

3DEXPERIENCE

Merging Information from Structured and Unstructured Information Sources in Search Based Applications

Gregory Grefenstette

Skyrocketing Volumes

2015

7.9 zettabytes

1 ZB = 1 *trillion* GBs



1 petabyte/
15 sec.

+40%
year

Old World View

Structured Data

- Databases
- Transaction Logs
- Spreadsheets
- LDAP Directories
- ERP Exports
- Application Data



Unstructured Data

- Web Pages
- Email
- Office Documents
- RSS Feeds
- PDFs
- Blogs & Forums



Two types of information, two ways to find information



DATABASES

Structured Data
Transaction
All tuples

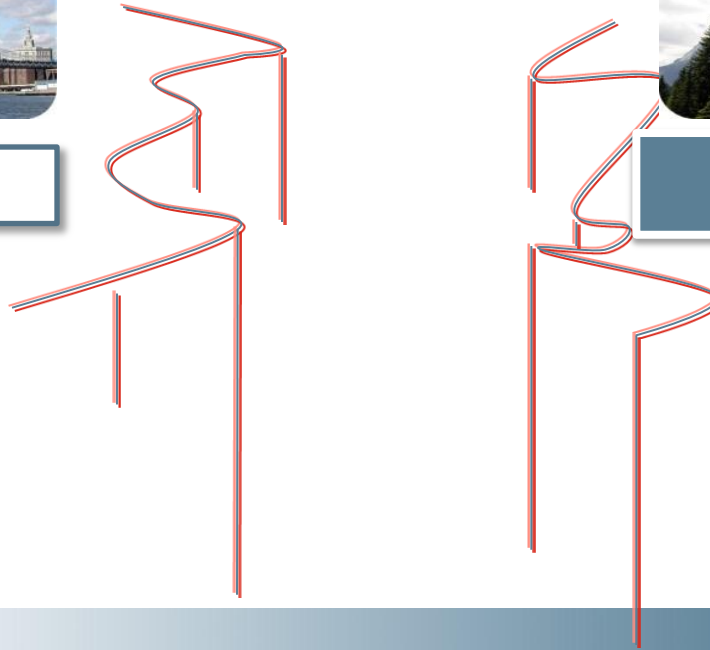
Safe,
Precise, SQL
Slow



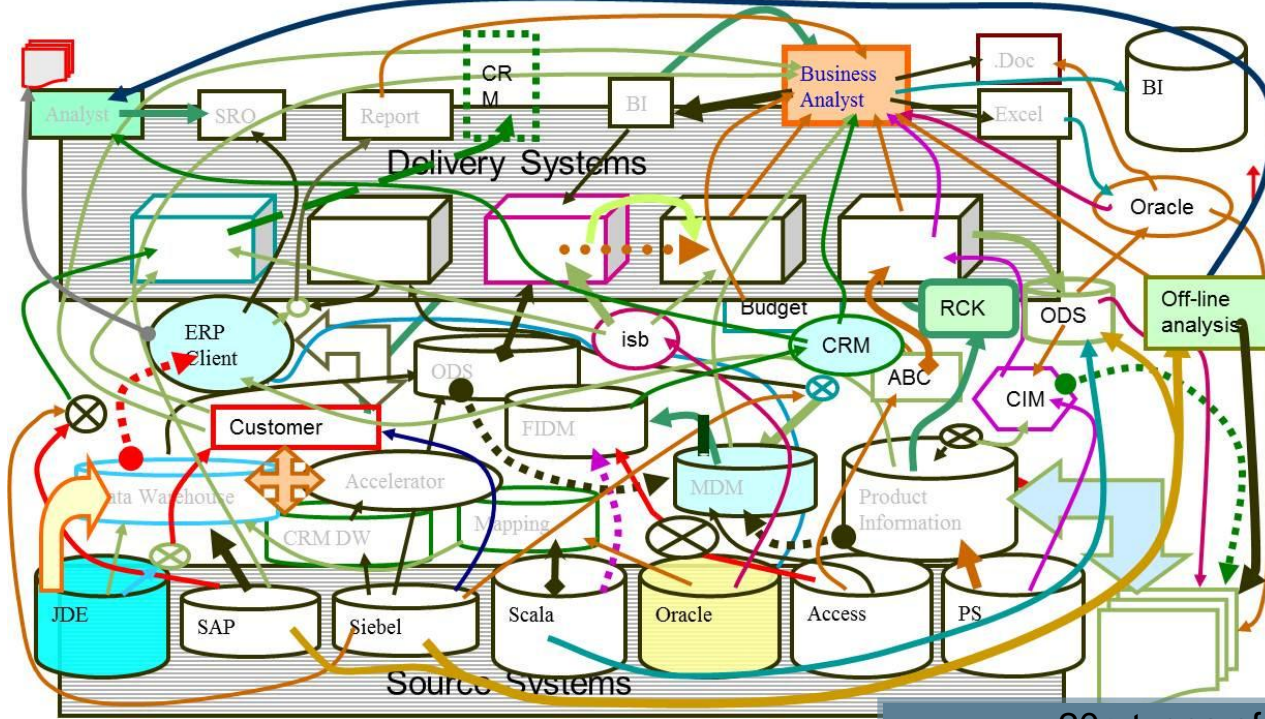
SEARCH ENGINES

Text
Similarity
Ranking

Intuitive
Fast
Partial



Organisational Data *all over the place*



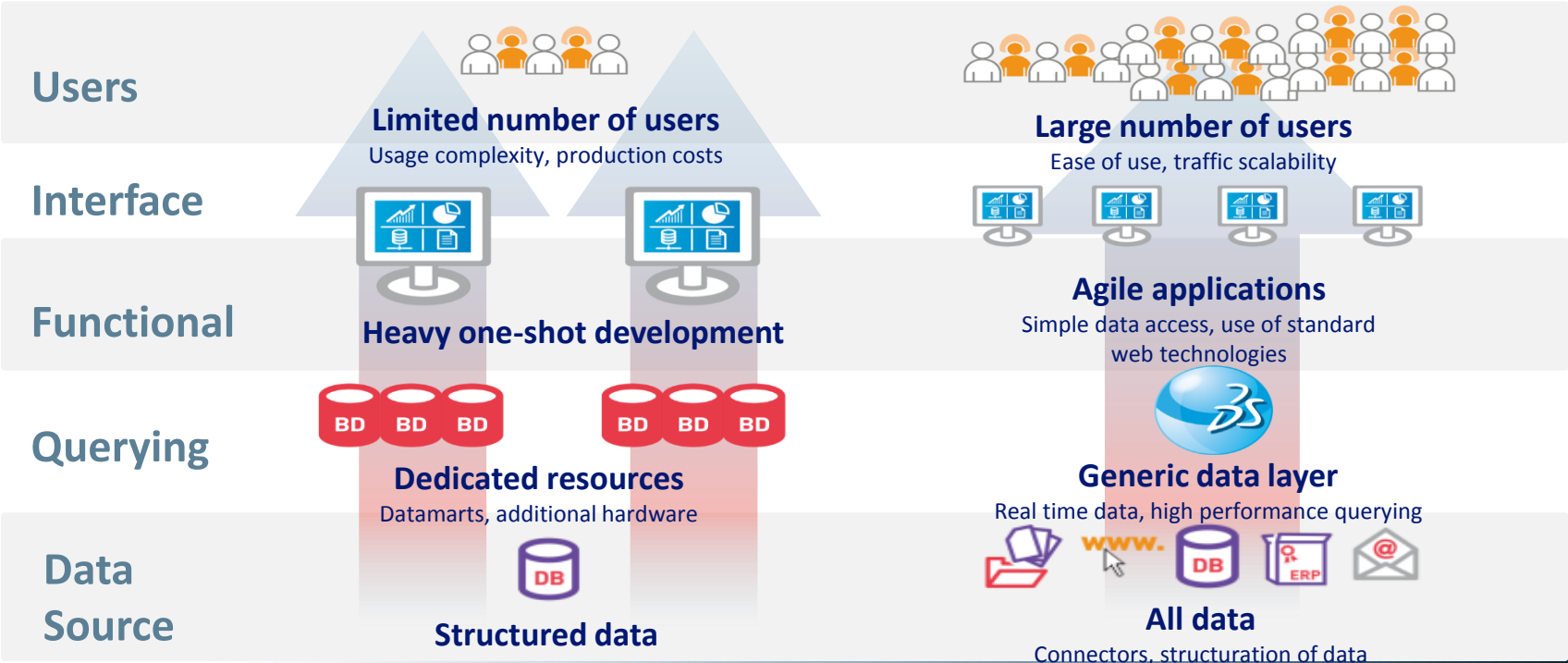
20+ types of systems
6% with 50+ ERP systems alone

