

Patent mining :
Les brevets comme source de veille technologique

Nicolas van Zeebroeck
Questions Actuelles d'Informatique
ULB, 27/4/2010

Patent mining

- Condensé d'économie de la connaissance
 - Les rôles du brevet dans l'entreprise
- Veille concurrentielle et technologique
- Bases de données de brevets
- Outils et techniques
- Que peut-on en apprendre?

Patent mining

Condensé d'économie de la connaissance

Economie de la connaissance: un aperçu

- Connaissance = ?



Economie de la connaissance: un aperçu

- Les multiples facettes de la connaissance
 - Information that is useful and exploitable in a given context
 - An object and a meaning (Spender and Marr, 2005)
 - The intangible part of a firm's assets
 - Explicit (codified) v. tacit (Polanyi, 1966)
 - Technical v. organizational
 - Observable (e.g. products) v. non observable (e.g. processes) (Teece, 2005)
 - Positive (of success) v. negative (of failure) (Teece, 2005)
 - Replicability, imitability, appropriability, observability (e.g. products v. processes)
 - Positivist, interpretive, organic (Marr and Spender, 2004)
 - Mentally stored knowledge in the minds of employees v. policies, routines, documents, identity, culture, and systems (Alavi and Leidner, 2001)

5 | N. van Zeebroeck – Patent mining – 27/4/2010



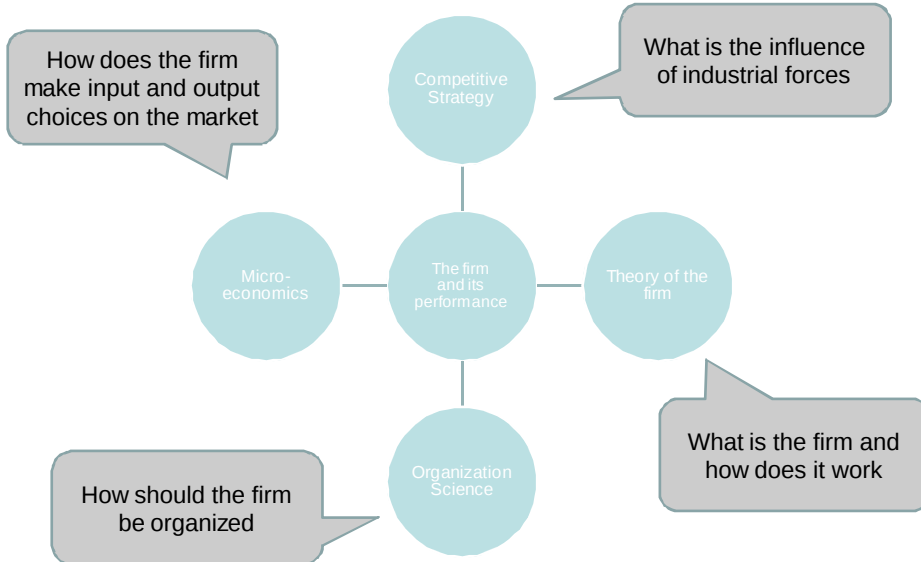
Economie de la connaissance: un aperçu

- Celle qui nous intéresse ici: la connaissance technologique
 - Ensemble des
 - processus de fabrications
 - produits (intermédiaires ou finis)
 - applications ou usages (des produits)
 - mis en oeuvre ou fournis par l'entreprise
 - C'est à dire, grossièrement, les inventions

6 | N. van Zeebroeck – Patent mining – 27/4/2010



Economie de la connaissance: un aperçu



7 | N. van Zeebroeck – Patent mining – 27/4/2010



Economie de la connaissance: un aperçu

- La théorie de la firme
 - Expliquer les sources d'avantages concurrentiels
 - Plusieurs vues de l'entreprise
 - The behavioral view (Cyert & March, 1963)
 - The evolutionary view (Nelson & Winter, 1982)
 - The resource-based view (Wernerfelt, 1984; Barney, 1991, 2001)
 - Firm performance depends on exploitation of exclusive assets
 - Long-term advantage can be maintained by protecting the organization against resource imitation, loss, transfer, or substitution
 - **The knowledge-based view** (Grant, 1996; Spender, 1996)

8 | N. van Zeebroeck – Patent mining – 27/4/2010



Economie de la connaissance: un aperçu

- Knowledge-based view
 - Information that is useful and exploitable in a given context
 - Knowledge is the most important asset
 - Sustainability requires resources idiosyncratic (hence scarce) and difficult to transfer or replicate (Grant, 1991)
 - Firms are institutions that integrate individual (specialized) knowledge (Grant, 1996)
 - Structure and systems of the firm = isolating mechanisms to protect knowledge-based rents (Liebeskind, 1996)
 - Long-term competitive advantage can be obtained by collecting and sharing expert or innovative knowledge (Argote and Ingram, 2000; Lee and Choi, 2003)
 - **Sustainable competitive advantage flows from the creation, ownership, protection and use of difficult to imitate knowledge assets, which need to be usable and transferable within the firm, but difficult for outsiders to access or recreate** (Teece, 2000)
 - The importance of knowledge assets to competitive advantage is determined by firm structures and industrial contexts (Teece, 2000)

9 | N. van Zeebroeck – Patent mining – 27/4/2010



Economie de la connaissance: un aperçu

- Le dilemme de la gestion de la connaissance
 - Maximiser sa diffusion, sa persistance et son exploitation internes
 - Minimiser sa fuite et son exploitation externes
 - L'objectif de la gestion de la connaissance est donc
 - De faciliter les flux entrants et internes
 - De maximiser la préservation (donc le partage et/ou la formalisation)
 - Comment la rendre résistante au départ des employés qui la détiennent?
 - De limiter au maximum les flux sortants et externes
 - La principale difficulté:
 - Maximiser la diffusion/formalisation interne
 - ➔ augmenter le risque de fuite externe

10 | N. van Zeebroeck – Patent mining – 27/4/2010



Economie de la connaissance: un aperçu

- Information is non-excludable
 - Impossible to exclude a user, even if the latter did not contribute to its 'funding'
 - A publisher cannot prevent you from sharing books, music
 - Journalists use the ideas of other journalists
 - Lack of motivation to create information: collective loss!!
- Information is non-rival
 - Using it does not preclude others to use it
 - Watching a football match on TV does not preclude others to watch it
 - Reverse of congestion: going to the football match...
 - The additional cost of an additional consumer is ZERO

11 | N. van Zeebroeck – Patent mining – 27/4/2010



Economie de la connaissance: un aperçu

- Non-exclusion et non-rivalité: un défi économique
 - Entraînent qu'une fois réalisée, une invention se diffuse
 - Peut-être exploitée par des tiers qui n'ont pas eu à encourir les coûts de développement
 - Désavantage majeur pour l'inventeur qui se trouve pénalisé
 - ➔ Recherche risque de toujours profiter aux autres

12 | N. van Zeebroeck – Patent mining – 27/4/2010



Economie de la connaissance: un aperçu

- Social welfare?
 - L'intérêt du 'social planner' est double, et contradictoire
 - Que les inventions (bénéfiques aux consommateurs) soient réalisées
 - Que les produits soient vendus aux prix les plus bas possible

