

# Knowbel – EarlyTracks

*S<sup>2</sup>E – Semantic Search Engine*



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# Knowbel – Earlytracks

## About us

Knowbel – Earlytracks combines the strength of two worlds :

- ▶ Knowbel Technologies, university Spin-Off
  - ▶ Origin: 10 years of research in Natural Language Processing
  - ▶ Main focus: medical & media
- ▶ Earlytracks, ventured back Start-Up
  - ▶ Origin: professional of both finance and entrepreneurship
  - ▶ Main focus: corporate finance & media

Mid-2012, Knowbel – Earlytracks decided to merge their activities. Since then, they moved to a fully commercial company.

# Knowbel – Earlytracks

## Core business

«**Text Mining** is the discovery by computer of new, previously unknown information, by automatically extracting information from different written resources. A key element is the linking together of the extracted information together to form new facts or new hypotheses to be explored further by more conventional means of experimentation.» (Hearst, 2003)

- ▶ **Three main domains:** medical, media & corporate finance
- ▶ **Two main applications:**
  - ▶ Pull: the request for a given transaction is initiated by the receiver (*i.e. search engine*)
  - ▶ Push: the request for a given transaction is initiated by the publisher (*i.e. survey engine*)

# Our approach

## The goal behind

The screenshot shows a Google search for "marie curie" in a browser window. The search results include several links to Wikipedia, Cancer Care, Biography, and Actions. A knowledge panel on the right provides a summary of Marie Curie's life, including her birth and death dates, her discoveries, education, awards, and children.

**marie curie - Google Search - Iceweasel**

File Edit View History Bookmarks Tools Help

marie curie - Google Search

+You Search Images Maps Play YouTube News Gmail Drive Calendar More

Google marie curie Sign in

Web Images Maps Shopping News More Search tools

About 16,400,000 results (0.41 seconds)

**Marie Curie - Wikipedia, the free encyclopedia**  
[en.wikipedia.org/wiki/Marie\\_Curie](http://en.wikipedia.org/wiki/Marie_Curie)  
 Marie Skłodowska-Curie, often referred to as **Marie Curie**, (7 November 1867 – 4 July 1934) was a Polish physicist and chemist, working mainly in France, who ...  
[Irene Joliot-Curie](#) - [Aplastic anemia](#) - [Pierre Curie](#) - [Panthéon](#)

**Marie Curie Cancer Care**  
[www.mariecurie.org.uk/](http://www.mariecurie.org.uk/)  
**Marie Curie Cancer Care** provides end of life care to terminally ill patients in their own homes, or in one of our nine hospices.

**Marie Curie - Biography**  
[www.nobelprize.org](http://www.nobelprize.org) > [Nobel Prizes](#) > [Nobel Prize in Physics](#)  
 Short profile from the foundation that awards the Nobel Prize.

**Marie Curie Actions - European Commission**  
[ec.europa.eu](http://ec.europa.eu) > ... > [Research & Innovation](#)  
 Dec 3, 2007  
**Marie Curie Actions:** European research fellowships/grants for researchers regardless of nationality ...

More videos for **marie curie** >

**Marie Curie Biography - Facts, Birthday, Life Story - Biography.com**  
[www.biography.com](http://www.biography.com) > [People](#)  
 Explore the scientific mind of **Marie Curie**, two-time Nobel Prize winner whose work led to the discovery of radioactivity. Learn more on Biography.com.

