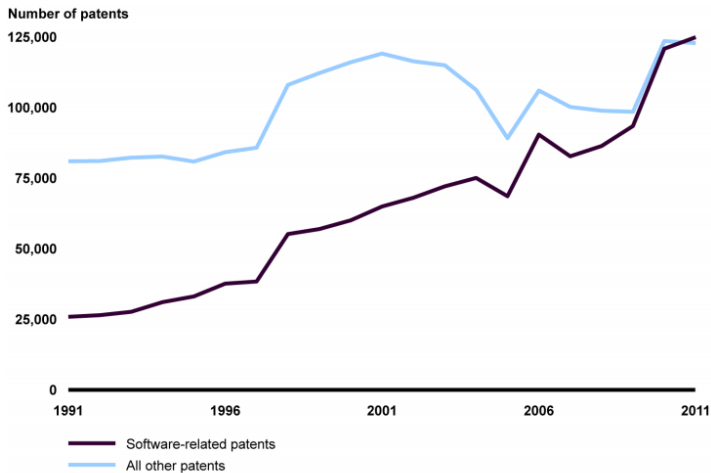
- *“The founders of Google have said they could never have started their company in Britain. The service they provide depends on taking a snapshot of all the content on the internet at any one time and they feel our copyright system is not as friendly to this sort of innovation as it is in the United States. Over there, they have what are called “fair use” provisions, which some people believe gives companies more breathing space to create new products and services.” (David Cameron, November 2010)*
- *“Clearing rights is a cumbersome and costly exercise, and it can be difficult to know who owns the rights to a given piece of content in the first place. Those problems are exacerbated for new entrants who want to aggregate content from multiple sources, possibly curating it in novel ways or layering value-added services on top of it.” (Pearson submission to Hargreaves Review)*

- Taking advantage of business opportunities can be difficult:
- Example: BBC claims took almost 5 years to assemble rights to launch iPlayer service (Hargreaves, 2011)
- Copyright can block or permit development and application of digital technology
- Challenges:
 - Unauthorized distribution of music through internet
 - What happens now (movies, video games) that smartphones get faster and better at displaying data?
 - How do IP rights regulate hyperlinking?

- How is access to licenses regulated?
- Access to bundled licenses nationally often difficult
- Access to licenses across jurisdictions difficult
- High transaction costs
- Mechanisms:
 - Collecting societies: facilitate licensing, reduce transaction costs, but potential detrimental effect on competition
 - Copyright exceptions (generally non-commercial uses): closed list of categories: criticism, news reporting, research, archiving
 - Fair use and fair dealing (but substantial uncertainty)
- Business opportunity: facilitate markets for copyright licensing

- Strong growth in patent filings in computer programs and telecommunication
- In part due to extension of patentable subject matter to software
- Most controversial area in patents: computer programs, digital communication/data transmission
- Consequences?

Software patents: Number of Software-Related Patents Granted per Year by USPTO, 1991-2011

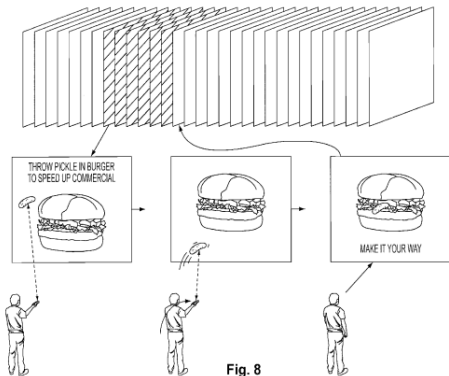


Source: GAO analysis of United States Patent and Trademark Office data.

Problems with software patents I

- ★ Central issue: patent **“quality”**
- Disclosure possibly insufficient

Disclosure (US8246454)



I claim:

1. A video image creation system comprising:
 - drafting means operable by an operator to designate points on a desired image;
 - means for producing first signals representing a characteristic to be imparted to the image at said points;
 - a store having storage locations corresponding to points on the image;
 - processing means for producing for each point designated by said drafting means a new image signal which is a function of said first signal and of a previous image signal for the same point derived from the location in said store corresponding to the respective point;
 - means for storing the new image signal at the location in said store corresponding to the respective point;
 - and
 - means for reading image signals from said store to produce an image corresponding to the stored signals.