Economie de la connaissance: un aperçu

- Solution? De manière séquentielle
 1. Monopole temporaire, garanti par l'Etat, pour l'inventeur
 2. Description détaillée de l'invention pour qu'elle puisse se diffuser
 3. A l'expiration du monopole: concurrence joue à plein régime (exemple: les médicaments génériques)

= BREVET

Economie de la connaissance: un aperçu

- Qu'est-ce qu'un brevet?
 - Un document légal
 - Qui confère un droit exclusif temporaire (20 ans max.)
 - Càd le droit d'exclure, pas celui d'utiliser
 - Sur une invention technique nouvelle
 - Càd non-évidente pour une personne compétente dans le domaine
 - Càd jamais publiée ou diffusée avant le dépôt de la demande de brevet
 - Susceptible d'une application industrielle
 - Décrite de manière suffisamment détaillée
 - Pour permettre à une personne compétente dans le domaine de la reproduire
 - C'est donc
 - Un moyen légal d'appropriation et de protection de la connaissance
 - En échange de la divulgation complète de son invention

15 | N. van Zeebroeck – Patent mining – 27/4/2010



Economie de la connaissance: un aperçu

Avantages du brevet

- Exclusivity enables investment and higher returns on investment
- Strong, enforceable legal right
- Makes invention tradable (licensing)

Disadvantages

- Reveals invention to competitors (after 18 months)
- Can be expensive
- Patent enforceable only after grant (this can take 4-5 years)

16 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Economie de la connaissance: un aperçu

Alternatives to patenting

Information disclosure (defensive publishing)

- | | |
|--|--|
| <ul style="list-style-type: none"> • Cheap • Prevents others from patenting the same invention | <ul style="list-style-type: none"> • Does not offer exclusivity • Reveals the invention to competitors |
|--|--|

Secrecy (creating a trade secret)

- | | |
|---|---|
| <ul style="list-style-type: none"> • Cheap (but there is the cost of maintaining secrecy) • Does not reveal the invention | <ul style="list-style-type: none"> • No protection against reverse-engineering/duplication of invention • Difficult to enforce • "Secrets" often leak quite fast |
|---|---|

Do nothing

- | | |
|--|--|
| <ul style="list-style-type: none"> • No effort required | <ul style="list-style-type: none"> • Does not offer exclusivity • Competitors will often learn details |
|--|--|

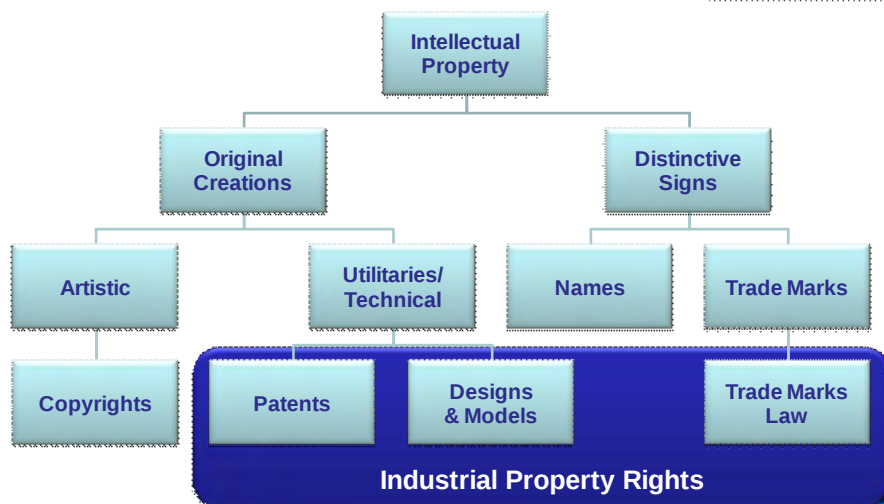
17 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Economie de la connaissance: un aperçu

Secrecy

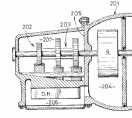


18 | N. van Zeebroeck – Patent mining – 27/4/2010



Economie de la connaissance: un aperçu

Legal right	What for?	How?
Patents	New inventions	Application and examination
Copyright	Original creative or artistic forms	Exists automatically
Trade marks	Distinctive identification of products or services	Use and/or registration
Registered designs	External appearance	Registration
Trade secrets	Valuable information not known to the public	Reasonable efforts to keep secret



19 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Economie de la connaissance: un aperçu

Trade marks:

- Made by "Nokia"
- Product "N95"
- Software "Symbian", "Java"

Patents:

- Data-processing methods
- Semiconductor circuits
- Chemical compounds
- ...

Copyrights:

- Software code
- Instruction manual
- Ringtone
- ...



© Nokia

Trade secrets:

?

Designs (some of them registered):

- Form of overall phone
- Arrangement of buttons in oval shape
- Three-dimensional wave form of buttons
- ...

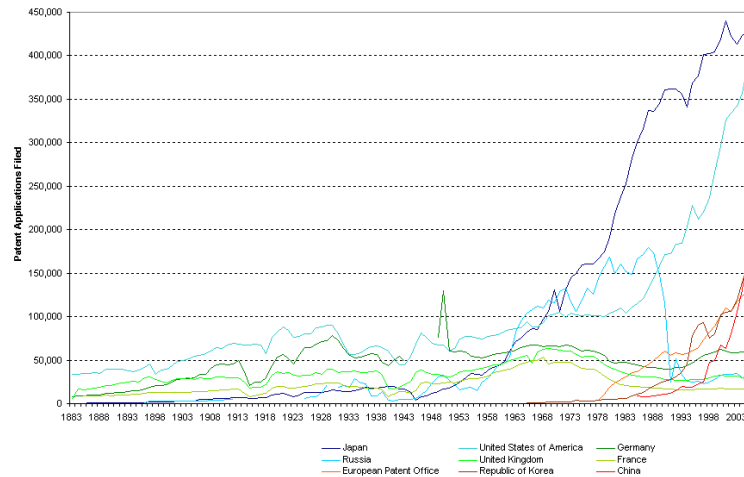
20 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Economie de la connaissance: un aperçu

- Economie de la connaissance → Popularité du brevet



Filing rates at selected patent offices

Source: EPO Patent Teaching Kit (2010)



21 | N. van Zeebroeck – Patent mining – 27/4/2010

Economie de la connaissance: un aperçu

- Que contient un brevet?
 - Bibliographic information
 - Inventor, proprietor, date of filing, technology class, title, etc.
 - Abstract
 - Around 150 words as a search aid for other patent applications
 - Description
 - Summary of prior art (i.e. the technology known to exist)
 - The problem that the invention is supposed to solve
 - An explanation and at least one way of carrying out the invention
 - Claims
 - Define the extent of patent protection
 - Drawings
 - Illustrate the claims and description

Source: EPO Patent Teaching Kit (2010)



22 | N. van Zeebroeck – Patent mining – 27/4/2010

Economie de la connaissance: un aperçu

 Europäisches Patentamt European Patent Office Office européen des brevets	 Publication number: 0 201 184 B1
EUROPEAN PATENT SPECIFICATION	
Date of publication of patent specification: 16.12.92 Int. Cl. ⁵ C12P 19/34, C12N 15/10, //C12Q1/68,C07H21/00	
Application number: 86302299.2	
Date of filing: 27.03.86	
Divisional application 92201226.5 filed on 27/03/86.	
Process for amplifying nucleic acid sequences.	
Priority: 28.03.85 US 716975 25.10.85 US 791308	Proprietor: F. HOFFMANN-LA ROCHE AG Postfach 3255 CH-4002 Basel(CH)
Date of publication of application: 17.12.86 Bulletin 86/46	Inventor: Mullis, Kary Banks 447 Beloit Avenue Kensington California 94708(US)
Publication of the grant of the patent: 16.12.92 Bulletin 92/51	