Source: Leveraging Search to Improve Contact Center Performance
Richard Snow, VP & Research Director, Customer & Contact Center Management
March 2009

Search Based Applications Goals

traditional

SBA



3DS.COMEXALEAD@Dassault-Systemes | Confidential Information | 4/17/2012 | ref.: 3DS_Document_2012

Advantages of Search Engine Technology

Usability

360°, Google-like, interactif,
conversational



Agility

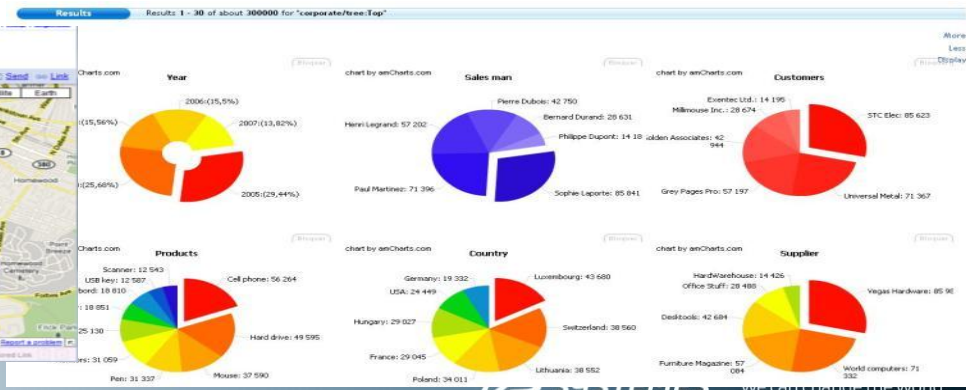
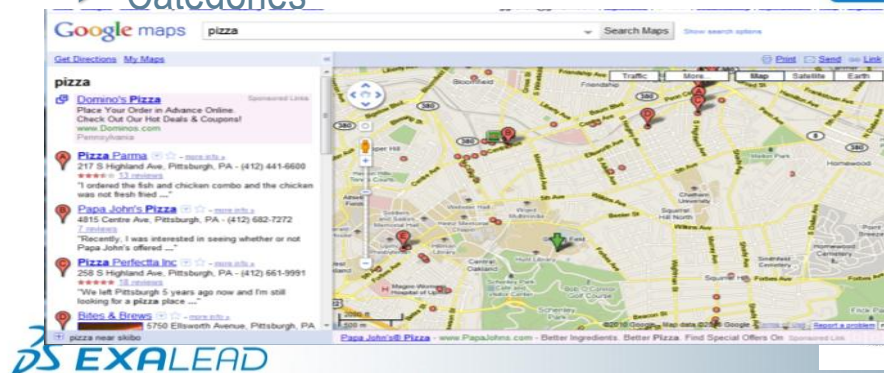
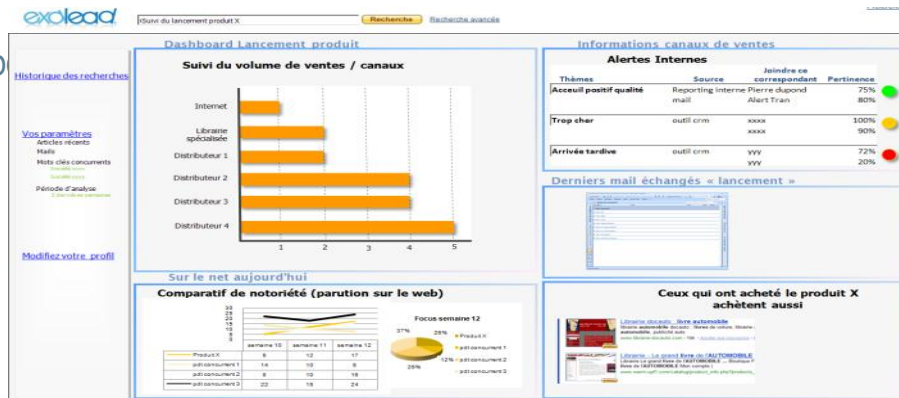
Flexible, Agile,
Days vs Months