**Marie Curie and The Science of Radioactivity**

**Marie Curie**

Marie Skłodowska-Curie, often referred to as Marie Curie, was a Polish physicist and chemist, working mainly in France, who is famous for her pioneering research on radioactivity. [Wikipedia](#)

**Born:** November 7, 1867, [Warsaw](#)

**Died:** July 4, 1934, [Sancelmeoz](#)

**Discovered:** [Polonium](#), [Radium](#)

**Education:** [University of Paris \(1903\)](#), [University of Paris \(1894\)](#), [University of Paris \(1891 – 1893\)](#)

**Awards:** [Nobel Prize in Physics](#), [Nobel Prize in Chemistry](#), [Elliott Cresson Medal](#), [Day Medal](#), [Matteucci Medal](#), [John Scott Award](#)

**Children:** [Irene Joliot-Curie](#), [Eve Curie](#)

# Our approach

## Why not an ontology?

An ontology is constrained by:

- ▶ complexity of the domain
- ▶ stability of the domain
- ▶ homogeneity of the domain

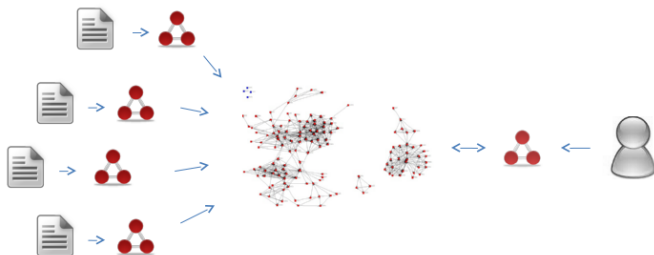
→ Solution: divide into sub-domain?

Not really... risk of semantic heterogeneity!

- ▶ logical interpretations
- ▶ structural representation
- ▶ naming and format specification

# Our approach

## A bottom-up design



# Our approach

## Two-level indexation

### Go beyond the words

#### ► Text Level

- Multiword units: several words, one meaning

EN: chief executive officer, net income, ...

FR: chambre des représentants, commission d'enquête parlementaire, ...

#### ► Semantic Level

- Named-Entities: predefined domain categories

Health Care: drugs, diseases, vital signs, ...

Finance: companies, persons, market index, ...

- Events: set of relationships linking one or more entities

Biography: weddings, professions, death, ...

Finance: bankruptcy, joint ventures, acquisition, ...



# Technical functionalities

## Content enrichment (1)

The screenshot displays the eXabyte search engine interface. The browser window title is "eXabyte - Search Engine for Professionals - iceweasel". The page features a navigation menu with "HOME", "ABOUT", and "CONTACT". A search bar contains the text "eXabyte - Search Engine for Prof...".

On the left side, there is a sidebar with a logo and several sections for filtering and enrichment:

- ENTITIES:** PLACE, ORGANISATION, TIME, PROFESSION, PEOPLE.
- EVENTS:** EMPLOYMENT – CHANGE, MERGER, REORGANIZATION, EMPTY.
- EMPLOYMENT:** PERSON: Ruud Joosten, PROFESSION: CEO, COMPANY: Decorative Paints.
- MERGER:** PERSON: Tax Gunning, PROFESSION: CEO, COMPANY: Vador.
- REORGANIZATION:** REORG\_COMPANY: Decorative Paints, LOCATION: North America.

The main content area shows a news article snippet with the following text:

(PR) AkzoNobel announces new leadership for Decorative Paints. Today, AkzoNobel announced that [PERSON: Ruud Joosten] will be appointed [PROFESSION: CEO] of [COMPANY: Decorative Paints] with effect from the Annual General Meeting (AGM) on April 26. He will succeed Tax Gunning, Member of the Board of Management, who will step down and retire. Ruud Joosten is currently Managing Director of Pulp and Performance Chemicals within the Specialty Chemicals Business Area. Ruud Joosten has extensive experience in Decorative Paints and has been responsible for both mature and high growth regions. In his most recent role, he managed a truly global business in the Specialty Chemicals Business Area. In his new assignment, he will concentrate on adapting Decorative Paints Europe to the challenging market environment and on further expanding Decorative Paints' presence in key growth markets. "The future of Decorative Paints is in very good hands. Ruud is a highly competent manager with a strong track record throughout the organization. On behalf of the Executive Committee, I [wish,wish.V:P1sP2s] Ruud every success in his new role," said Ton B uchner, CEO of AkzoNobel. "I would also like to thank Tax for his excellent service to the company and wish him a happy retirement." Tax Gunning's business career spanned over 25 years in Unilever, lastly as Business Group President. In September 2007, [PERSON: Tax Gunning] was appointed [PROFESSION: CEO] of [COMPANY: Vador], a global company in HRM services. After a successful merger with [PARTNER: Randstad], he joined AkzoNobel in 2009. During his tenure at AkzoNobel, Tax Gunning played a crucial role in the integration of ICI's paints activities into the AkzoNobel organization, resulting in substantial synergy savings. He oversaw the turnaround of [REORG\_COMPANY: Decorative Paints] in [LOCATION: North America], substantially [REORG\_COMPANY: Decorative Paints] the European activities and grew the business significantly in