23 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Economie de la connaissance: un aperçu

- En bref...
 - Connaissance devient principale source d'avantage concurrentiel
 - Nécessité impérieuse de la protéger / approprier
 - Instrument légal privilégié pour ce faire: le brevet
 - Droit exclusif (monopole) sur une invention
 - En échange de sa divulgation (description) complète et publique
 - Devient de plus en plus populaire
 - Environ 200.000 brevets déposés chaque année à l'OEB (sans compter les centaines de milliers aux USA, JP ou... en Chine)
 - Constitue dès lors à la fois
 - Un mécanisme de protection
 - Une source d'information inépuisable

24 | N. van Zeebroeck – Patent mining – 27/4/2010



Patent mining

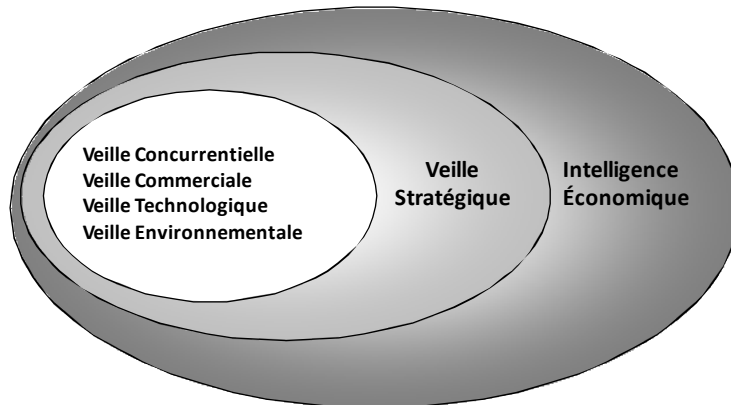
Veille concurrentielle et technologique
(Business intelligence)

Veille concurrentielle et technologique

- En quoi consiste la gestion de brevets?
 - Patent strategy
 - Offensive/defensive
 - Internationalisation
 - Kind of exploitation: licensing or own use
 - **Patent information**
 - Keep abreast of technology
 - Avoid infringing patents
 - Understand the competitive landscape
 - Communication
 - Compile convincing evidence that your patents are valuable
 - Inform investors and banks, clients and prospective employees
 - Maintenance
 - Pay renewal fees, observe deadlines
 - Strengthen important patents and get rid of ones with no value

} Veille technologique
et concurrentielle

Veille concurrentielle et technologique



Les entreprises qui réussissent le mieux dans le lancement de nouveaux produits montrent une grande corrélation entre «stratégie innovantes» et fréquence d'application de la veille stratégique. (Ahituv, Zif, Machlin ;1998)

27 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: I. Boulifa



Veille concurrentielle et technologique

- Veille concurrentielle

Quoi: les concurrents et leur(s)

- Stratégie
- Politique tarifaire
- Nouveaux produits ou services
- Résultats financiers
- Recrutements
- Clients, nouveaux contrats
- Communiqués ou articles de presse
- Accords, partenariats, rachats,...

Comment:

- Internet, site web
- Rapports d'activité
- Bilans d'entreprises
- Documentation commerciale
- Achats de produits
- Revues, Magazines
- Brevets

Pourquoi:

- Identifier les concurrents les plus menaçants
- Identifier l'apparition de nouveaux concurrents
- Ajuster son argumentation commerciale
- Mettre en place des stratégies commerciales plus efficaces

28 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: CENTREDOC (2003)



Veille concurrentielle et technologique

- Veille technologique

Quoi: l'environnement technologique

- Les dépôts de brevets
- L'évolution des normes
- L'évolution des technologies
- Les procédés de fabrication
- La recherche fondamentale

Comment:

- Banques de données brevets
- Littérature scientifique
- Thèses
- Organes de normalisations
- Rapports scientifiques

Pourquoi:

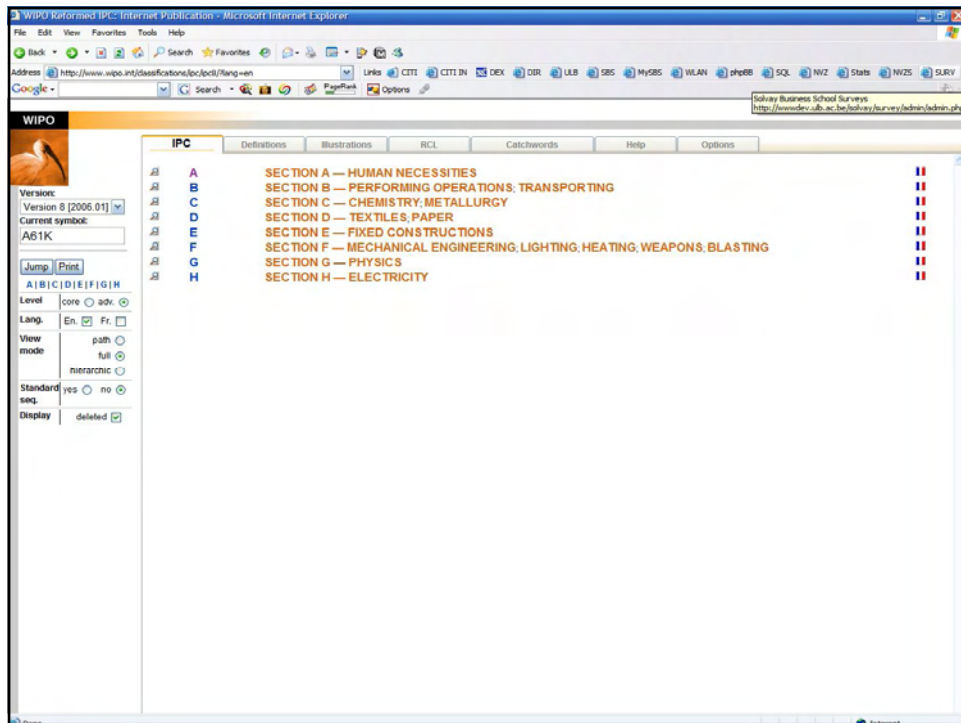
- Détecter les technologies de substitution
- Détecter des niches technologiques
- Surveiller l'activité innovante des concurrents
- Valoriser la R&D (brevets)
- Orienter la R&D
- Orienter la recherche de partenaires technologiques

Veille concurrentielle et technologique

- Pourquoi s'intéresser aux brevets?

- Pour ne pas réinventer la roue
 - 25% de la R&D gaspillée pour réinventer des inventions existantes
- Pour découvrir les technologies des concurrents ou émergentes
 - 80% de la technologie publiée dans les brevets ne l'est nulle part ailleurs
 - Et elle est libre de droits dans 90% des cas (brevets refusés ou périmés)
- Pour évaluer sa liberté d'entreprendre (freedom to operate)
 - N'êtes-vous pas en train d'enfreindre le brevet d'un autre?
- Pour découvrir vos concurrents (et contrevenants) potentiels
 - Qui dépose des brevets dans le même domaine que vous?