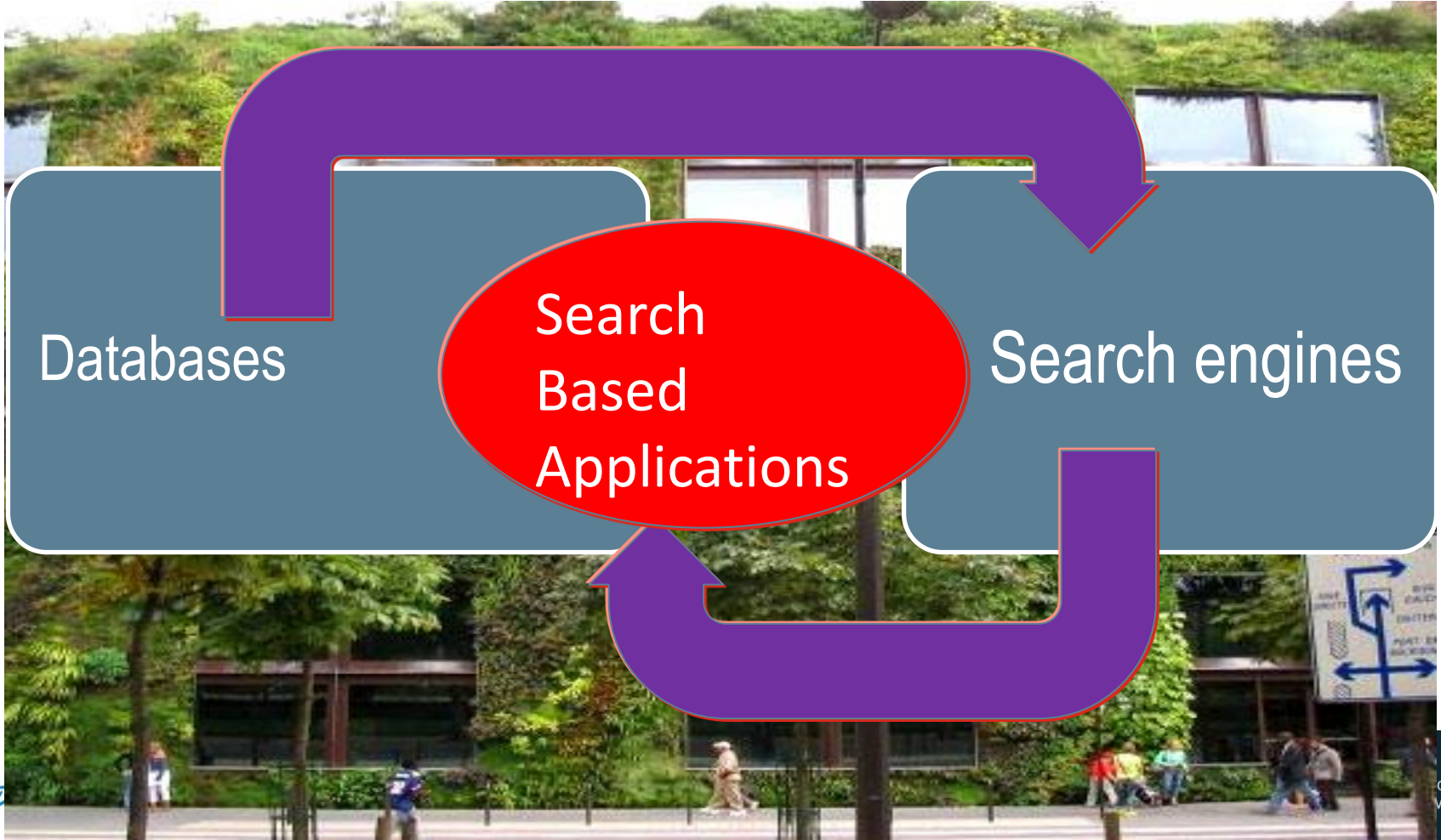
Performance

Real time, millions of end-users,
Terabytes of information

Search Engines now handle rich semantics

- ▶ Text fields
 - ▷ « ... the certification test is documented in the rep
- ▶ Numerical fields
 - ▷ 3.14159265
- ▶ Date
 - ▷ 16/11/1957
- ▶ GPS coordinates, real world coordinates
 - ▷ 48.451065619, 1.4392089
- ▶ Categories





How Search Based Applications Work



Connect

- Get real-time flows of data
- Get and maintain security information

Process

- Manage file formats (PDF, office, drawings, XML...)
- Ability to understand free text to relate text to structured objects

Access

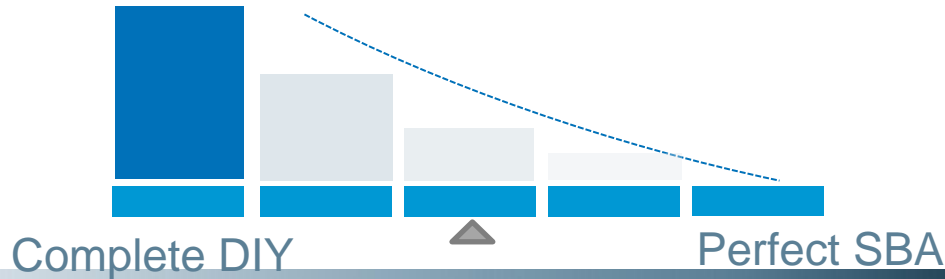
- A highly scalable data repository
- full text search, navigation and reporting capabilities (the Index)

Interact

- A Framework to create search oriented web applications at the speed of light
- Create virtual feeds of information (RSS, etc...) and associate widgets

Packaged as one, easy to deploy software

Built-in cluster architecture, for high-availability and scalability



When to SBA and not to SBA

- ▶ Beware that a SBA is not
 - ▷ A replacement for transactional applications
 - ▶ A SBA won't manage your workflows, lifecycles, and won't modify the existing systems
 - ▷ A good excuse to drop your business intelligence software
 - ▶ A SBA goal is not produce the pixel perfect highly complex final report you have to submit to the SEC
 - ▷ Replace all your complex, historical business systems
 - ▶ A SBA goal is not to reproduce all the business logic of existing applications. It's to simplify it for information access
- ▶ A SBA addresses critical business issues by enabling easy Search & Discovery into key data by key users

Four Types of Search

Four Types of Search

MOA GEFCONET [Automotive.] > Recherche T & T

LOGISTICS FOR MANUFACTURERS
Paul VAJSMAN ?

Recherche T & T | Encours | Recap. Stocks | Stock par agence | Bon de transport | Historique des commandes | Historique des rejets

Recherche T & T

VIN
VIS (XXXXXXXX)

Code constructeur (XXX)

VDS (XXXXXX)

Immatriculation

Num CIALOG

Nombre de résultats par page : 10

Réinitialiser | Rechercher

Traditional search on database is complicated:

- Several fields to fill in
- Need to know field values

Four Types of Search

Unique Search Box



Four Types of Search

Faceted Search

3SUISSES.fr
1^{ER} SITE MARCHAND MODE & DÉCO en savoir +

Aide | Newsletter | Commande Directe à partir de vos catalogues | Suivi de commande | Mon compte | PANIER (0 article)

Accueil Femme Homme Enfant Maison Hightech Loisirs Promos

Rechercher : Mots clés ou référence catalogue (ex : 1234567)

300 articles trouvés pour votre recherche : T SHIRT

AFFINER VOTRE RECHERCHE

Page 1/17

Trier les articles par

Par prix
▶ De 10 à 20 (287)
▶ De 20 à 30 (149)
▶ De 0 à 10 (144)
▶ De 30 à 40 (62)
▶ De 40 à 50 (20)
Plus de prix

Par coloris
▶ noir (247)
▶ blanc (148)
Plus de coloris

Par taille
▶ 36 (258)
▶ 42 (254)
Plus de tailles

Par marque
▶ Puma (36)
▶ Actua mode (35)
▶ Adidas performance (33)
▶ Votre Mode (31)
▶ 3 Suisses Collection
▶ Femme (30)
Plus de marques

Par univers
▶ Femme (241)
▶ Enfant (148)
▶ Homme (128)
▶ Sport (98)
▶ Lingerie Beauté (22)
Plus d'univers

Par boutique
▶ Bonnes affaires (158)
▶ Shopping par produit (147)
▶ Bonnes Affaires (85)
▶ Marques (32)
▶ Les nouveautés du sport (30)
Plus de boutiques

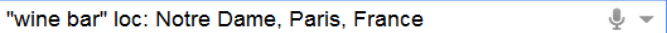
Par rayon
▶ Bonnes affaires (158)
▶ Shopping par produit (147)
Plus de rayons

Product Listings:

- T-shirt TOGETHER depuis 64.90 €
- T-shirt LEVTS® depuis 60.00 €
- T-shirt manches longues LEVTS® depuis 60.00 €
- T-shirt manches longues PEPE JEANS depuis 49.90 €
- T-shirt TOGETHER depuis 49.90 €
- T-shirt homme LEVTS® depuis 45.00 €