# Technical functionalities

## Content enrichment (2)

eXabyte - Search Engine for Professionals - Iceweasel

File Edit View History Bookmarks Tools Help

eXabyte - Search Engine for Prof...

HOME ABOUT CONTACT

UNDEFINED PEOPLE ORGANISATION PROFESSION PLACE TIME

ENTITIES:

PROFESSIONNEL

ORGANISATION

TIME

PLACE

PEOPLE

EVENTS:

APPELER [ AU ]

PEOPLE: Abou Moussab Abdel Wadoud  
PEOPLE: Zine El Abidine Ben Ali  
UNDEFINED: renversement  
ORGANISATION: service américain de surveillance des sites islamistes

SOUTENIR

ORGANISATION: Al - Qaïda  
UNDEFINED: manifestations  
PLACE: Tunisie

IS A

PEOPLE: Abou Moussab Abdel Wadoud  
UNDEFINED: leader  
ORGANISATION: Al - Qaïda au Maghreb islamique

PEOPLE: Zine El Abidine Ben Ali  
PROFESSION: président

PEOPLE: Abou Moussab Abdel Wadoud  
PROFESSION: chef  
ORGANISATION: Aqmi

(B) [ORG Al - Qaïda] soutient les [UNDEFINED manifestations] en [PLACE Tunisie]. [PEOPLE Abou Moussab Abdel Wadoud], le [UNDEFINED leader] d'[ORG Al - Qaïda au Maghreb islamique], appelle au [UNDEFINED renversement] du [PROF président] tunisien [PEOPLE Zine El Abidine Ben Ali], selon le [ORG service américain de surveillance des sites islamistes]. Dans une vidéo de 13 minutes, le [PROF chef] d'[ORG Aqmi], [PEOPLE Abou Moussab Abdel Wadoud], s'adresse aux contestataires, qui manifestent depuis un mois, de " nous envoyer leurs fils en Irak qu' ils reçoivent un entraînement militaire ", a rapporté SITE. " Nous vous offrons notre soutien et notre réconfort ainsi que notre aide dans votre détresse et votre exil ", a déclaré le dirigeant islamiste. Abou Moussab Abdel Wadoud a appelé les Tunisiens à se soulever dans tout le pays contre " le régime corrompu, criminel et tyrannique " en place à Tunis et à établir la charia. " Nous exercerons tôt ou tard des représailles contre vos tortionnaires et leurs maîtres ", a-t-il menacé. Des affrontements brutiers entre manifestants et forces de sécurité ont eu lieu jeudi à Tunis et sa banlieue dans le cadre d' un mouvement sans précédent de contestation du régime qui a fait 66 morts en un mois selon une ONG des droits de l' homme.

# Technical functionalities

## Content structuration (1)

eXabyte - Search Engine for Text: Professionnels - Mozilla Firefox

File Edit View History Bookmarks Tools Help

eXabyte - Search Engine for Text...

HOME ABOUT CONTACT

**BETTINO CRAXI**

"Bettino Craxi, de son vrai nom Benedetto Craxi, était un homme politique italien, né à Milan, le 24 février 1934, mort à Hammamet le 19 janvier 2000."