ULB





Patent mining

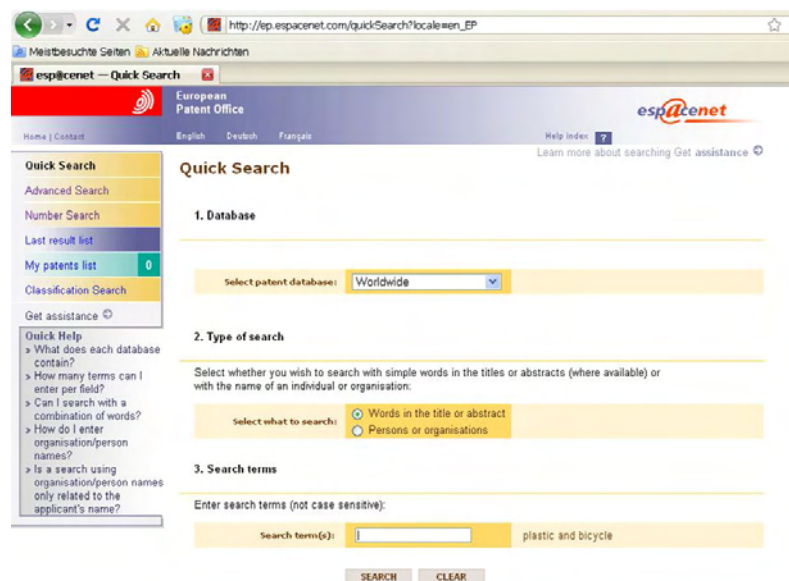
Bases de données de brevets



Bases de données

- Différentes bases de données existent (exemples)
 - Celles des Offices de Brevets
 - USPTO: <http://patft.uspto.gov/netahtml/PTO/search-bool.html>
 - EPO (couverture mondiale)
 - Online: <http://ep.espacenet.com/>
 - Offline: Patstat (<http://www.epo.org/patents/patent-information/raw-data/test/product-14-24.html>)
 - D'autres bases en accès public
 - Google Patents: <http://www.google.com/patents>
 - Bases de données commerciales
 - Thomson Reuters' Delphion: <http://www.delphion.com/>

Bases de données



The screenshot shows the EPO Quick Search interface in a web browser. The browser's address bar displays the URL http://ep.espacenet.com/quickSearch?locale=en_EP. The page header includes the EPO logo, the text "European Patent Office", and the "esp@cenet" logo. A navigation bar contains links for "Home", "Contact", and language options: "English", "Deutsch", and "Français". A "Help Index" link is also present. The main content area is titled "Quick Search" and is divided into three sections: 1. Database, 2. Type of search, and 3. Search terms. In the "Database" section, a dropdown menu for "Select patent database:" is set to "Worldwide". In the "Type of search" section, a label asks to "Select what to search:", with two radio button options: "Words in the title or abstract" (which is selected) and "Persons or organisations". In the "Search terms" section, a label asks to "Enter search terms (not case sensitive):", followed by a text input field containing "plastic and bicycle". Below the input field are "SEARCH" and "CLEAR" buttons. A left sidebar contains a "Quick Search" menu with options: "Quick Search", "Advanced Search", "Number Search", "Last result list", "My patents list" (showing 0 results), and "Classification Search". Below this is a "Get assistance" link and a "Quick Help" section with several questions and answers regarding database content, search terms, and search methods.

Bases de données

37 | N. van Zeebroeck – Patent mining – 27/4/2010

ULB

Bases de données

38 | N. van Zeebroeck – Patent mining – 27/4/2010

ULB

Bases de données

- 2 types de recherche: mot-clé ou classe technologique?

Keyword searches

- Patent applicants don't use a common language
 - Legal implications
 - Scope of protection
 - Hide from competitors
- Hard to find the right keywords
- Good results usually require professional patent search experience

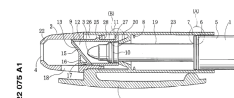
Technology class searches

- Each patent classified by patent professionals
- IPC is hierarchical and very detailed: you can gradually narrow down searches
- Descriptions of classes written in such a way as to be easily found and understood
- Little experience required
- BUT: IPC classes won't match your needs 100%

Patent jargon

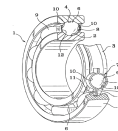
writing instrument

= pen



a plurality of balls

= ball bearing



**spherical object
with floppy filaments
to promote sure capture**

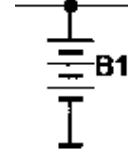
= toy ball



Patent jargon in electronics

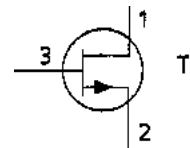
electrical power source for electronic circuits

= battery



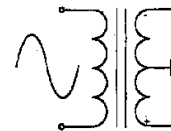
semiconductor switching device with a control electrode

= transistor



galvanically isolated electrical coupling means

= transformer



41 | N. van Zeebroeck – Patent mining – 27/4/2010

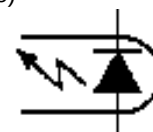
Source: EPO Patent Teaching Kit (2010)



Patent jargon in electronics

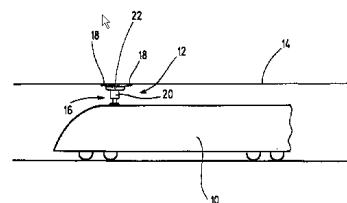
photo-transmitting device

= LED (light-emitting diode)



arrangement for tapping power from an electrical cable

= current collector



42 | N. van Zeebroeck – Patent mining – 27/4/2010

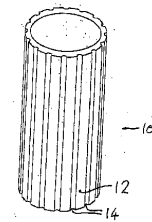
Source: EPO Patent Teaching Kit (2010)



Patent jargon in general technology

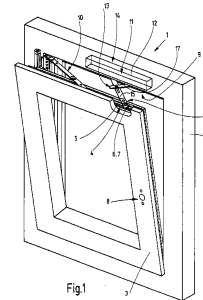
elongate member

= pipe, riser, cable or optical fibre



wing

= door or window



43 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Patent jargon in chemistry

- water- and oil-repellent surface
- water-soluble or water-dispersible polymer
- superabsorbent
- expanded styrenic (co)polymer
- polyisoprene
- ionomer
- graft copolymer of vinyl aromatic monomers on a butadiene rubber
- aromatic polyester

Teflon®

polyacrylic acid (salt) or polyvinyl alcohol

gel of polyacrylic acid (salt)

polystyrene foam; Styrofoam®

natural rubber

copolymer of ethylene and salts of acrylic acid

ABS (the plastic of which LEGO bricks are made)

PET (polyethylene terephthalate)

44 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Classification search

**European Patent Office**
Home | Contact English Deutsch Français



Quick Search
Advanced Search
Number Search
Last result list
My patents list 0
Classification Search
Get assistance

How do I use the Classification search? Get assistance

Search the European classification

View Section	Find classification(s) for keywords	Find description for a symbol
Index A B C D E F G H Y	e.g. mast sail Go	e.g. A23C Go