Problems with software patents I

- ★ Central issue: patent **“quality”**
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- Functional claiming – “means/steps-plus-function” vs function itself (“a program that performs a function”, e.g. “A method for delivering interactive multimedia content”)

Functional claiming (Miller and Tabarrok, 2014)

United States Patent [19]

Dunworth et al.

[11] **Patent Number:** 5,930,474

[45] **Date of Patent:** Jul. 27, 1999

- [54] **INTERNET ORGANIZER FOR ACCESSING GEOGRAPHICALLY AND TOPICALLY BASED INFORMATION**
- [75] Inventors: **Peter D. Dunworth**, Huntington Beach; **John W. Veenstra**; **Joan Nagelkirk**, both of Balboa Island, all of Calif.
- [73] Assignee: **Z Land LLC**, Santa Ana, Calif.
- [21] Appl. No.: **08/595,026**
- [22] Filed: **Jan. 31, 1996**
- [51] **Int. Cl.⁶** **G06F 17/30**
- [52] **U.S. Cl.** **395/200.47; 707/10**
- [58] **Field of Search** **395/200.47, 200.48, 395/200.49; 707/4, 10, 103, 501**

[56] **References Cited**

PUBLICATIONS

author unknown, Yahoo! Company History, www.yahoo.com/info/misc/history.html, p. 1, Dec. 1994.

Mark Brown et al., Special Edition Using Netscape 2, pp. 182–207, Jan. 1995.

Yahoo Regional category, directory pages, pp. 1–3, Dec. 1994.

Newsbytes, Open Text Teams with Yahoo!, Newsbytes Inc., (Full text), Sep. 1995.

Dennis S. Arnon et al., Using Structured Documents for Implementing Product/Service Yellow Pages Architecture on the Internet, pp. 312–321, Dec. 1994.

Internet release announcing new “Get Local” service <http://>

Noglow, et al., “Coming Soon to a Town Near You: The LocalNet”, Hambrecht & Quist LLC Institutional Research, vol. 1, Issue 1, Nov. 1996.

Weintraut, et al., “The Internet: Webbing The Information Economy”, Hambrecht & Quist LLC Institutional Research, Sep. 22, 1995.

Screenshot of Home page for online yellow pages located at Internet address: WWW.bigbook.COM (6 pages), Jan. 1996.

Primary Examiner—Zarni Maung

Assistant Examiner—Patrice L. Winder

Attorney, Agent, or Firm—Knobbe, Martens, Olson & Bear LLP

[57] **ABSTRACT**

A software interface organizes information predicated upon the geographical area of the resources about which the information is desired. A user is presented with a “view-point” map which may comprise, for example, an actual visually displayed map of a selected geographical area, or text information which pertains to the resources associated with the selected geographical area. A geography database, a local content database and a yellow pages database are provided to allow the user to obtain information at different levels. The geography database allows the user to browse through different geographic areas of which are ordered hierarchically, while the local content database includes information about general goods and services available within a given geographic location and the yellow pages database includes information about specific goods and services in the geographic location. Thus, the user is provided with a means whereby information which is associated with particular geographic locations can be readily accessed.

Functional claiming – claims

What is claimed is:

1. A system which associates on-line information with geographic areas, said system comprising:
 - a computer network wherein a plurality of computers have access to said computer network; and
 - an organizer executing in said computer network, wherein said organizer is configured to receive search requests from any one of said plurality of computers, said organizer comprising:
 - a database of information organized into a hierarchy of geographical areas wherein entries corresponding to each one of said hierarchy of geographical areas is further organized into topics; and
 - a search engine in communication with said database, said search engine configured to search geographically and topically, said search engine further configured to elect one of said hierarchy of geographical areas prior to selection of a topic so as to provide a geographical search area wherein within said hierarchy of geographical areas at least one of said entries associated with a border geographical area is dynamically replicated into at least one narrower geographical area, said search engine further configured to search said topics within said selected geographical search area.
2. The system of claim 1, wherein said computer network is the internet.
3. The system of claim 1, wherein said computer network is a host-based computer system.
4. The system of claim 1, wherein said hierarchy of geographical areas define a virtual geographical environment.
5. The system of claim 1, wherein said hierarchy has a structure comprising plural hierarchical levels into which