Fenêtres pop-up bloquées : 1

Four Types of Search



+You Web Images Videos **Maps** News Gmail More ▾

grefgr2@gmail.com ▾

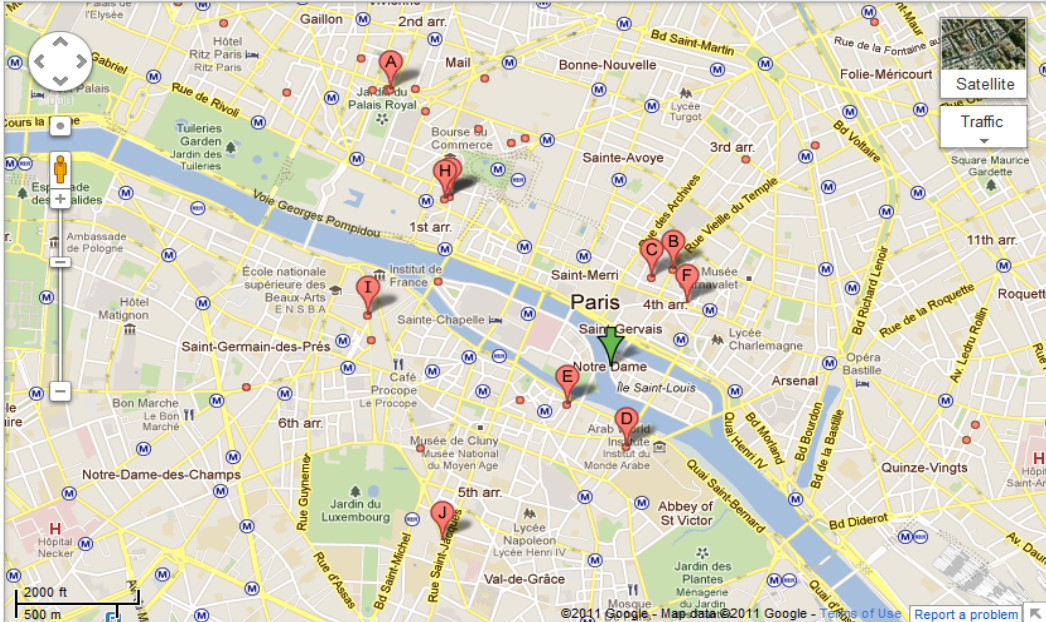
Google

"wine bar" loc: Notre Dame, Paris, France

Get directions My places

"wine bar" near Notre Dame, Paris, France

- A Willis Wine Bar** ▾
13 Rue des Petits Champs, 75001 Paris, France 1.8 km NW
+33 1 42 61 05 09 · williswinebar.com
★★★★☆ 12 reviews €€
"Excellent wine by the bottle selection with a reasonable by the glass ..." -
- B La Belle Hortense** ▾
31 Rue Vieille du Temple, 75004 Paris, France 607 m NE
+33 1 48 04 71 60 · cafeine.com
3 reviews €€
"It's a small bookstore in the Marais with an equally small wine bar. A glass of Sancerre - €5. There is a back room with banquette seating as well as a ..." - google.com
- C Le Coude Fou** ▾
12 Rue Bourg Tibourg, 75004 Paris, France 517 m NE
+33 1 42 77 15 16
★★★★☆ 36 reviews €€
"Historic wine bar atmosphere, lovely food. The



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Four Types of Search

- ▶ In the past ten years, people have learned to use the unique search box

| | Google | Bing | Ask | Yahoo |
|-------------|-------------|-------------|-------------|-------------|
| 1 | 26.79% | 46.76% | 49.90% | 54.15% |
| 2 | 23.39% | 18.81% | 13.03% | 18.11% |
| 3 | 18.72% | 15.92% | 16.09% | 12.31% |
| 4 | 12.78% | 8.40% | 6.72% | 7.08% |
| 5 | 8.23% | 5.23% | 6.42% | 3.73% |
| 6 | 4.55% | 1.94% | 3.77% | 2.47% |
| 7 | 2.76% | 1.40% | 0.71% | 0.97% |
| 8 | 1.36% | 0.71% | 2.24% | 0.68% |
| 9 | 1.02% | 0.77% | 0.81% | 0.33% |
| 10 | 0.41% | 0.06% | 0.31% | 0.18% |
| avg. length | 2.93 | 2.27 | 2.39 | 2.06 |

<http://blog.alessiosignorini.com/2010/02/average-query-length-february-2010/>

- ▶ People have learned to use facets on shopping sites
- ▶ People are *learning* to do map search
- ▶ Forms are still boring

Faceted Search and Semantics

- ▶ Facets are semantic dimensions
- ▶ They are visualisations of semantics that users can understand
- ▶ Semantics can come from databases
- ▶ Semantics can come from text
- ▶ Common semantic dimensions link together structured and unstructured data
- ▶ Search Based Applications are possible because of semantics

3 SUISSES.fr
1er SITE MARCHAND MODE & DECO
Accueil Femme Homme Enfant Maison Hi-tech
AFFINER VOTRE RECHERCHE
300 articles

Par prix
▶ De 10 à 20 (287)
▶ De 20 à 30 (149)
▶ De 0 à 10 (144)
▶ De 30 à 40 (62)
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▶ Votre Mode (31)
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▶ Marques (32)
▶ Les nouveautés du sport (30)
Plus de boutiques

Par rayon
▶ Bonnes affaires (156)
▶ Shopping par produit (147)
Plus de rayons

Semantics

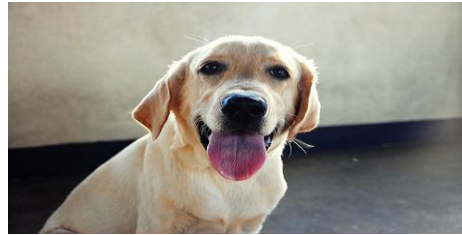
Type



[Anõge](#), Flickr



Equality



Is same as



Relation



HOLDS



Semantics in Databases

- ▶ Databases are “structured”
- ▶ Database semantics comes from row:column
 - ▷ Column defines **Type** of entity
 - ▶ Examples: client, supplier
 - ▷ Row defines **Relation** between entities
 - ▶ *Primary key* - main entity
 - ▷ As for **Equality**
 - ▶ This is the whole problem of Master Data Management

| | | | |
|---------|----------|----------|----------|
| Graff | rgraff | 392-3900 | Pharmacy |
| Harris | bharris | 392-5555 | Medicine |
| Ipswich | zipswich | 846-5656 | PHHP |

| Immediate Federated View | | | |
|--------------------------|---------|------------|---------|
| Erik McClain | | Address 1 | Billing |
| McClain Erik | | Email | CRM |
| Erik | McClain | Birth Date | Support |
| Erik | McClain | Phone | ERP |

Semantics in Text

- ▶ Text is “unstructured”
 - ▷ Semantics not explicit
 - ▶ Resources and processing needed
- ▶ Natural Language Processing
 - **Typing**
 - entities/things: Rules, lists, ontologies
 - **Equality**
 - Linguistic variants, morphology, stemming, synonyms
 - **Relations**
 - Parsing, co-occurrence (related terms), Linked Open Data

| | |
|--|--|
| | |
| | Google has acquired social search service Aardvark, says a source that has been briefed on the deal, for around \$50 million. We first reported on the discussions between the two companies ... |



Semantics in databases and text

▶ Database

- ▷ **Type**==column
- ▷ **Relation**==row
- ▷ **Equality**==???