Next page: A

HUMAN NECESSITIES	A ☐
PERFORMING OPERATIONS; TRANSPORTING	B ☐
CHEMISTRY; METALLURGY	C ☐
TEXTILES; PAPER	D ☐
FIXED CONSTRUCTIONS	E ☐
MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING ENGINES OR PUMPS	F ☐
PHYSICS	G ☐
ELECTRICITY	H ☐
GENERAL TAGGING OF NEW TECHNOLOGICAL DEVELOPMENTS [N0403]	Y ☐

☐ show notes Copy to searchform:

45 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Wanted: air-conditioning technology for buses

Search the European classification

View Section	Find classification(s) for keywords	Find description for a symbol
Index A B C D E F G H Y	(bus* or coach*) air c Go	e.g. A23C Go

Next page: A

HUMAN NECESSITIES	A ☐
PERFORMING OPERATIONS; TRANSPORTING	B ☐
CHEMISTRY; METALLURGY	C ☐
TEXTILES; PAPER	D ☐
FIXED CONSTRUCTIONS	E ☐
MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING ENGINES OR PUMPS	F ☐
PHYSICS	G ☐
ELECTRICITY	H ☐
GENERAL TAGGING OF NEW TECHNOLOGICAL DEVELOPMENTS [N0403]	Y ☐

☐ show notes Copy to searchform:

46 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Detailed view of a technology class

Previous page: [B60H](#) Next page: [B60H3/00](#)

PERFORMING OPERATIONS; TRANSPORTING ☐ **B**

VEHICLES IN GENERAL ☐ **B60**

ARRANGEMENTS OR ADAPTATIONS OF HEATING, COOLING, VENTILATING, OR OTHER AIR-TREATING DEVICES SPECIALLY FOR PASSENGER OR GOODS SPACES OF VEHICLES ☐ **B60H**

Heating, cooling or ventilating devices (heating, cooling or ventilating devices providing other air treatment, the other treatment being relevant, [B60H3/00](#), ventilating solely by opening windows, doors, roof parts, or the like [B60J](#), vehicle window or windscreen cleaners using air, e.g. defrosters, [B60S1/54](#)) ☐ **B60H1**

☐ show notes

☐ [N: Combined heating, ventilating, or cooling devices (control systems or mechanisms) [B60H1/00A](#) ☐

☐ [N: for load cargos on load transporting vehicles] [B60H1/00A1](#) ☐

☐ [N: disposed in front of the passenger compartment] [B60H1/00A2](#) ☐

☐ [N: Constructional lay-out of the devices in the vehicle] [N9604] [B60H1/00A2A](#) ☐

☐ [N: for sending an air stream of uniform temperature into the passenger compartment] [N9604] [B60H1/00A2B](#) ☐

☐ [N: the air passing only one heat exchanger] [N9604] [B60H1/00A2B1](#) ☐

☐ [N: the air being firstly cooled and subsequently heated or vice-versa] [N9604] [B60H1/00A2B2](#) ☐

☐ [N: the air being heated and cooled simultaneously, e.g. using parallel heat exchangers] [N9604] [B60H1/00A2B3](#) ☐

☐ [N: for sending air streams of different temperatures into the passenger compartment] [N9604] [B60H1/00A2C](#) ☐

☐ [N: the air passing only one heat exchanger] [N9604] [B60H1/00A2C1](#) ☐

☐ [N: the devices being independent of the vehicle] [B60H1/00B](#) ☐

☐ [N: non-transportable devices, disposed outside the vehicle, e.g. on a parking] [B60H1/00B1](#) ☐

☐ [N: Transportable devices] [B60H1/00B2](#) ☒

47 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Adding further criteria to your search

Select patent database:

2. Search terms

Enter keywords in English

Keyword(s) in title:	plastic and bicycle
Keyword(s) in title or abstract:	hair
Publication number:	WO03075629
Application number:	DE19971031696
Priority number:	WO1995US15925
Publication date:	yyyyymmdd
Applicant(s):	Institut Pasteur
Inventor(s):	Smith
European Classification (ECLA):	B60H1/00B2
International Patent Classification (IPC):	F03G7/10
	H03M1/12

Only applications published in a certain year?

Only applications by certain inventors?

European Classification (ECLA):

48 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



esp@cenet result list

☐ Compact ☐ Print ☐ Export

Refine search | 1 next

RESULT LIST

Approximately 143 results found in the Worldwide database for:
B60H1/00B2 as the European Classification
(Results are sorted by date of upload in database)

The result is not what you expected? [Get assistance](#)

- | | | |
|---|--|---|
| 1 | Vorrichtung zum Warmhalten von Speisen in Kraftfahrzeugen | in my patents list ☐ |
| | Inventor:
EC: B60H1/00B2; B60H1/22A3
Publication info: DE202008002890 (U1) — 2008-05-15 | Applicant: JAKUBITZ LUTZ WOLFGANG [DE]
IPC: B60H1/22; A47B31/02; B60P3/025; (+5) |
| 2 | Refrigeration Apparatus and Vehicle Incorporating the Same | in my patents list ☐ |
| | Inventor: JACKSON PETER MAITLAND [GB]
EC: B60H1/00B2; B60H1/32S; (+3)
Publication info: GB2442739 (A) — 2008-04-16 | Applicant: L E JACKSON [GB]
IPC: B60H1/32; F25D3/06; B60H1/32; (+1) |
| 3 | AIR-CONDITIONING SYSTEM FOR STANDSTILL AIR-CONDITIONING OF A MOTOR VEHICLE | in my patents list ☐ |
| | Inventor: PFALZGRAF MANFRED [DE];
BEDENBECKER MARKUS [DE] (+2)
EC: B60H1/00H4; B60H1/00B2
Publication info: WO2008037242 (A1) — 2008-04-03 | Applicant: WEBASTO AG [DE]; PFALZGRAF MANFRED [DE] (+3)
IPC: B60H1/00; B60H1/00 |
| 4 | COMPOSITIONS AND METHODS FOR ELIMINATING AND PREVENTING | in my patents list ☐ |

Self-contained refrigeration unit

Bibliographic data	Description	Claims	Mosaics	Original document	INPADOC legal status
Publication number: EP1308330 (A1) Publication date: 2003-05-07 Inventor(s): MATONOG PHILIPPE [FR]; PETIT XAMIER [US] Applicant(s): CARRIER CORP [US] Classification: - international: B60H1/00; B60H1/32; B60P3/20; F25D19/00; B60H1/00; B60H1/32; B60P3/20; F25D19/00; (IPC1-7): B60H1/32 - European: B60H1/00B2; B60H1/00H1; B60H1/32C11; B60P3/20 Application number: EP20020257383 20021024 Priority number(s): US20010021573 20011030	Also published as: EP1308330 (B1) US2004187507 (A1) US2003079487 (A1) ES2256417 (T3) DE60208762 (T2) more >> Cited documents: WO0065288 (A1) US6279334 (B1) US2766439 (A) US5438642 (A) DE19641642 (A1) Report a data error here	View INPADOC patent family View list of citing documents View document in the European Patent Office	Abstract of EP 1308330 (A1) A removable self-contained refrigeration unit 12 is mounted within a vehicle 10, and is removable from a vehicle as a unit. The casing 14 mounts both the evaporator 42 and the condenser 34, and in one embodiment also mounts the compressor 46. With the embodiment that mounts the compressor 46, no refrigerant lines need be found anywhere except on the casing 14. The casing 14 is removable from the vehicle as a one piece unit merely by connecting or disconnecting electrical connections 31A,31B. In a second embodiment (Fig. 5) the compressor 53 is mounted remotely from the casing 14 but the evaporator 42 and condenser 34 are still changeable as a one piece unit 12. In this embodiment a refrigerant connection 50 need also be connected or disconnected to change the unit.		