ETAT CIVIL

CARRIÈRE

PROFESSION **Fonction:** président  
**Date:** entre 1983 et 1987

PROFESSION **Fonction:** député  
**Date:** de 1968 à 1992

PROFESSION **Fonction:** secrétaire général

PROFESSION **Fonction:** premier dirigeant socialiste

PROFESSION **Fonction:** représentant personnel  
**Organisation:** ONU

PROFESSION **Fonction:** roi déchu

PROFESSION **Fonction:** ancien chef de gouvernement

JUSTICE

DIVERS

BROWSE CONNECTIONS

The network diagram illustrates Bettino Craxi's connections to other prominent figures. Bettino Craxi is the central node, highlighted in red. He is connected to several other nodes, including Giuseppe Pisani, Walter Veltroni, Gianfranco Fini, and Silvio Berlusconi. Other nodes include Romano Prodi, Robert Hersant, Mariotti, Leonardo Mondadori, Anna Maria Tato, Francesco Rosi, Giacomo Strehler, Jean-Paul II, Claude Akins, ALTADENA, Alessio Adamovitch, Severino Citaristi, and Dan Quayle. The nodes are color-coded: Bettino Craxi is red, while others are blue or green.

Done

# Technical functionalities

## Content structuration (2)

The screenshot displays the Earlytracks application interface. At the top, there is a navigation bar with 'RENAULT', 'TOP 10', and 'SCREENER' tabs. A search bar contains the text 'Search company'. Below the navigation, the main content area is titled 'Renault' and shows '110 articles / day'. It lists 'Subsidiary' (Industrija motornih vozila (0)), 'Competitors' (Ford Motor Company (644), Renault (409), General Motors (353)), 'Linked companies' (PEUGEOT SA (184), Kia Motors (79), Bayerische Motoren Werke AG (67)), and 'Linked person' (Xavier Huillard (15)). A line chart shows sentiment trends. Below the chart, a list of news articles is displayed, each with a source, category, date, and sentiment score.

Article Title	Source	Category	Date	Rating	Positiveness
Renault hace un balance "positivo" de las ventas en España en 2012	<a href="http://www.leonoticias.com">http://www.leonoticias.com</a>	Business Finance	02/01/2013 ES	●○○○○	50%
Renault annonce une "reconquête" du marché français en 2013	<a href="http://www.easybourse.com">http://www.easybourse.com</a>	Business Finance	02/01/2013 FR	●●●○○	84%
Renault : une année 2012 à oublier en France !	<a href="http://www.trader-financ.e.fr">http://www.trader-financ.e.fr</a>	Business Finance	02/01/2013 FR	●●●○○	50%
RENAULT : Le constructeur français optimiste pour 2013	<a href="http://www.tradingsat.com">http://www.tradingsat.com</a>	Business Finance	02/01/2013 FR	●●●○○	50%
2012, année noire pour le marché automobile français	<a href="http://www.easybourse.com">http://www.easybourse.com</a>	Business Finance	02/01/2013 FR	●●●○○	50%

# Technical functionalities

## Content contextualization (1)

S<sup>3</sup> - Search Engine - Iceweasel

S<sup>3</sup> - Search Engine

192.168.1.4:3000

Google

S<sup>3</sup> - Semantic Search Solution

### 20794870-fr.txt


**Justine Henin** en **Tia Hellebaut** marraines des nouveaux navires de la société DEME +PIX **Justine Henin** et **Tia Hellebaut** ont baptisé **vendredi à Zeebrugge** les deux nouveaux bateaux de la société de dragage DEME en présence du **ministre des Finances Didier Reynders**. **L'ancienne numéro n°1** du **tennis mondial** est ainsi devenue la marraine du **"Congo River"**, une drague aspiratrice et nouveau vaisseau amiral de la société. L'ancienne championne de saut en hauteur est devenue, quant à elle, la marraine du "Flintstone" qui peut déverser des blocs de pierre jusqu'à 2.000 **mètres de profondeur**.