▶ Text

- ▷ **Type**==ontologies
- ▷ **Relation**==parsing
- ▷ **Equality**==morphology, synonyms



- Search Based Applications
 - Structure from databases
 - Linguistic variation from text
 - **Types**==facets
 - **Relation**==fields
 - **Equality**==text processing

Semantics in Search Engines

Database semantics is imported into search engine facets

1

| AXES LIST | rename | delete |
|------------|--------|--------|
| Attributes | | |
| Commercial | | |
| Licence | | |
| Prestation | | |
| Reglement | | |
| Societe | | |
| Source | | |

Field: Raison_Sociale

| | |
|---------------------------|-------------------------------------|
| PRIMARY KEY | <input type="checkbox"/> |
| USE AS TIMESTAMP | <input type="checkbox"/> |
| REF. | \$ (3) |
| ACCUMULATE | <input type="checkbox"/> |
| TITLE | <input type="checkbox"/> |
| URL | <input type="checkbox"/> |
| THUMBNAIL URL | <input type="checkbox"/> |
| INDEX CONTENT | <input checked="" type="checkbox"/> |
| TEXT SCORE | Normal text |
| HTML CONTENT | <input type="checkbox"/> |
| DISABLE WORD FILTERS | <input type="checkbox"/> |
| DISPLAY | <input checked="" type="checkbox"/> |
| DISPLAY NAME | Raison_Sociale |
| DISPLAY LENGTH IN RESULTS | 0 |
| ADD TO SUMMARY | <input checked="" type="checkbox"/> |
| DATE | <input type="checkbox"/> |
| SIZE | <input type="checkbox"/> |
| LANGUAGE | <input type="checkbox"/> |
| SECURITY TOKEN | <input type="checkbox"/> |
| DISPLAY IN PREVIEW | <input type="checkbox"/> |
| CATEGORIZATION ROOT | Societe |
| FIELD | <input type="checkbox"/> |
| FIELD NAME | raison_sociale |
| ENUM FIELD | <input type="checkbox"/> |
| FILE | <input type="checkbox"/> |
| FILE ROOT | <input type="checkbox"/> |

2

3

Refine your search

Date

- 2008 (58) [exclude](#)
- [June 2008](#) [exclude](#)
- [July 2008](#) [exclude](#)

Societe

- [Cab Gerini](#) (11) [exclude](#)
- [Auchon](#) (11) [exclude](#)
- [Nara Fr](#) (6) [exclude](#)
- [Mind4all Gmbh](#) (5) [exclude](#)
- [Aras Creation](#) (5) [exclude](#)
- [KnowledgeCI](#) (3) [exclude](#)
- [Sacrosoft US](#) (3) [exclude](#)
- [Nara Spain](#) (3) [exclude](#)
- [CNP Paris](#) (2) [exclude](#)
- [FRA Systems](#) (2) [exclude](#)

Reglement

- [Oui](#) (48) [exclude](#)
- [Non](#) (10) [exclude](#)

Commercial

- [Francois Martin](#) (16) [exclude](#)
- [Jean-Pierre Durand](#) (12) [exclude](#)
- [Helene France](#) (11) [exclude](#)
- [Christine Fontaine](#) (10) [exclude](#)
- [Jean-Luc Dupont](#) (9) [exclude](#)

Licence

- [Deluxe](#) (7) [exclude](#)
- [Standard](#) (6) [exclude](#)
- [Basic](#) (5) [exclude](#)

Prestation

- [Developpement](#) (13) [exclude](#)
- [Formation](#) (12) [exclude](#)
- [Deploiement](#) (9) [exclude](#)
- [Configuration](#) (7) [exclude](#)

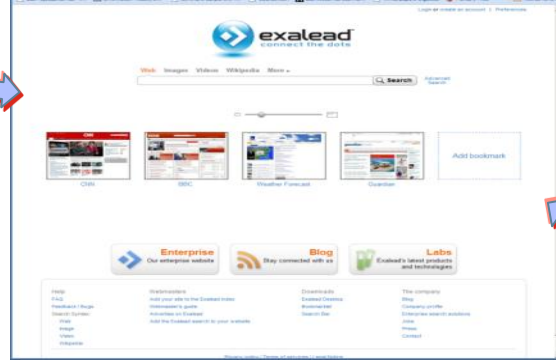
Search within results

[Go](#) [Less choices](#)

Semantics is extracted from unstructured text by NLP

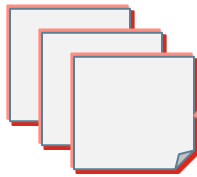


autosuggestion
language identification
related terms
related queries
spell checker
faceted search
local search

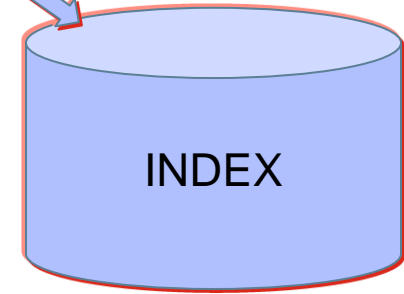


lemmatisation
synonyms
cross language
phonetic
Ontology Matcher

Data Sources

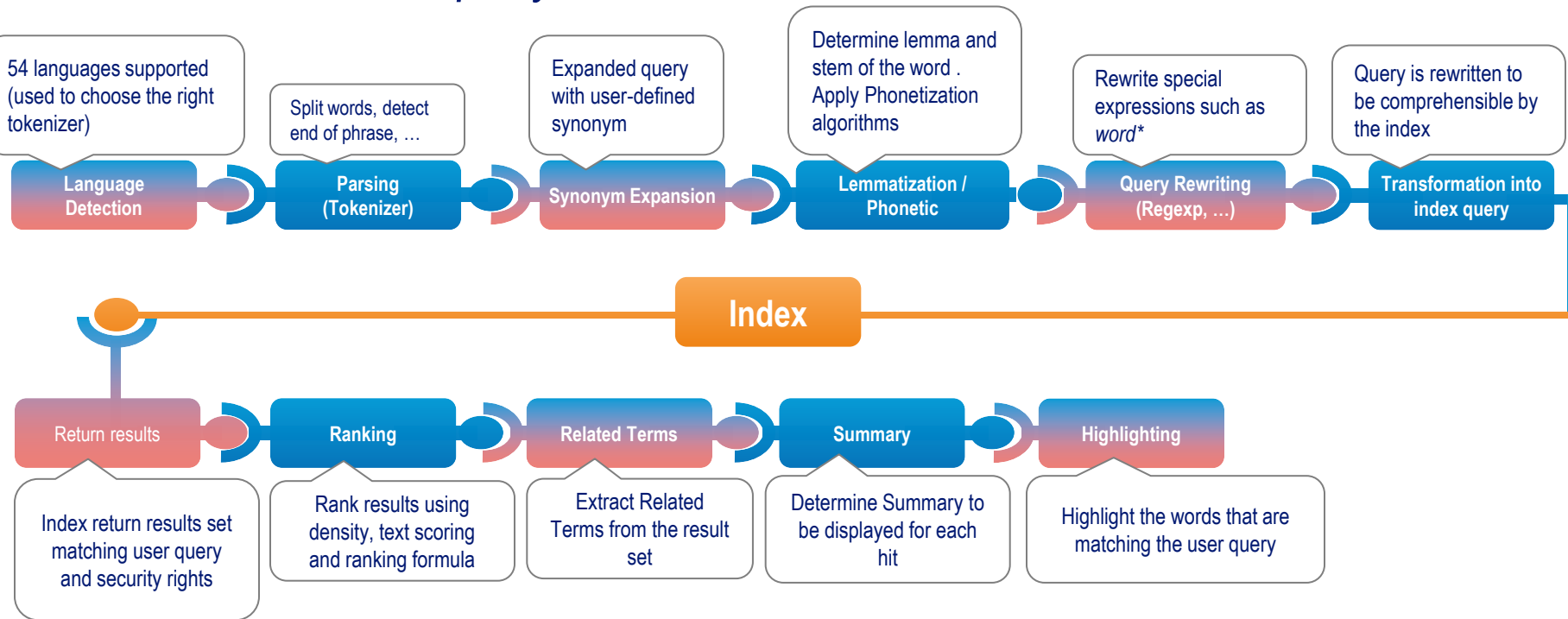


phonetic lemmatisation
stopwords
sentiment analysis
named entity
Categorizer
QueryMatcher
Clusterer
FastRules
HTMLRelevantContextExtractor



Text Processing Pipelines available in Search Engines

Understand the user query & enhance results



Search Side



API, Library & Ui Designer



Dashboards Faceted Search Mobile Apps Info Mash-ups Embedded



Info Mgmt Index

Documents Entities Sentences, Paragraphs Quantitative Metrics Images, Video RDF Triples