View list of citing documents

Citing documents
for EP0200362
(PCR, invented by
Nobel Laureate
Kary Mullis)

European Patent Office
Home | Contact | English | Deutsch | Français

Quick Search
Advanced Search
Number Search
Last result list
My patents list 0
Classification Search
Get assistance

Quick Help
What are citing documents?
What is the difference between "cited documents" and "citing documents"?
Why do some documents not have any citing documents?

Compact | Print | Very influential! | 1 2 3 4 5 next

LIST OF CITING DOCUMENTS
Approximately 121 document citing EP0200362

1 Isothermal strand displacement nucleic acid amplification in my patents list
Inventor: DATTAGUPTA NANIBHUSHAN (US); Applicant: GEN PROBE INC (US)
STULL PAUL DOUGLAS (US); (+2)
EC: IPC: C12P19/34; C07H21/02; C07H21/04 (+4)
Publication info: USRE39007E - 2006-03-07

2 Isothermal strand displacement nucleic acid amplification in my patents list
Inventor: DATTAGUPTA NANIBHUSHAN (US); Applicant: GEN PROBE INC (US)
STULL PAUL DOUGLAS (US); (+2)
EC: IPC: C12P19/34; C07H21/02; C07H21/04 (+6)
Publication info: USRE38960E - 2006-01-31

3 AUTOMATABLE QUICK TEST FOR DIRECT DETECTION OF APC RESISTANCE MUTATION WITH SPECIFIC PRIMERS AND ASSAY in my patents list
Inventor: SPRINGER WOLFGANG (DE) Applicant: BAYER AG (DE); SPRINGER WOLFGANG (DE)
EC: C12Q1/68D2G; C12Q1/68M6 IPC: C12Q1/68; C12Q1/68; (IPC1-7): C12Q1/68
Publication info: WO0024928 - 2000-05-04

4 NOVEL PRIMER AND USE THEREOF in my patents list
Inventor: IMAMURA MIO (JP); ITAGAKI YASUHARU Applicant: SNOW BRAND MILK PROD CO LTD (JP); IMAMURA MIO (JP); (+2)
EC: C07K14/47A21; C07K14/47A28; (+1) IPC: C12N15/09; C07K14/47; C12Q1/68 (+5)
Publication info: WO9913065 - 1999-03-18

5 Proteins with urease activity in my patents list
Inventor: LABIGNE AGNES (FR) Applicant: INST PASTEUR AND I NAT DE LE S (FR)
EC: C07K16/40; C12N9/80; (+1) IPC: A61P31/04; C07K16/40; C12N9/80 (+12)
Publication info: US86146634 - 2000-11-14

6 Quantitative PCR using blocking oligonucleotides in my patents list

51 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



View or print original document

Self-contained refrigeration unit

Bibliographic data | Description | Claims | Mosaics | Original document | INPADOC legal status

1 / 11 | 46,2% | Suchen

Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 308 330 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication: 07.05.2003 Bulletin 2003/19

(21) Application number: 02257883.6

(22) Date of filing: 24.10.2002

(84) Designated Contracting States: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IT LI LU MC NL PT SE SK TR Designated Extension States: AL LT LV MK RO SI

(30) Priority: 30.10.2001 US 21573

(71) Applicant: CARRERA CORPORATION Syracuse New York 13221 (US)

(72) Inventors: • Watting, Philippe 45071 St. Didier au Mont D'Or (FR) • Petit, Xavier Saltanville, New York 13027 (US)

(74) Representative: Leckey, David M. Frazer & Deane, 179 Queen Victoria Street London EC4V 4EL (GB)

(54) Self-contained refrigeration unit

(57) A removable self contained refrigeration unit 12 is mounted within a vehicle 10, and is removable from the vehicle as a unit. The casing 14 is mounted to the evaporator 42 and the condenser 34, and in one embodiment also mounts the compressor 46. With the embodiment that mounts the compressor 46, no refrigerant lines need be found elsewhere except on the casing 14. The casing 14 is removable from the vehicle as a one piece unit merely by connecting or disconnecting electrical connections 24, 26. In a second embodiment (Fig. 5) the compressor 34 is mounted remotely from the casing 14 but the evaporator 42 and condenser 34 are still changeable as a one piece unit 12. In this embodiment a refrigerant connection 50 need also be connected or disconnected to charge the unit.

52 | N. van Zeebroeck – Patent mining – 27/4/2010

Source: EPO Patent Teaching Kit (2010)



Patent mining

Outils et techniques

Outils et techniques

- Le défi informatique
 - 60 millions de documents de brevets dans le monde
 - Dont la taille augmente d'année en année
 - 500,000 nouveaux brevets aux USA, Japon, OEB par an
 - ➔ Comment identifier les brevets pertinents dans une optique de veille concurrentielle ou technologique?
 - PATENT MINING

Outils et techniques

- Patent mining:
 - Application de techniques de data mining aux banques de données de brevets
 - Repose essentiellement sur
 - Le text mining
 - L'analyse de liens (link analysis)
 - Une problématique particulière
 - Harmonisation des noms des déposants (et inventeurs)

Outils et techniques

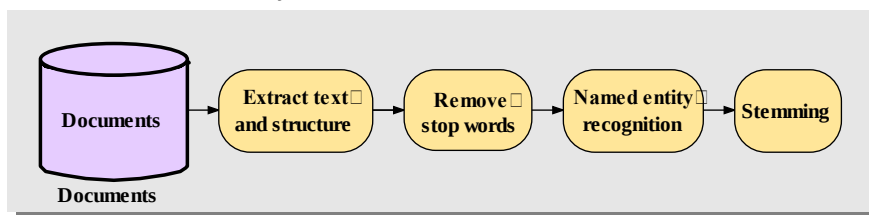
- Text mining:
 - The process of deriving high quality information from text (*Wikipedia*)
 - Usually involves
 - structuring the input text (pre-processing & representation)
 - deriving patterns within the structured data (analysis)
 - evaluation and interpretation of the output (evaluation)
 - Typical tasks:
 - Categorization, clustering, concept/entity extraction, production of taxonomies, sentiment analysis, document summarization, and entity relation modeling

Outils et techniques: Text mining

- 1. Pre-processing
 - Let D be a collection of documents
 - Standard pre-processing steps
 - Extract text and structure (eg. from Microsoft Word, HTML pages or LaTeX to XML)
 - Clean characters and encoding
 - Remove stop words (eg. remove "the", "at", "all", etc)
 - Named entity recognition (eg. find proper names)
 - Stemming (eg. extract "process" from "processing")
 - Part-of-Speech Tagging

Outils et techniques: Text mining

- 1. Pre-processing
 - This is a tedious job!