SUMMARY OF THE INVENTION

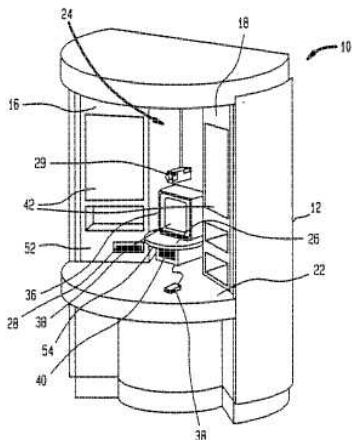
A user interface organizes information into a consistent presentation of menu selections and geographically organized information. Furthermore, at specified levels of the geographically organized information, the user is presented with the option of accessing topically organized information from among several topic selections, wherein the topical information is defined by the fact that the topical information is associated with a particular geographical area. Thus, a system and method for integrating geographically organized information with topical information is provided by the teachings of the present invention. The user interacts with the web organizer by choosing among menu selections using standard point-and-click techniques. The web organizer of the preferred embodiment translates the user's current menu selections into either a set of search engine queries that provide further menu selections, or a set of web destinations that satisfy the user's search criteria.

Problems with software patents I

- ★ Central issue: patent **“quality”**
- Claim-oriented format of patents is ill-suited to software
- Disclosure possibly insufficient
- Functional claiming – “means/steps-plus-function” vs function itself (“a program that performs a function”, e.g. “A method for delivering interactive multimedia content”)
- Incentives to disguise software patents
- Prior art search challenging (source code)

Disguising software (US5060171)

An image enhancement system and method includes means for superimposing a second image, such as a hair style image, over portions of a first image, such as an image of a person's face. The system or method further automatically marks locations along the boundary between the first and second images and automatically calls a graphic smoothing function in the vicinity of the marked locations, so the boundary between the images is automatically smoothed. Preferably, the smoothing function calculates a new color value for a given pixel in the vicinity of such a marked location in at least two smoothing steps, the first of which calculates the color value for each of a plurality of pixels adjacent to the given pixel by combining color values from pixels which are separated, respectively, from each of those plurality of pixels by a distance of more than one pixel. The second step calculates the new color value for the given pixel by combining the color value of each of the plurality of pixels. When used to superimpose hair styles, the system includes means for defining locations on the hair style image, means for defining locations on the head image, means for superimposing the hair style image on the head image so that the defined locations on the hair style image fit those on the head image; and means for altering the size of the hair style in horizontal and vertical directions without altering the fit of the defined locations on the hair style image to the defined locations on the head image. Preferably, in frontal images, both ears and the center of the hair line are used as the defined locations. In a side view, one ear and the center of the hair line are used as the defined locations.



Problems with software patents I

- ★ Central issue: patent **“quality”**
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- Incentives to disguise software patents
- Prior art search challenging (source code)
- ▶ Claim-oriented format of patents is ill-suited to software
- ▶ Legal uncertainty over scope and validity of patents
- ▶ Software has certain characteristics that inherently result in high likelihood of false positives in the patent grant decision

Problems with software patents II

- Software industry moving too fast for patents to be effective (short effective life of software)
- Cumulative/incremental and complex nature of technologies compounds problems
- Overlapping claims that create thickets
- R&D process in software distinct

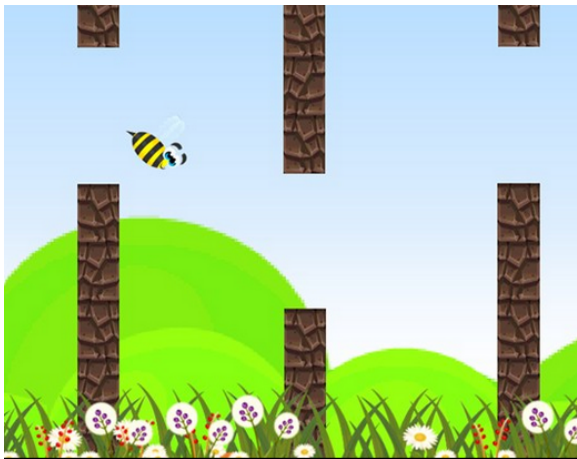
Share of patented apps in each of the app stores

Metric	Apple	Google	BlackBerry	Nokia	Windows
Apps <i>not</i> protected by patents	546,837	554,346	88,262	46,438	75,176
Apps protected by patents	212	392	192	30	48
Share protected by patents	0.04%	0.07%	0.22%	0.06%	0.06%

Apps and Patents: is there copying?