Semantic Factory

Entity & Sentiment Extraction Entity Matching & Joining Semantic Data Normalization Categorization & Faceting Quantitative Analytics Other kinds Of processing



Connector Library & API



Web Pages Social Content Docs in e-mail RDB/PLM Records Managed Content

Hosting

On-Premise

Exalead Data center

Public Cloud

Private Cloud

Search Based Application Platform

SBA Case Studies

Grenoble University Hospital

Critical Need

- 5M patient files, 2M clinical pathology reports, 500K medical prescriptions, 600k medical forms – all separate silos of information
- Easy information access for non-technical users – like they experience at home – expected simplicity
- Evolving collaborative dialog amongst medical practitioners – no longer just 1:1 patient to doctor

Exalead Solution

- Web-search style queries
- Single access portal for all information
- 2,000 user target
- Sub-second information retrieval time
- Pilot delivered 3 weeks by 2-person team

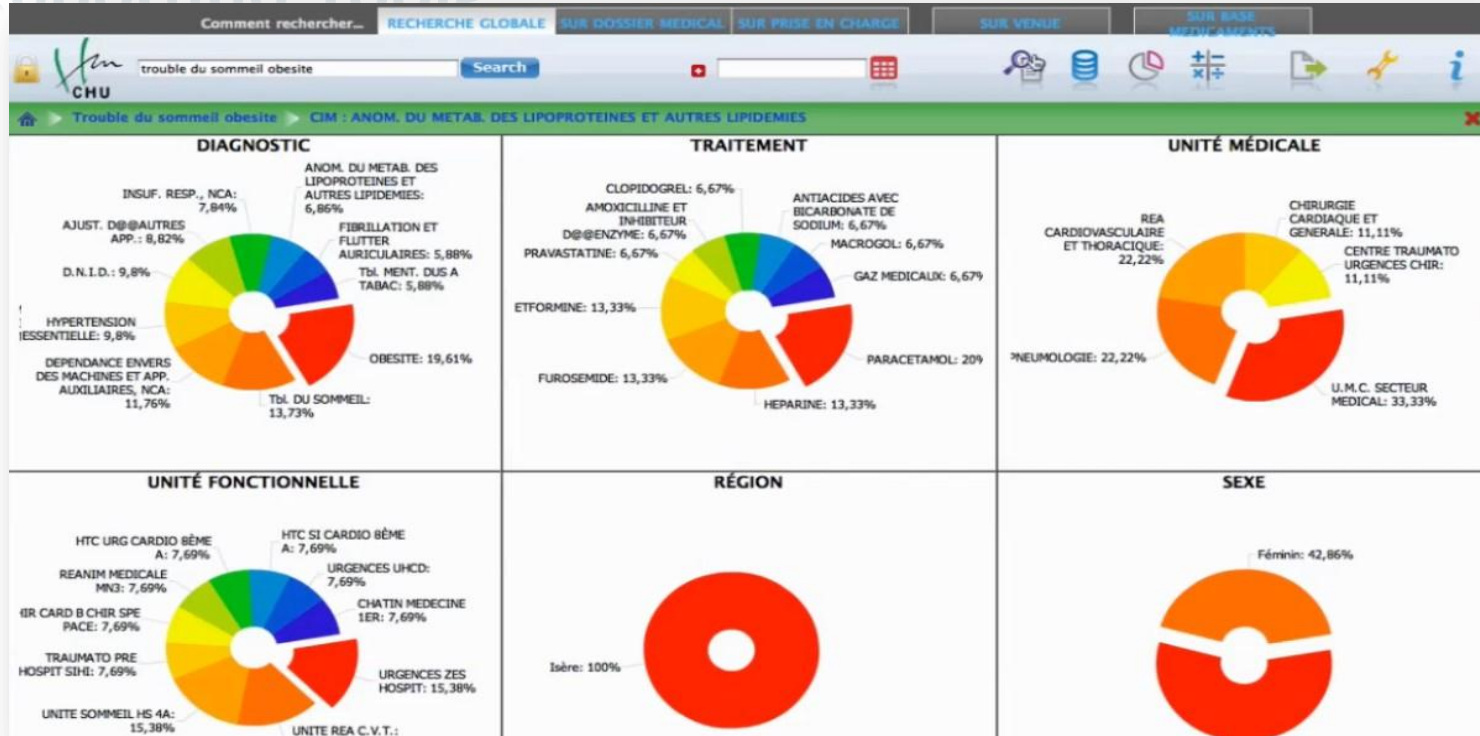
Single Portal for all Data

The screenshot shows a medical data portal interface. At the top, there is a search bar with the text "trouble du sommeil obesite" and a "Search" button. Below the search bar, there are several navigation tabs: "RECHERCHE GLOBALE", "SUR DOSSIER MEDICAL", "SUR PRISE EN CHARGE", "SUR VENUE", and "SUR BASE MEDIC 883070". The main content area is divided into three columns. The left column contains a "TAG CLOUD" with various medical terms like "CHIR AMBU MAINS BRULEES", "AMBULATOIRE", "DEPT CHIR", "MURE", "ISERE", "NES MATERNITE", "RECUEIL PMS", "SECTEUR MEDICAL", "ST MARTIN D", "HERES", and "URGENCES ZES HOSPIT". The middle column displays a list of patient records, including names, birth dates, and dates of medical visits. The right column shows a "DIAGNOSTIC" section with a list of medical conditions and their percentages, such as "HYPERTENSION ESSENTIELLE (18.69%)", "SOINS MED., NCA (14.33%)", "ANOM. DU METAB. DES LIPOPROTEINES ET AUTRES LIPEMIES (10.0%)", "CARDIOPATHIE ISCHEM. CHRON. (9.43%)", "EX. Spc. ET INVESTIG. NCA DE SUJETS AVEC AUCUN DIAG. FAIT (9.07%)", "AMOL (24.76%)", "E (12.96%)", "ENOXAPARINE (11.76%)", "HYDROXYZINE (10.52%)", and "ELECTROLYTES AVEC HYDRATES DE CARBONE (10.08%)". Below the diagnostic section is an "INTERVENTION" section with items like "IVG - IVG chirurgicale (47.64%)", "Cataracte par phacoémulsification (topique assistée) (17.82%)".

Callouts with arrows pointing to specific features:

- natural language queries (points to the search bar)
- display choice (navigation, list or analytics...) (points to the navigation tabs)
- parametric search: date or periods (points to the date selection icons in the patient list)
- self-generated tag cloud (points to the TAG CLOUD)
- faceted navigation (diagnostics, meds, medical service...) (points to the diagnostic and intervention sections)

Reporting Tools



Internet Antibody Catalog

Critical Need

- Many supplier catalogs (antibody, protein, ...)
- Web databases (PubMed, ScienceDirect, SCIRUS, Espace net...)
- Synonyms
- Time to find the right product = 1 day

Exalead Solution

- One information access point to all suppliers
- Easy to use interface
- Find the right products at the right price
- Synonyms, spelling mistake acceptance, ...
- Time to find the right product < 1 hour

Internet Antibody Catalog

Antibody Retrieval Solution Assistant
Powered by 



Did you mean: [interleukin 4](#)