- But tools are readily available, eg.:
 - Galilei (ULB)
 - Weka (Wakaïke)
 - Text to Matrix Generator (Matlab toolbox)

Outils et techniques: Text mining

• 2. Représentation

- In its basic form, each document is represented by a vector
→ **Vector Space Model**
- The coordinates of the vector are words
 - Each element of the vector represents the frequency of the word in the document or the query
 - In the space of words
- Document-Term Matrix
 - $f(i,j)$ = frequency of term i in document j (or $TFIDF_{ij} = f_{ij} \times \log\left(\frac{N}{d_j}\right)$)

$$\mathbf{D} \triangleq \left[\begin{array}{cccc} & \text{documents} & & \\ f_{11} & f_{12} & \dots & f_{1n_d} \\ f_{21} & f_{22} & \dots & f_{2n_d} \\ \vdots & \vdots & \ddots & \vdots \\ f_{n_w 1} & f_{n_w 2} & \dots & f_{n_w n_d} \end{array} \right] \left. \vphantom{\begin{array}{c} f_{11} \\ f_{21} \\ \vdots \\ f_{n_w 1} \end{array}} \right\} \text{words}$$

59 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Saerens (2008)



Outils et techniques: Text mining

• 3. Information Retrieval

- We have a collection of patent documents
- You want to retrieve the documents related to a given concept
- You submit a query expressed through words or terms
- An information retrieval system returns the documents most related to this concept

60 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Saerens (2008)



Outils et techniques: Text mining

- 3. Information Retrieval

- A query is also represented by a vector
 - Here is a query q
 - Each element is 0 or 1 (presence or absence of a word)

$$\mathbf{q} \triangleq \begin{bmatrix} 0 \\ \vdots \\ 0 \\ 1 \\ 0 \\ \vdots \\ 0 \end{bmatrix} \quad i \longrightarrow \text{word } w_i \text{ is present in the query}$$

- The purpose is of course to retrieve documents d_i based on a query q
 - We have to define a notion of similarity between a query and a document

Outils et techniques: Text mining

- 3. Information Retrieval

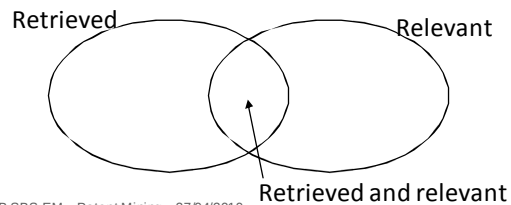
- The similarity between a query q and a document d_i can be defined as
 - The cosine of the angle between these two vectors:

$$\text{sim}(\mathbf{q}, \mathbf{d}_i) \triangleq \cos(\mathbf{q}, \mathbf{d}_i) = \frac{\mathbf{q}^T \mathbf{d}_i}{\|\mathbf{q}\| \|\mathbf{d}_i\|}$$

- Euclidean distance does not work well because queries contain much lesser words than documents
- It is called the cosine similarity

Outils et techniques: Text mining

- 4. Evaluation des résultats
 - The precision measure estimates the percentage of relevant retrieved documents in the set of all retrieved documents
 - Precision indicates to which extend the retrieved documents are indeed relevant
 - The recall measure estimates the percentage of relevant retrieved documents in the set of all relevant documents
 - Recall indicates to which extend the relevant documents are indeed retrieved
 - The F-measure, taking both precision and recall is
 - $F = 2 (precision \times recall) / (precision + recall)$



63 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Saerens (2008)



Outils et techniques: Link Analysis

- Link analysis:
 - A set of techniques
 - Applied to: Hyperlink document repositories
 - Typically web pages
 - Objective:
 - To exploit the link structure of the documents
 - In order to extract interesting information
 - Viewing the document repository as a graph where
 - Nodes are documents
 - Edges are directed links between documents
 - It does not exploit the content of the pages !!

64 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Saerens (2008)



Outils et techniques: Link Analysis

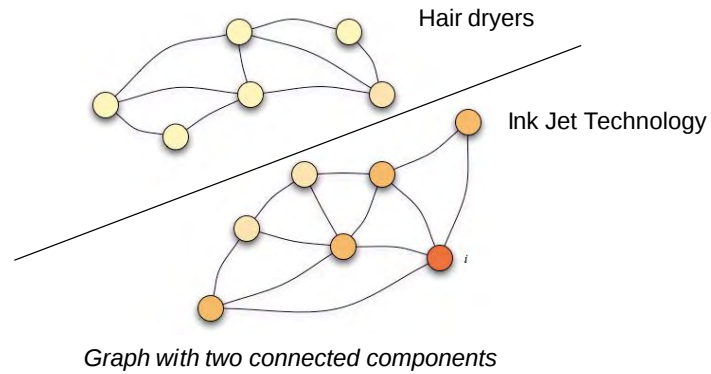
- Patent Link analysis
 - Brevets sont reliés par un réseau de citations
 - Brevet B cite brevet A
 - ➔ Invention B fait référence à l'invention A (L'améliore? L'utilise? L'enrichit?)
 - Intérêt des citations
 - Partant d'un brevet, permet de retracer
 - L'intérêt ou l'importance de la technologie (i.e. son impact sur le domaine ou le marché)
 - L'évolution de la technologie (i.e. nouveaux développements)
 - Les acteurs qui inventent et brevettent autour de la même technologie (i.e. la concurrence et son intérêt pour cette technologie)
 - La densité et la concentration de la protection par brevets autour d'une technologie (i.e. les patent 'thickets')

Outils et techniques: Link Analysis

- Link analysis: Que peut-on en faire?
 - Cutting a graph in small pieces and exploring it
 - Looking for connected components
 - Identifying central or prestigious nodes by link analysis
 - HITS (Authority v. Hub): interdependent measures
 - PageRank (Google): A recursive weighting
 - **Computing similarities between nodes**
 - Based on different kernels, which exploit the (probabilistic) distance between nodes
 - **Clustering nodes of a graph**
 - Based on similarity measures
 - Typically using k-means or other clustering techniques
 - Finding dense regions
 - Graph partitioning

Outils et techniques: Link Analysis

- Link analysis: quelques notions utiles
 - Connected component: a maximal connected subgraph



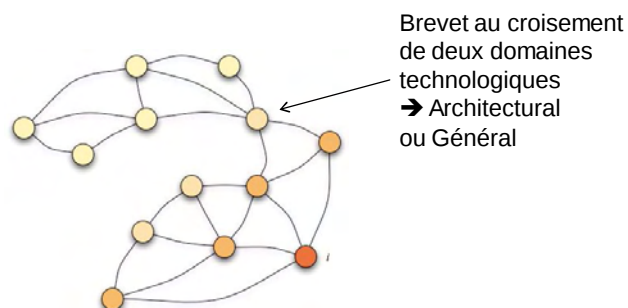
67 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Saerens (2008)



Outils et techniques: Link Analysis

- Link analysis: quelques notions utiles
 - Articulation point or vertex-cut: a node (vertex) of a graph such that removal of the node causes an increase in the number of connected components



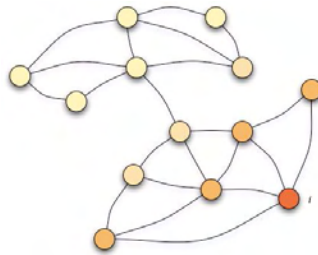
68 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Saerens (2008)



Outils et techniques: Link Analysis

- Link analysis: quelques notions utiles
 - Bridge or edge-cut: an arc (edge) of a graph such that removal of the arc causes an increase in the number of connected components