**Filters:**


Entities:

Person ▼ Place ▼ Profession ▼ Time ▼ Multiword ▼

Search:

 ZEEBRUGGE, BELGIUM: (L-R) CEO of DEME Alain Bernard, Annemie Vandepuit, Didier Reynders (MR), Tia Hellebaut and Justine Henin pictured during the christening of the new flagship "Congo River" of the DEME fleet and the DP2 fall pipe vessel "Flintstone" with tennis player Justine Henin and athlete Tia Hellebaut in the harbor of Zeebrugge, Friday 08 July 2011. BELGA PHOTO KURT DESPLENTER

Score: 4.9247284

 ZEEBRUGGE, BELGIUM: (L-R) CEO of DEME Alain Bernard, Annemie Vandepuit, Didier Reynders (MR), Tia Hellebaut and Justine Henin pictured during the christening of the new flagship "Congo River" of the DEME fleet and the DP2 fall pipe vessel "Flintstone" with tennis player Justine Henin and athlete Tia Hellebaut in the harbor of Zeebrugge, Friday 08 July 2011. BELGA PHOTO KURT DESPLENTER

Score: 4.9247284

Navigation icons: back, forward, home, search, refresh, print, zoom, etc.

# Technical functionalities

## Content contextualization (2)

The screenshot displays the Earlytracks interface for 'APPLE INC.'. The browser window title is '- Earlytracks - Iceweasel'. The page includes a search bar and navigation tabs for 'APPLE INC.', 'TOP 10', and 'SCREENER'. A search bar contains the text 'Search company'.

**Apple Inc.** 250 articles / day

**Key People**  
 Al Gore (284) Eric E. Schmidt (253) Steve Jobs (124)

**Subsidiaries**  
 Power Computing (0) Quattro Wireless (0)

**Competitors**  
 Nokia (249) Motorola (107) Research In Motion (1)

**Linked companies**  
 Google (207) Samsung C&T (157) Microsoft (137)

**Linked people**  
 Timothy D. Cook (54) Steve Jobs (54) Angela Merkel (18)

**News Feed:**

- 50 million Android and iOS devices activated in last week of...** 02/01/2013 EN  
 Source: [www.yahoo.com](http://www.yahoo.com) Rating source: ●○○○○  
 Category: **Technology Internet** Positiveness: 50% [more](#)
- 2012's final week saw record-smashing device activations, app downloads 03/01/2013
- 50 million Android and iOS devices activated in last week of December alone 02/01/2013
- Record-breaking Christmas week: 50M iOS and Android devices activated, ... 02/01/2013
- App downloads smash records at 1.76 billion in one week during the holidays 02/01/2013
- Tablet, Smartphone Activations Soared on Christmas 03/01/2013
- Record iOS, Android app downloads tallied in last week of 2012 02/01/2013
- A very techy Christmas: 50 million new phones and tablets activated 02/01/2013
- Record Number of New-Smartphone Activations Over Holidays 03/01/2013
- App downloads hit new record in holiday 2012 03/01/2013
- App downloads hit record 1.76 billion over holiday week 02/01/2013
- The New Norm: Expect App Downloads to Regularly Hit One Billion a Week 02/01/2013
- Holiday Week 2012 Sees New iOS And Android Device Activations Rise To... 02/01/2013
- Record Breaking 50 Million iOS and Android Devices Activated, 1.76... 03/01/2013
- Healthy Download Rates for Apps 02/01/2013
- Christmas Day: tablet activations outpace smartphones 28/12/2012
- December sets new world record for smartphone and tablet activation 02/01/2013
- Record iOS, Android App Downloads Tallied In Last Week Of 2012 - Comm... 03/01/2013

# Application to the media industry

## ▶ Editorialism

- ▶ concurrence survey (news not covered, ...)
- ▶ identification of plagiarism
- ▶ contextualization (pictures, videos, archives, ...)
- ▶ ....

## ▶ User side

- ▶ transparent query expansion
- ▶ vertical search (facet browsing, ...)
- ▶ profiling (dynamic portal, ...)
- ▶ ...

→ Main interests are:

- ▶ real-time update
- ▶ certified information