No document matched your
interleucin 4

Antibody Retrieval Solution Assistant
Powered by 

Search Results

Results 1-10 of about 3,481

Synonyms selection

- H2-T3, H-2T3, TL antigen
- H2-T18, RT1-T18, RanoTL, TL antigen, Tla
- Rp113a, 1810026N22Rik, MGC107571, Tstap198-7, tum-antigen
- PCNA1, F22G5.29, F22G5_29, PROLIFERATING CELLULAR NUCLEAR ANTIGEN

| Host Specy | Species | Type | Size | Code | Epitope | Price | Supplier |
|--|---------|------|--------|--------------------------|---------|-------|--------------------------|
| Polyclonal Goat Anti Hepatitis B Surface Antigen A | | | | | | | |
| goat | | pab | | Z5010099 | | | Biochain |
| Plasmodium falciparum S-Antigen (112-124) | | | | | | | |
| rabbit | | | 1 ml | BP1090 | | 250 | Acris |
| CD30 (Ki-1 antigen) | | | | | | | |
| mouse | human | | 1 ml | DM032 | | 360 | Acris |
| Epstein-Barr Virus (EBV) Early Antigen | | | | | | | |
| mouse | | | 0.5 ml | DM3164 | | 170 | Acris |

Internet Antibody Catalog

Refine your search

Supplier

- [USBio](#) (53%) [exclude](#)
- [Acris](#) (18%) [exclude](#)
- [AbdSerotec](#) (5%) [exclude](#)
- [eBioscience](#) (5%) [exclude](#)
- [AdvancedImmunochemicals](#) (2%) [exclude](#)
- [SantaCruzBiotechnologies](#) (1%) [exclude](#)
- [Covance](#) (1%) [exclude](#)
- [Monosan](#) (1%) [exclude](#)
- [Novus](#) (1%) [exclude](#)
- [Genwaybio](#) (1%) [exclude](#)
- [Novocastra](#) (1%) [exclude](#)
- [DiagnosticBiosystems](#) (0.9%) [exclude](#)
- [Hytest](#) (0.9%) [exclude](#)
- [Fitzgerald](#) (0.9%) [exclude](#)
- [HyTest](#) (0.9%) [exclude](#)
- [Imgenex](#) (0.5%) [exclude](#)
- [Kamiya](#) (0.5%) [exclude](#)
- [BdBiosciences](#) (0.5%) [exclude](#)
- [Zymed](#) (0.4%) [exclude](#)
- [Calbiochem](#) (0.3%) [exclude](#)

Antibody Type

- [mab](#) (87%) [exclude](#)
- [pab](#) (12%) [exclude](#)

Host Specy

- [mouse](#) (74%) [exclude](#)
- [rat](#) (11%) [exclude](#)
- [rabbit](#) (8%) [exclude](#)
- [chicken](#) (2%) [exclude](#)
- [goat](#) (2%) [exclude](#)
- [hamster](#) (0.6%) [exclude](#)
- [human](#) (0.4%) [exclude](#)
- [sheep](#) (0.2%) [exclude](#)
- [horse](#) (0.1%) [exclude](#)
- [equine](#) (0.1%) [exclude](#)

Species Reactivity

- [human](#) (63%) [exclude](#)
- [mouse](#) (21%) [exclude](#)
- [rat](#) (8%) [exclude](#)
- [monkey](#) (2%) [exclude](#)
- [virus](#) (0.7%) [exclude](#)
- [yeast](#) (0.5%) [exclude](#)
- [fish](#) (0.3%) [exclude](#)
- [bovine](#) (0.2%) [exclude](#)
- [pig](#) (0.1%) [exclude](#)
- [rabbit](#) (0.1%) [exclude](#)
- [drosophila](#) (0.1%) [exclude](#)
- [sheep](#) (0.1%) [exclude](#)
- [xenopus laevis](#) (0.1%) [exclude](#)
- [goat](#) (0.1%) [exclude](#)
- [mammals](#) (0.1%) [exclude](#)
- [dog](#) (0.1%) [exclude](#)
- [salmonella](#) (0.1%) [exclude](#)
- [vertebrates](#) (0.1%) [exclude](#)
- [bacteria](#) (0.1%) [exclude](#)
- [insect](#) (0.1%) [exclude](#)

Size

- [100 ug](#) (18%) [exclude](#)
- [1 ml](#) (11%) [exclude](#)
- [100 tests](#) (10%) [exclude](#)
- [0.1 mg](#) (9%) [exclude](#)
- [1 mg](#) (9%) [exclude](#)
- [200 ug](#) (5%) [exclude](#)
- [100 ul](#) (5%) [exclude](#)
- [500 ug](#) (5%) [exclude](#)
- [500 ul](#) (5%) [exclude](#)
- [0.2 mg](#) (2%) [exclude](#)
- [50 ug](#) (2%) [exclude](#)
- [2 ml](#) (1%) [exclude](#)
- [0.5 ml](#) (1%) [exclude](#)
- [250 ul](#) (1%) [exclude](#)
- [8 ml](#) (1%) [exclude](#)
- [50 tests](#) (1%) [exclude](#)
- [0.5 mg](#) (1%) [exclude](#)
- [0.25 mg](#) (0.9%) [exclude](#)
- [250 ug](#) (0.9%) [exclude](#)
- [0.05 mg](#) (0.8%) [exclude](#)

Recommended Applications

- [FC](#) (28%) [exclude](#)
- [IH](#) (21%) [exclude](#)
- [IF](#) (15%) [exclude](#)
- [IP](#) (14%) [exclude](#)
- [WB](#) (11%) [exclude](#)
- [IC](#) (2%) [exclude](#)
- [IHC](#) (2%) [exclude](#)
- [PS](#) (1%) [exclude](#)
- [FCM](#) (0.8%) [exclude](#)
- [ELISA](#) (0.7%) [exclude](#)
- [RIA](#) (0.5%) [exclude](#)
- [AGG](#) (0.4%) [exclude](#)
- [ID](#) (0.2%) [exclude](#)
- [FS](#) (0.1%) [exclude](#)
- [CT](#) (0.1%) [exclude](#)
- [ICC](#) (0.1%) [exclude](#)
- [IEP](#) (0.1%) [exclude](#)
- [AFFPUR](#) (0.1%) [exclude](#)

Combining Product Info & Research

Critical Need

- Build closer relationship with surgeons
- Overcome objections to medical device products
- Maximize successful outcomes from medical device use

Exalead Solution

- Provide holistic web site resource combining product info, medical research, education resources, event notification
- Combine multiple information sources using semantic extraction to combine and distill information

Combining Product Info & Research

 North America

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mandible fracture

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Source

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» [Conventional screw \(3\)](#) x

» [Articular fracture, split-depression \(1\)](#) x

» [Complete articular fracture \(1\)](#) x

» [Ankylosis \(2\)](#) x

» [Articular fracture, pure depression \(1\)](#) x

» [Articular fracture, pure split \(1\)](#) x

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» [text/html \(57\)](#) x

Language

» [English \(57\)](#) x

Related Popular Searches:

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February 10 2010: ...Fractures where fragments involve the posterior third of the orbit are susceptible to subsequent optic nerve disorders...



March 2 2010: ... small plates used to simplify the fracture may be removed after the reconstruction plate has been attached to the mandible...



January 31 2010: ...preoperative imaging is essential to assess whether single or multiple fracture patterns are present and to provide adequate...



January 27 2010: ...applies to more difficult fracture patterns such as comminuted, atrophic, and defect fractures in order to allow optimal manipulation...



January 23 2010: lingual surface of the mandible to assure optimal reduction of the fracture in this region ...



January 23 2010: ... teeth in the line of the fracture, there are two surgical approaches...