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Apps and Patents: is there copying?



Flappy Fins
Mindstorm S: FREE



Flappy Cat
Nexx Mobile: FREE



Flupp!
EntwicklerX: FREE



Flappy Turd
Zacatictac: FREE



Flappy bullet
AstraStudio: FREE



Flappy Fish
Otcacore: FREE



Flappy Craft
LongArm Inte: FREE



Flappy Craft!
Perfect Game: FREE



Flappy Turtle
Vinterm Gam: FREE



Flappy Stache
Team Chaos: FREE



Flappy Bee
Chinki Games: FREE



Flappy Pony
Rave Game N: FREE



Flappy Rainbow
Ostap Ostasc: FREE



Flappy Wings
Green Chili G: FREE



Flappy DragQueen
amandapps: FREE



Flappy Potato
Yugel Mobile: FREE



Flappy Tappy
Black Horizon: FREE



Flappy Dino
Feelingtouch: FREE

Apps and Patents: is there copying?

- Analyze Apple apps store subsample of 779 “innovative” apps
- Distribution of fast-following apps in relation to original apps

Number of fast-following apps	Cases of original apps
1 fast-follow	100
2 fast-follows	29
3 fast-follows	13
4 fast-follows	4
5 fast-follows	5
7–9 fast-follows	6
10–15 fast-follows	4
339 fast-follows	161

Examples of innovative apps and their fast-followers



Bejeweled

Publisher: PopCap Games

Price: \$0.99

Category: Games

Released: Nov 11, 2009

Bejeweled is a tile-matching puzzle video game by PopCap, first developed for browsers in 2001. Three follow-ups to this game have been released. More than 75 million copies of Bejeweled have been sold, and the game has been downloaded more than 150 million times.

PopCap Games initially announced a version of Bejeweled for the iPhone as a web application playable over the Safari browser. A native application for the iPhone was made later.

(Description from [Wikipedia](#).)

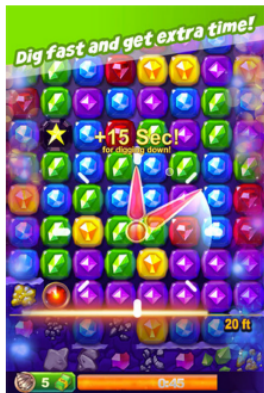
Examples of innovative apps and their fast-followers



Title: Linkoidz
Publisher: Retro Dreamer
Price: \$2.99
Released: Oct 26, 2010



Title: Piyo Blocks 2
Publisher: Big Pixel
Price: \$1.99
Released: Jul 8, 2010



Title: Ruby Blast™
Publisher: Zynga
Price: \$0.99
Released: Nov 15, 2012

Examples of innovative apps and their fast-followers



Camera+

Publisher: tap tap tap

Price: \$1.99

Category: Photo & Video

Released: June 7, 2010

Camera+ serves as an alternative to the standard iOS camera app, primarily adding basic and advanced editing tools (including special effects and lighting filters), an image stabilizer, and integrated sharing with social networks.

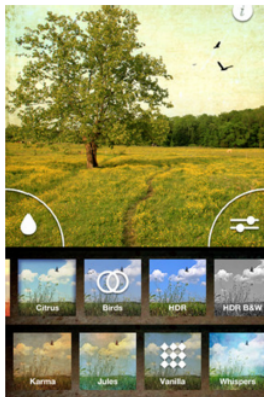
PC Advisor gave the app 4-and-a-half stars out of 5 and Wired gave it a 9 out of 10, describing it as a 'secret weapon' for photographers. In May 2012, Apple revealed that Camera+ was the 10th most popular paid app of all-time.

(Description from [Wikipedia](#).)