69 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

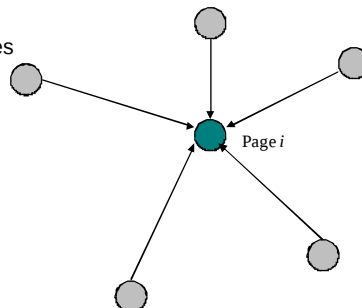
Source: Saerens (2008)



Outils et techniques: Link Analysis

- Link analysis: quelques notions utiles
 - PageRank: notion de prestige
 - A page with a high score is a page that is pointed by
 - Many pages
 - Having each a high score
 - Thus a page is an important page if
 - It is pointed by many, important, pages

Permet d'identifier les brevets importants



70 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Saerens (2008)



Outils et techniques: Link Analysis

- Link analysis: quelques outils
 - JUNG: Java Universal Network/Graph Framework
 - Open source and written in Java
 - Mainly a toolbox of methods
 - <http://jung.sourceforge.net>
 - UCINET
 - Social Network Analysis Software
 - Written by active researchers in the social network community
 - Quite complete commercial software
 - <http://www.analytictech.com>
 - INSNA
 - Different tools for social networks analysis
 - http://www.insna.org/software/software_old.html

Outils et techniques: Name harmonization

- Harmonisation des noms des déposants
 - Exemple:
 - IBM: Plus de 200 orthographes différentes dans les DB brevets
 - Comment regrouper tous les brevets de chaque société?
 - Et tenir compte des dépôts par les filiales v. maison-mère?
 - Et tenir compte des fusions et acquisitions au cours du temps?
 - Ex: les brevets de Digital reviennent à Compaq puis à HP

Outils et techniques: Name harmonization

- Projets parallèles dans le monde académique
 - USA:
 - NBER dataset (www.nber.org)
 - Europe
 - KUL-EUROSTAT
 - Bocconi-OECD (www.epip.eu)
 - Objectif ultime: lier les déposants de brevets à une DB commerciale
 - USA: Compustat / Dun & Bradstreet
 - Europe: Amadeus (BVD)

Outils et techniques: Name harmonization

- Méthodologie générale
 - Character cleaning
 - Punctuation cleaning
 - Legal form indication treatment
 - Common company words removal
 - Spelling variation harmonization
 - Approximate string matching
 - Condensing

Outils et techniques: Name harmonization

- Approximate string matching
 - Edit distance: Nb of operations to switch from one word to the other
 - Jaccard similarity measure: token-based and accounts for differences due to the position of the same tokens between otherwise identical strings

$$J = \frac{T_1 \cap T_2}{T_1 \cup T_2} \rightarrow 2 \frac{T_1 \cap T_2}{T_1 + T_2}$$

- Can be weighted by the inverse frequency of a token among company names
 - « International », « Holding »: very small weight
 - « Agripa », « Solvay »: maximum weight

75 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Thoma (2008)



Outils et techniques: Name harmonization

- Résultats sur Patstat
 - 7,5 millions de noms de déposants différents à l'origine
 - Après standardisation: 5 millions de noms (33% de réduction)
 - Noms standardisés reliés aux codes standardisés EPO/USPTO

Applicants by Last Patent Document Published						
Period	Original Names		Harmonized Names		Harmonized Names with std codes	
	N	%	N	%	N	%
before 1970	1,149,408	15.27	861,256	17.06	6,384	0.74
1971-1980	909,710	12.09	601,298	11.91	64,247	7.42
1981-1990	1,354,241	17.99	835,629	16.55	164,714	19.04
1991-2000	1,692,716	22.49	1,098,137	21.75	262,780	30.37
after 2000	2,419,645	32.15	1,651,628	32.72	367,165	42.43
Overall	7,525,720	100.00	5,047,948	100.00	865,290	100.00

76 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Thoma (2008)



Outils et techniques: Name harmonization

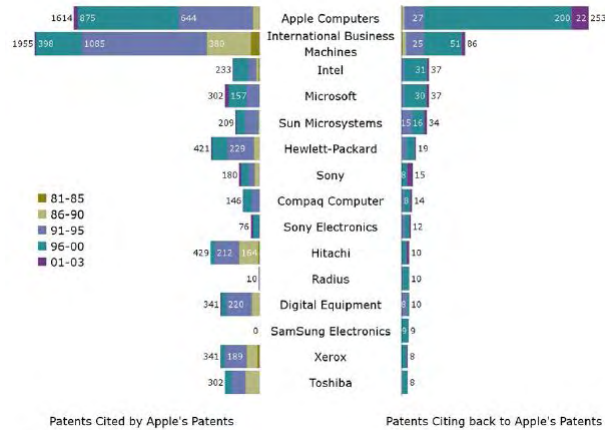
- Résultats sur Patstat
 - Matching avec Amadeus ou Compustat
 - Vise uniquement les déposants industriels (86%)
 - 244,632 noms originaux regroupés en 173,906 noms standardisés
 - 89,061 noms originaux (36%) → 68,126 noms standardisés
 - Associés à un code Amadeus (BVDID)
 - Couvrant 1,8 millions de publications de brevets
 - » 60% des brevets OEB
 - » 94% des brevets déposés par des sociétés européennes
 - 121,697 noms originaux (50%) → 75,611 noms standardisés
 - Associés à un code Amadeus (BVDID), Compustat (GVKEY) ou D&B
 - Couvrant 2,6 millions de publications de brevets
 - Disponible sur <http://www.researchoninnovation.org/epodata/>

Patent mining

Que peut-on retirer de ces techniques?

Résultats

- Analyse concurrentielle temporelle
 - Ex: Apple



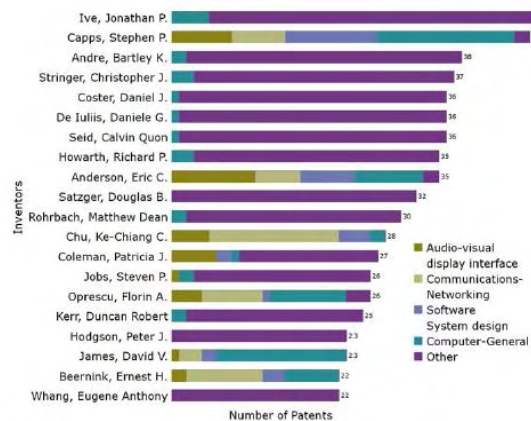
79 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Computer Patent Annuities (2004)



Résultats

- Analyse concurrentielle temporelle
 - Ex: Apple



80 | N. van Zeebroeck – ULB SBS-EM – Patent Mining – 27/04/2010

Source: Computer Patent Annuities (2004)



Patent mining

Conclusions

Conclusions

- Protéger l'innovation est un impératif
- Ignorer celle des autres serait coupable
 - Cf. Research in Motion (Blackberry) v. NTP
- Les brevets constituent une source unique pour renseigner
 - Sur la concurrence
 - Sur les technologies existantes ou émergentes
 - Sur les brevets qui pourraient réduire la liberté d'entreprendre
- Mais le volume de ces données requiert
 - Une certaine connaissance du jargon des brevets
 - De bons outils pour extraire l'information pertinente
- Patent intelligence: un mélange
 - De veille stratégique
 - Et de data mining