Related Resident Textbooks



[AO Manual of Fracture Management - Minimally Invasive Plate Osteosynthesis \(MIPO\)](#)
5070



[Planning & Reduction Technique in Fracture Surgery](#)
5102

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[Fixation of a Transverse Fracture of the Mandibular Angle with a 2.0 Mandible Locking Plate on the Oblique Ridge](#)

[Fixation of a Transverse Fracture of the Mandibular Angle with a 2.0 Mandible Locking Plate on the Oblique Ridge \(with skin\)](#)

[Fixation of a Comminuted Fracture of the Lateral Body of the Mandible with a 2.4 Locking Reconstruction Plate following Simplification with 2.0 Adaption Plates](#)

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Effect Intelligence

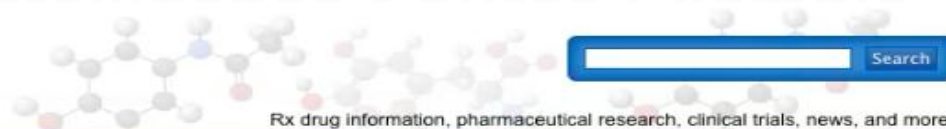
Critical Need

- Gain 360 degree view of drug use outcomes
- Find all known adverse effect reports
- Understand doctor sentiment regarding specific drugs
- Find research and results on related topics

Exalead Solution

- Provide semantically integrated dashboard that combines results from internal data and Web
- Combine multiple information sources using semantic extraction to distill information
- Find research on related drugs

Drug Effect Intelligence Source Example



Rx drug information, pharmaceutical research, clinical trials, news, and more

Drugs by Name

Drugs by Condition

Drugs by Category

Most Searched

Ratings/Reviews

Actives

Alerts

Adverse Events

Spiriva (Tiotropium Inhalation) - Adverse Event Reports - Death - Respiratory Failure

Spiriva Rx

Summary

Description and
Clinical Pharmacology

Indications and Dosage

Warnings and
Precautions

Side Effects and
Adverse Reactions

Drug Interactions,
Overdosage and
Contraindications

Other Rx Information

Adverse Event Reports

User Ratings / Reviews

[Index of reports](#) > [Cases resulting in death \(88\)](#) > Cases with Respiratory Failure (8)

Below is the selection of adverse event reports related to Spiriva (Tiotropium Inhalation) that includes cases resulting in death where reactions include respiratory failure.

Adverse event in male receiving Spiriva (Tiotropium Inhalation)

Reported by a physician from Japan on 2007-10-31

Patient: male, weighing 55.3 kg (121.7 pounds)

Adverse reactions / side effects: Respiratory Failure, Ileus Paralytic

Adverse event resulted in: death, life threatening event, hospitalization

Suspect drug(s):

Spiriva (Tiotropium Inhalation)

Other drugs received by patient: Adalat; Famotidine; Nitroderm; Qvar 40

Adverse event in male receiving Spiriva (Tiotropium Inhalation)

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COPD treatment
pulmonary rehab to
feel better NOW

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Learn 3 Effective
Steps For Relief Of
Your COPD Symptoms.
Free guide!

www.JohnsHopkinsHealthAlert

Control Your Asthma Now

Visit State-Of-Art

Drug Effect Intelligence

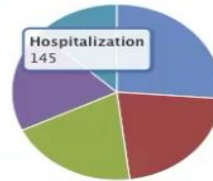
- Disability - Visual Acuity Reduced
- Death - Respiratory Failure
- Other Serious Reactions - Chest Pain
- Other Serious Reactions - Drug Ineffective
- Other Serious Reactions - Dyspnoea
- Other Serious Reactions
- Disability - Dyspnoea
- Disability - Disability
- Disability
- Hospitalization - Chronic Obstructive

1 2 3 4 5 6

Sales visits activities for spiriva

Number of v
15000

Adverse effect type



DateRating

NoRating Positive
Neutral Negative

1076 blogs and documents for spiriva

Spiriva (Tiotropium Inhalation) - Current Clinical Trials

text: Effect of **Spiriva** on the Activities of Daily Living Score Recommended in Austrian COPD Guidelines ... Pilot Study Comparing **Tiotropium (Spiriva)** to Salmeterol (Serevent) Plus Fluticasone (Flixotide) in COPD ... Effect of **Tiotropium (Spiriva)** on Exercise Tolerance in COPD Patients

Spiriva (Tiotropium Inhalation) - Published Studies

text: Well-designed clinical trials related to **Spiriva** (Tiotropium Inhalation ... Efficacy of tiotropium bromide (**Spiriva**) in patients with chronic-obstructive pulmonary disease (COPD) of different severities ... Other research related to Spiriva (Tiotropium Inhalation) Additive role of tiotropium in severe asthmatics and Arg16Gly in ADRB2 as a potential marker to predict response

Spiriva (Tiotropium Inhalation) - News

text: Rx drug information, pharmaceutical research, clinical trials, news, and more **Spiriva** (Tiotropium Bromide Monohydrate Inhalation) - News ... News related to **Spiriva** (Tiotropium Inhalation) and/or conditions it is approved for ... Rx drug information, pharmaceutical research, clinical trials, news, and more Drugs by Name Drugs by Condition Drugs by Category Most Searched Ratings/Reviews Actives Alerts Adverse **Events** Spiriva (Tiotropium Bromide Monohydrate Inhalation) - News Spiriva Rx

Spiriva (Tiotropium Inhalation) - Reviews, Ratings, Comments by Patients

text: Based on a total of 1 ratings/reviews, **Spiriva** has an overall score of 9 ... **Spiriva** review by 57 year old female patient Rating Overall rating: Effectiveness: Highly Effective Side effects: No Side Effects Treatment Info Condition / reason: Asthma Dosage & duration: 1 puff (dosage frequency: bid) for the period of current Other conditions: Bronchitis Other drugs taken: Symbicort Reported Results Benefits: I used to live on my MDI(combivent ... I started

Spiriva (Tiotropium Inhalation) - Reports of Side Effects and Adverse Reactions

text: Adverse event in female receiving **Spiriva** (Tiotropium Inhalation) Reported by a consumer/non-health professional from United States on 2007-10-31 Patient: female Adverse reactions / side effects: Incorrect Route of Drug Administration Suspect drug(s): **Spiriva** (Tiotropium Inhalation) Adverse event in male receiving **Spiriva** (Tiotropium Inhalation) Reported by a

Narrow your search

Related Terms

- » Advair Diskus (351) x
- » Selection Of Adverse Event Reports (629) x
- » Index Of Reports (629) x
- » User Ratings (597) x
- » Back Pain (216) x
- » Abdominal Pain (202) x
- » Active Ingredients (531) x
- » Event In Male (504) x
- » Tiotropium Inhalation (226) x
- » Renal Failure (166) x

Source

- » DrugLib (962) x
- » BOEHRINGER-INGELHEIM (93) x
- » Cafepharma (18) x
- » Pharma Marketing (3) x

Drugs

- » Spiriva (1076) x
- » Aspirin (466) x
- » Albuterol (360) x
- » Lasix (357) x
- » Advair Diskus (347) x
- » Tiotropium (339) x
- » Prednisone (318) x

Management Problems Solved by SBA

- ▶ Lower TCO than RDB or other search technology
- ▶ Safer – Robust, Secure, Embeddable
- ▶ Faster – Within-the-quarter use and results
- ▶ Easier – Appropriate architecture yields cascading simplicity, agility, deployment speed and quality

- Search engines can handle the semantics of databases (but not the transactions)
- Facets are semantic dimensions
- Semantics allows for « business intelligence » type reporting
- Search Based Applications use the power of search engines (intuitive, scaling, agility) to extract and merge information from databases and text



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Authors: Gregory Grefenstette & Laura Wilber, [3DS Exalead, S.A.](#)



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