Examples of innovative apps and their fast-followers



Title: CameraBag 2
Publisher: Nevercenter
Price: \$0.99
Released: Feb 2, 2012



Title: Distressed FX
Publisher: We Are Here
Price: \$0.99
Released: Dec 13, 2012



Title: PicsPlay Pro
Publisher: JellyBus
Price: \$3.99
Released: Nov 16, 2012

Examples of innovative apps and their fast-followers



Living Earth

Publisher: Radiantlabs, LLC

Price: \$2.99

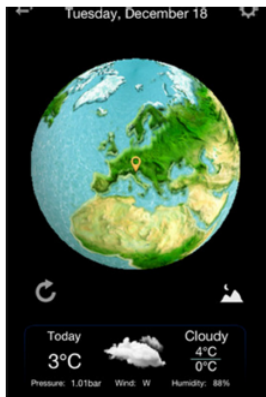
Category: Utilities

Released: August 17, 2010

The Living Earth app offers a live 3D simulation of our planet with global weather, forecasts and world clock for cities around the world with real-time 3D weather maps and typhoon and hurricane tracking.

WIRED Insider named it a 'must-have app' and said: "A stunning app that shows the Earth in real time, based on global weather reports." Chosen by Apple as the best iPhone and iPad Utility in App Store Rewind. Named by New York Times as a Top 10 iPad App.

Examples of innovative apps and their fast-followers



Title: 3D Earth Weather
Publisher: Shanshan Liu
Price: \$0.99
Released: Apr 4, 2012



Title: Live Weather Earth
Publisher: Divono LLC
Price: \$0.99
Released: Jun 13, 2012



Title: Living Globe
Publisher: Jinling Li
Price: \$1.99
Released: Feb 12, 2012

Examples of innovative apps and their fast-followers



Tiny Tower

Publisher: NimbleBit LLC

Price: Free

Category: Games

Released: June 23, 2011

Tiny Tower is a business simulation video game developed by NimbleBit for iOS and Android devices. In Tiny Tower, the player manages an expanding tower filled with virtual people, who are referred to as “bitizens”. The goal of the game is to build the tallest of towers, which will attract bitizens to move in and work in any floor the player designates.

iPhone Game of the Year by Apple in 2011.

(Description from [Wikipedia](#).)

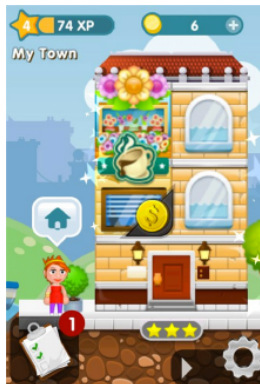
Examples of innovative apps and their fast-followers



Title: Dream Heights
Publisher: Zynga
Price: Free
Released: Jan 25, 2012



Title: Small Street
Publisher: Glu Games
Price: Free
Released: Jan 27, 2012



Title: Tower Town
Publisher: Crowdstar
Price: Free
Released: Nov 11, 2011

Sample of innovative apps being 'fast followed' in Apple's App Store

Category	Innovative apps in sample	Cases of 'fast follows'	Cases of leadtime advantage
Games	384	140 (36%)	79 (56%)
Music	36	23 (64%)	21 (91%)
Photo & Video	21	18 (86%)	16 (89%)
Books	42	21 (50%)	15 (71%)
Education	18	19 (106%)	14 (74%)
Entertainment	125	39 (31%)	10 (26%)
Other	153	79 (52%)	49 (62%)
Total	779	339 (44%)	204 (60%)

- Domain name system (DNS): internet address that locates website
- Top-level **domains**: .com, .int, .co.uk, etc...
- New generic top-level domains: .apple, .pizza etc.
- Private contract (coordinator ICANN)
- Identifies owner of website
- Choosing the right name big competitive advantage!
- International right
- First-to-file system, no examination
- Creates strategic options (and incentives for squatting)
- Some restrictions imposed by ICANN (“bad faith”)

- Interaction of domain names and other IP rights
- Domain names & trademarks
- Problematic overlap occurs when trade name or trademark part of second-level domain name
- Trademark infringement disputes outside of ICANN's remit
- But ICANN's [Trademark Clearinghouse](#)
- Administrative proceeding available under Uniform Domain Name Dispute Resolution Policy (UDRP)
- .com, .org and .net domain names subject to U.S. Anti-cybersquatting Consumer Protection Act (ACPA)

- The Digital Economy?
- Hugely disruptive
 - Technologically
 - Business models and opportunities
 - Functioning and use of IP rights
- SMEs especially affected by all 3 factors...

- Decherney P. (2012). Hollywood's Copyright Wars. Columbia University Press.
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